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New SmartTrack Stations

Environmental Project Report

Volume VII - St. Clair-Old Weston Smart Track Station

July 2018 Revision 0

TORONTO METROLINX 4TRANSIT PARSONS HATCH WSP

New SmartTrack Stations - EPR Volume VII - St. Clair-Old Weston SmartTrack Station

Issue and Revision Record					
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	Signatures:				

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Glossary of Acronyms and Terms

Acronym / Term	Definition
AA	Archaeological Assessment
AAQC	Ambient Air Quality Criteria
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
ANSI	Areas of Natural and Scientific Interest
AQIA	Air Quality Impact Assessment
BHR	Built Heritage Resource
BMP	Best Management Practices
CAAQS	Canadian Ambient Air Quality Standards
CEAA	*Canadian Environmental Assessment Act*
CFIA	Canadian Food Inspection Agency
CHAR	Cultural Heritage Assessment Report
CHER	Cultural Heritage Evaluation Report
CHL	Cultural Heritage Landscapes
CHR	Cultural Heritage Resources
CHSR	Cultural Heritage Screening Report
CHVI	Cultural Heritage Value or Interest
CN/CNR	Canadian National Railway
COC	Contaminants of Concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSSARO	Committee on the Status of Species at Risk in Ontario
CP/CPR	Canadian Pacific Railway
CPTED	Crime Prevention Through Environmental Design
CSP	Corrugated Steel Pipe
CTC	Credit Valley, Toronto and Region and Central Lake Ontario
CTMP	Construction Traffic Management Plan
DBH	Diameter at Breast Height
DFO	Fisheries and Oceans Canada
DVP	Don Valley Parkway
EA	Environmental Assessment
EAA	*Environmental Assessment Act*
EAB	Emerald Ash Borer
EASR	Environmental Activity and Sector Registry
EBA	Event Based Area
ECA	Environmental Compliance Approval
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
EMMP	Environmental Mitigation and Monitoring Plan
EPR	Environmental Project Report
ESA	*Endangered Species Act*

Acronym / Term	Definition
ESC	Erosion and Sediment Control
ESR	Environmental Study Report
FTA	United States Federal Transit Administration
FWCA	*Fish and Wildlife Conservation Act*
GEXR	Goderich-Exeter Railway
GFA	Gross Floor Area
GHG	Greenhouse Gas
GIN	Groundwater Information Network
GTA	Greater Toronto Area
GTS	Georgetown South
HCM	Highway Capacity Manual
HIA	Heritage Impact Assessment
IBC	Initial Business Case
IPD	Initial Preferred Design
ISA	International Society of Arboriculture
LIO	Land Information Ontario
LOS	Level of Service
LRT	Light Rail Transit
masl	Metres Above Sea Level
MBCA	*Migratory Birds Convention Act*
mbgs	Metres Below Ground Surface
MNDM	Ministry of Northern Development and Mines
MNRF	Ministry of Natural Resources and Forestry
MOE	Ministry of Environment (now Ministry of the Environment and Climate Change)
MOECC	Ministry of the Environment and Climate Change
MOEE	Ministry of Environment and Energy (now Ministry of the Environment and Climate Change)
MOVES	Motor Vehicle Emission Simulator
MTCS	Ministry of Tourism, Culture and Sport
MTO	Ministry of Transportation
MUP	Multi-use Path
N/A	Not Applicable
NAPS	National Air Pollution Surveillance
NHIC	Natural Heritage Information Centre
NHS	Natural Heritage System
NPC	Noise Pollution Control
NPV	Net Present Value
NSA	Noise Sensitive Area
O. Reg.	Ontario Regulation
OBBA	Ontario Breeding Bird Atlas
OCS	Overhead Contact System

Acronym / Term	Definition
OHA	*Ontario Heritage Act*
OHT	Ontario Heritage Trust
OMB	Ontario Municipal Board
OPSS	Ontario Provincial Standard Specification
OTM	Ontario Traffic Manual
OWRA	*Ontario Water Resources Act*
PDBC	Preliminary Design Business Case
PHF	Peak Hour Factors
PHP	Provincial Heritage Properties
PPS	Provincial Policy Statement
PPUDO	Passenger Pick-up and Drop-off
PPV	Peak Particle Velocity
The Protocol	Ministry of Environment and Energy (now MOECC)/GO Transit Draft Protocol for Noise and Vibration Assessment
PSW	Provincially Significant Wetland
PTE	Permission to Enter
RCD	Reference Concept Design
RER	Regional Express Rail
RMS	Root-Mean-Square
RMSV	Root-Mean-Square Velocity
RNFP	Ravine and Natural Feature Protection
ROW	Right-of-Way
RTPC	Regional Transportation Passenger Centre
S&G	Standards and Guidelines
SAR	Species at Risk
SARA	*Species at Risk Act*
SCC	Species of Conservation Concern
SSE	Scarborough Subway Extension
SUE	Subsurface Utility Engineering
SWH	Significant Wildlife Habitat
SWHTG	Significant Wildlife Habitat Technical Guide
TAC	Technical Advisory Committee
TIP	Tree Inventory Plan
TIS	Traffic Impact Studies
TLI	Temporary Limited Interest
TMC	Turning Movement Counts
TMP	Transportation Master Plan
TPAP	Transit Project Assessment Process
TPSS	Traction Power Substation
TPZ	Tree Protection Zone
The Transit Project	New SmartTrack Stations Project

Acronym / Term	Definition
TRCA	Toronto and Region Conservation Authority
TSMP	Transportation Servicing Master Plan
TSP	Total Suspended Particles
TTC	Toronto Transit Commission
TTIS	Transportation and Traffic Impact Study
TTS	Transportation Tomorrow Survey
US EPA	United States Environmental Protection Agency
v/c ratio	Volume-to-Capacity Ratio
VKT	Vehicle Kilometres Travelled
WTRP	West Toronto Railpath
ZOI	Zone of Influence

1. Introduction

Metrolinx, an agency of the Province of Ontario, and the City of Toronto have proposed the development of a new rail station on the Kitchener rail corridor within the City of Toronto as part of the New SmartTrack Stations Project (the Transit Project). The St. Clair-Old Weston SmartTrack Station (the Project) will be located on the Kitchener rail corridor west of the intersection of St. Clair Avenue West and Old Weston Road in the City of Toronto.

The study area for the Project is discussed in Section 1.1. Further details regarding the design of the Project are provided in Section 2.

Metrolinx and the City of Toronto are evaluating the potential environmental effects of the Transit Project in accordance with the Transit Project Assessment Process (TPAP). The TPAP is a streamlined environmental assessment (EA) process that recognizes and addresses the predictable environmental effects of transit projects and is approved under the *Environmental Assessment Act* (EAA) through Ontario Regulation 231/08 - Transit Projects and Metrolinx Undertakings (O. Reg. 231/08). This Environmental Project Report (EPR) documents the TPAP for the Transit Project and has been prepared in accordance with the *Guide to Ontario's Transit Project Assessment Process* (MOECC, 2014) as detailed in Volume 1 of this EPR.

Volume 9 of the EPR documents the consultation program followed for the Transit Project.

1.1 Description of Study Area

1.1.1 Kitchener Rail Corridor

Figure 1-1 shows the Kitchener rail corridor[1] with the existing/proposed GO stations and proposed SmartTrack stations.

The Kitchener rail corridor is owned by Metrolinx and Canadian National Railway (CNR). Metrolinx owns the Weston and Guelph Subdivisions whereas CNR owns the Halton Subdivision. The Canadian Pacific Railway (CPR) MacTier Subdivision runs parallel and east of a section of the Weston Subdivision within the study area. Metrolinx operates a commuter (passenger) rail service along the Weston, Halton and Guelph Subdivisions, from Union Station in the City of Toronto to Kitchener GO Station in the City of Kitchener. The UP Express line spurs off to become the Pearson Subdivision connecting the Kitchener rail corridor to the Toronto Pearson International Airport in the City of Mississauga. VIA passenger trains travel along the Kitchener rail corridor between Toronto and London. Oriented generally in an east-west direction, the existing Kitchener rail corridor includes three tracks between Strachan Avenue and Highway 427. Between Highway 427 and Kitchener GO Station, there are alternately two and three tracks along the corridor. An additional, fourth track is currently under construction along the corridor in the study area. The corridor is approximately 166 km in length and includes 11 stations (excluding Union Station). The Kitchener rail corridor runs through the City of Toronto, the City of Mississauga and City of Brampton (both in Peel Region), Town of Halton Hills (Halton Region), City of Guelph (Wellington County), the Township of Woolwich and City of Kitchener (both in Waterloo

[1] Up until December 19, 2011, this rail corridor was known as the Georgetown rail corridor.

Region). Metrolinx accommodates CP freight operations within Metrolinx owned portions of the Lower Galt Subdivision based on Trackage Rights Agreements.

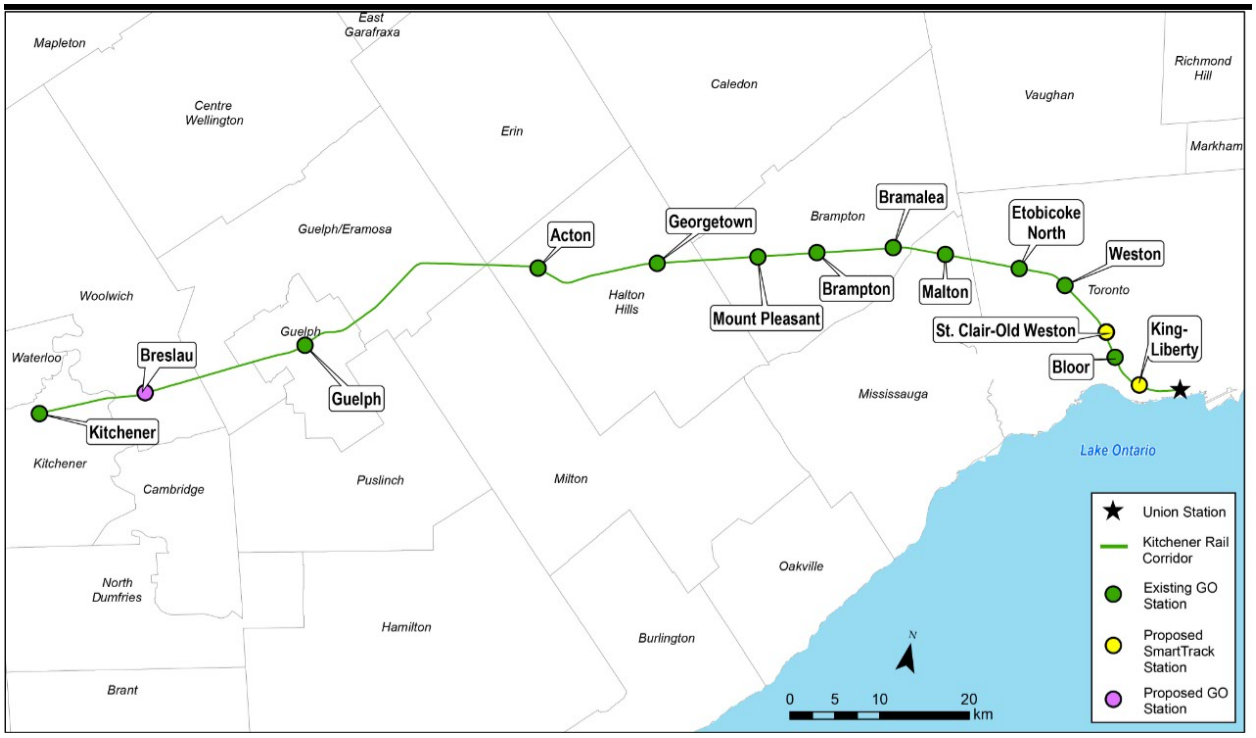

Figure 1-1: Kitchener Rail Corridor

On weekday mornings, there are ten trains on the Kitchener rail corridor travelling towards Union Station between 05:54 and 09:55. These trains stop at all stations except for one train which does not stop at stations between, and including, Malton and Bloor GO Stations. One train begins service at Bramalea GO Station, three trains at Mount Pleasant GO Station, two trains at Georgetown GO Station, and four trains at Kitchener GO Station. In the opposing direction towards Mount Pleasant GO Station, there are two trains at 08:55 and 09:48 stopping at all stations. Two-way service continues every 60 minutes during the off-peak periods between Mount Pleasant GO Station and Union Station. On weekday evenings, there are two trains from Mount Pleasant GO Station towards Union Station at 15:00 and 15:52 that do not stop between, and including, Etobicoke North and Bloor GO Stations. In the opposing direction towards Kitchener GO Station, there are seven trains between 15:35 and 18:50. These trains stop at all stations except for one train which does not stop at stations between, and including, Bloor and Malton GO Stations. Two trains terminate at Georgetown GO Station, one train at Mount Pleasant GO Station, and four trains at Kitchener GO Station. On weekends, there is no train service between Union Station and Kitchener GO Station.

As detailed in Section 1.2.2, works have been implemented to upgrade infrastructure along the Kitchener rail corridor to help facilitate Regional Express Rail (RER).

In addition to the proposed Project, the Kitchener rail corridor also includes the proposed King-Liberty SmartTrack Station (Volume 6) and the proposed Breslau GO Station in the Township of Woolwich.

1.1.2 *Study Area*

An overall study area was identified for assessment of the potential effects of the Project (Figure 1-2). This study area includes the Project footprint and extends 1 km around the Project footprint. As shown in Table 1-1, environmental study-specific study areas were also identified for assessment of the potential effects of the Project related to each technical discipline being evaluated. These study areas define the geographic extent within which existing environmental conditions are documented and the potential environmental effects of the Project are assessed. The largest of these study areas extends 1 km from the Project footprint. Therefore, the overall study area was set at 1 km to encompass all environmental study-specific study areas. The Project footprint is the area of direct disturbance required for anticipated Project construction and operation activities and represents the anticipated property requirements associated with the Project.

Table 1-1: Study Area by Environmental Study

Study	Study Area
Natural Environment Report	Extends 120 m from the Project footprint[2].
Tree Inventory Plan	Extends 6 m from the Project footprint.
Cultural Heritage Screening Report	The Project footprint and adjacent lands.
Stage 1 Archaeological Assessment	Extends 50 m from the Project footprint.
Socio-Economic and Land Use Study	Extends 500 m from the Project footprint[2].
Air Quality Impact Assessment	Extends 1 km from the Project footprint[2]. Specific receptors are discussed in Section 4.
Noise and Vibration Impact Assessment	Extends 300 m from the Project footprint[2]. Specific receptors are discussed in Section 4.
Transportation Brief	The nearest signalized intersections are discussed in Section 4.

As shown in Figure 1-2, the overall study area extends to the west towards Runnymede Road, extends north beyond Rogers Road, east to Earlscourt Park, and south of Annette Street/Dupont Street.

[2] This technical study was initiated early, using a version of the study footprint that was not final. The differences between the station footprint used in this technical study differs marginally from that shown in Figure 1-2. As the study footprint extended beyond the probable construction boundary the area is valid, and the difference inconsequential. All background information, analysis and assessment documented is comprehensive and covers the entire area where station effects are to be found.

Aerial Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

User Name: p007643C

Legend

- Study Area - 1000
- Proposed Project Footprint (approximate)
- Permanent Watercourse
- Railway

DATA SOURCES:

Roads / Railways - Ontario Open Data Catelogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs

0 125 250 500 Metres

Project:	**New SmartTrack Stations**
Figure Title:	**St.Clair-Old Weston Smart Track Station - Study Area**
Prepared By:	4TRANSIT PARSONS HATCH WSP
Date:	**May 09 2018**
Version: CW.EPR.100-1	TORONTO
Figure:	**1-2**

Document Path: H:\10000s\10568\GIS\Drawings\01-Smart Tracks EPR\10568GIS001110568GIS001_CW.mxd

1.2 Purpose of the Project

1.2.1 Component of Regional Express Rail and SmartTrack

The Project is considered by Metrolinx and the City of Toronto to be of strategic importance to improve local access to higher order rapid transit. It will play a key role in supporting the wider RER and SmartTrack initiatives as a key transit facility in the Toronto downtown area.

1.2.2 Complement to Georgetown South Service Expansion and Union-Pearson Rail Link

Metrolinx completed the *Georgetown South Service Expansion and Union-Pearson Rail Link - Environmental Project Report* (October 2009) (Metrolinx, 2009a) in 2009. The transit infrastructure expansion delivered by the Georgetown South (GTS) Project so far has included modifying/expanding 16 bridges, building seven underpasses/overpasses and a tunnel to remove road rail crossings, and installing close to 60 km of track. Since September 2015, 14 new midday GO train trips on the Kitchener corridor have been added between Mount Pleasant GO Station and Union Station on weekdays to provide more travel options and flexibility. This more than doubles the GO service that existed prior to the start of the GTS Project in 2010.

The ongoing Kitchener (Georgetown South) rail corridor expansion works, which include installation of a fourth track in the study area for the Project, support the integrated RER and SmartTrack initiatives, including the development of the Project.

1.2.3 St. Clair Avenue West Transportation Master Plan

The City of Toronto is carrying out a Transportation Master Plan (TMP) to examine solutions to improve transportation connections and accessibility in the area around St. Clair Avenue West between Keele Street and Old Weston Road for all road users including cyclists, pedestrians, transit users and vehicles. As part of this TMP, four infrastructure improvements are being recommended to relieve traffic congestion and improve connections for pedestrians and cyclists and access to public transit:

1. Widen St. Clair Avenue West.
2. Extend Gunns Road east to Union Street.
3. Extend Keele Street south to meet the Gunns Road Extension.
4. Extend Davenport Road to Union Street.

The Project is being designed to integrate with these recommended infrastructure improvements.

1.2.4 CP Rail Track Expansion

CP Rail currently has a single mainline track through the study area with the corridor capacity to construct an additional mainline track between the West Toronto Diamond, where the MacTier Subdivision connects to the North Toronto and Galt Subdivisions, and the north end of the joint corridor where the MacTier Subdivision turns north between the Weston GO Station and Etobicoke North GO Station.

1.3 Project Background and Initial Business Case

In July 2016, Metrolinx issued the Initial Business Case (IBC) for the St. Clair-Old Weston SmartTrack Station (previously referred to as St. Clair West), titled *RER New Stations Initial Business Case - St. Clair West (Kitchener) - Kitchener Corridor* (Urban Strategies Inc., 2016).

Following the IBC, the station was recommended by the Metrolinx Board of Directors on June 28, 2016. In Fall 2016, the City of Toronto confirmed the location, general design concept and inclusion of the station in the SmartTrack program. The Metrolinx Board committed to include the station as part of the GO Expansion program procurement on December 8, 2016. Through 2017, Metrolinx engaged with the City and internal stakeholders to refine the IBC station concept plan. Metrolinx and the City worked together to develop the design based on an ongoing operational needs assessment, pre-environmental assessment studies, workshops, discussion, and a technical advisory committee process. Design changes are ongoing in coordination with stakeholders.

Since the Initial Business Case concept illustration (2016), the station design has been modified to:

- Revise the platform arrangement to facilitate anticipated future operating patterns;
- Coordinate with road extensions and bridge widenings identified in the City's St. Clair TMP EA study;
- Enhance pedestrian connections between the station and surrounding area; and
- Enhance connections to the Toronto Transit Commission (TTC) streetcar service on St. Clair Avenue.

1.4 Preliminary Design Business Case

In March 2018, Metrolinx issued the Preliminary Design Business Case (PDBC) for the Project within Appendix I of the New Stations Initial Business Cases Technical Report (Metrolinx, 2018). The PDBC takes the IBC results and refines them with more detailed costing and analysis of benefits. The PDBC analysis captures evolved design concepts, revised modelling methodology, changes in municipal and provincial plans, and updated operating patterns and service plans since 2016. A summary of the business case is provided in Table 1-2.

St. Clair-Old Weston station continues to support existing regional and municipal plans. The station area is targeted for growth and intensification and is undergoing a transformation from an industrial area to a mixed-use neighbourhood with employment uses.

In concert with local transportation improvements, the station will help to provide stronger connections between travel modes and improve walking and cycling access to maximize potential ridership at the station. More direct connections to both the St. Clair streetcar line and the Eglinton Crosstown Light Rail Transit (LRT) via the new Mount Dennis GO station will further increase transit benefits.

Ridership forecasts suggest that the St. Clair-Old Weston station could attract approximately 8,900 daily riders by 2031. The total includes new and existing riders, the latter of which would divert to the new station over their previous location (e.g., Bloor or the future Mount

Dennis stations). The model indicates that relatively few upstream riders are expected to switch to another mode.

The station is located in close proximity to the Stockyards District development and ridership is partially driven by growth and development in the vicinity of the station. Station boardings and alightings are generally concentrated along St. Clair Avenue extending along the streetcar Right-of-Way (ROW) from the Stockyards District in the west to Dufferin Street and beyond in the east. The majority of riders would access the station by walking or transit modes.

Table 1-2: Financial and Economic Summary

	St. Clair-Old Weston
2031 Ridership (AM Peak Period) boardings + alightings	2,300
2031 Ridership (Daily) boardings + alightings	8,900
Change in Cost from IBC	**Increase**
Change in Benefits from IBC	**Increase**
Benefits Compared to Cost	**Benefits are Positive but Less Than Costs**
Transportation User Benefits (60yr lifecycle)	**$89 M**
Travel Time Savings	**$94 M**
Vehicle Operating Cost Savings	**-$3 M**
Decongestion on Road Network	**-$1 M**
Safety Impacts	**$0 M**
Environmental Impacts[3]	**$0 M**

1.5 Full Business Case

As part of Metrolinx's business case analysis approach, Metrolinx staff are currently developing full business cases for all the SmartTrack station sites that underwent a PDBC in March 2018.

2. Project Description

2.1 Initial Preferred Design

Metrolinx and the City of Toronto have sought to refine and update the station concept presented in the IBC. The result of this is the Initial Preferred Design (IPD, October 2017), included in Appendix A. The IPD was used as the basis for evaluation of the Project in the EPR and will be the basis for future work to develop a Reference Concept Design[4] (RCD).

[3] Environmental impacts refer to the broad cost of transport on local surroundings and the Earth's atmosphere. Environmental impacts capture the effect the potential station has on greenhouse gas emissions through reductions in vehicle kilometres travelled.

[4] Reference Concept Designs, or functional designs, are used in the Alternative Financing and Procurement (AFP) model as inputs to the development of the Request for Proposal (RFP) to design and construct the Project. The functional design is intended to identify the location of entrances, exits and ancillary station equipment. Functional designs are not intended to provide architectural details. The AFP partner will be developing detailed designs for the Project and these will be subject to public input.

The Project is conceived to include:

- Two platforms, an island and a side platform;
- Four station access points:
  - On the east side of the rail corridor, a main access near St. Clair Avenue West towards the southern end of the station site, and a secondary access location near the hydro corridor towards the northern end of the station site;
  - On the west side of the rail corridor, station access points at the north and south ends of the side platform;
- Two tunnels with platform accesses;
- A bus loop west of Union Street with five bus bays;
- Para-transit lay-by;
- Bicycle parking; and
- Multi-use Path (MUP) connections to the future Gunns Road extension to the north and St. Clair Avenue West to the south.

This station will not include formal Passenger Pick Up/Drop Off (PPUDO) or parking facilities. Specific station features are described in more detail in Section 2.3.

2.1.1 Design Refinements Subsequent to the Initial Preferred Design

As with any project in the planning phase, refinements may occur as design proceeds. Discipline-specific studies conducted for this EPR Volume based upon the IPD will be reviewed and refined as necessary during detailed design based upon further design refinements. As appropriate, design refinements will be subject to the EPR Addendum process prescribed in O. Reg. 231/08 (see Volume 1).

2.2 Key Design Criteria

The following assumptions guided the development of the IPD:

- Elements of the City's St. Clair Avenue West TMP (approved in a separate Class EA), including:
  - Davenport Road will be extended north across St. Clair Avenue West (via a new bridge) to connect with Union Street at the intersection of Townsley Street.
  - Gunns Road will be extended, under the rail corridor, between Weston Road and Union Street at Turnberry Avenue.
- TTC buses will require space for five bus bays, including two that can accommodate 18 m articulated buses.
- TTC Route 512 St. Clair streetcar stops will be maintained in their current location.
- GO Rail Station Access Plan assumptions were as follows:

- The target modal split by 2031 is 56-58% walking; 20-22% local transit; 4-6% cycling; 20-22% pick-up/drop-off [5].

- CP corridor capacity and operating capabilities will be maintained to the extent possible.
- Station platforms and other features will be designed to accommodate freight dimensional clearances, to the extent possible.

2.3 Key Station Components

The following Project components comprise the IPD upon which this EPR Volume is based. Refinements to the design may be made prior to construction as previously noted. These project components are as described in the St. Clair West Station New Station Concept Summary Memorandum (Urban Strategies and WSP, 2017) and shown in the IPD provided in Appendix A.

2.3.1 Platforms

The station will feature two platforms: an island platform and a side platform on the western edge of the rail corridor. Both platforms extend from approximately Townsley Street to the northern edge of the adjacent vehicle storage lot.

2.3.2 Station Entrances

The main (southern) station access will be located just north of St. Clair Avenue West on both sides of the rail corridor. This entrance will feature a station building on the east side of the corridor, adjacent to a plaza fronting Union Street. This station building will be adjacent to a bus loop, para-transit lay-by, and covered and secure bicycle parking. A south tunnel will connect the east side of the rail corridor to the island platform and the side platform. The main station entrance will be the closest entrance for passengers transferring from the TTC 512 streetcar.

The secondary (northern) station access will be located just south of the Hydro corridor on both sides of the rail corridor. A pathway will connect Weston Road and the future Gunns Road extension to the side platform. A north tunnel will connect the east side of the rail corridor to the island platform and side platform in the vicinity of the bus loop.

2.3.3 Station Circulation

Staircases and elevators will provide access between station levels. Staircases will be covered or enclosed. Elevators will facilitate movement of wheelchairs, walkers, and other mobility devices between station levels.

Two tunnels (north and south) below the rail corridor and platforms will connect the station access points on the east side of the rail corridor with the vertical circulation to the platform level at the island platform and the west side platform. The tunnels will also facilitate neighborhood connectivity across the rail corridor for pedestrians and cyclists.

2.3.4 Bicycle Facilities

As outlined in the GO Rail Station Access Plan (Metrolinx, 2016), bicycle parking spaces will be provided, including secured spaces (within a limited-access room or structure) and covered spaces (protected from weather). Secured spaces will be located in the main station

[5] The PPUDO numbers from the GO Access Plan are unreasonably high given there will be no formal "PPUDO facilities. It is likely that there will be greater walking, transit and cycling access than originally forecast. Any PPUDO will be handled on street.

building. Opportunities will be explored to include additional bicycle parking facilities adjacent to the main and secondary station entrances.

2.3.5 *Landscaping and Streetscaping*

The main station access location is planned to include landscaping, tree planting and streetscaping amenities. A pedestrian and cyclist connection from St. Clair Avenue West to the main station access location is planned east of the rail corridor and may include stairs and an accessible ramp.

A pedestrian path is planned on the north side of St. Clair Avenue West; this is planned to link the intersection of St. Clair Avenue West and Weston Road to the west platform. This path may include stairs, an accessible ramp, and urban design treatments that enhance street presence.

A pathway west of the corridor will link the intersection of Gunns Road and Weston Road to the side platform. This path will include an accessible ramp and feature urban design treatments such as: lighting, landscaping, wayfinding, and architectural features. Specific landscaping and streetscaping features will be confirmed during detailed design.

2.3.6 *Transit Access*

The design of the station will connect to the TTC 512 St. Clair streetcar, and TTC Bus Routes 41, 89, 168 and 127. The TTC intends to terminate two bus routes at this station, with an additional two routes passing through the station. It is estimated that 50 buses per hour may stop at the station during weekday peak periods. Access from stops serving the 512 St. Clair streetcar to the main entrance will be provided via the pathway and existing sidewalks along St. Clair Avenue West.

A new U-shaped one-way street connecting to Union Street will provide a bus transfer area that is planned to include five bus bays, at least two of which will accommodate 18 m articulated buses. The bus bays and bus loop will allow buses to stop or turn around if required. In addition to the bus bays, this street will also allow for a curbside marked para-transit facility. The street design, alignment and width will protect for future development by others on the site.

The pathway from the planned Gunns Road extension is anticipated to provide a connection to potential future bus stops on Weston Road.

2.3.7 *Active Transportation Access*

Pedestrian access to the main station entrance will be provided via new planned sidewalks on Townsley Street and the Davenport Road extension, or via St. Clair Avenue West. Pedestrians accessing the station from the northeast will use the existing street network to reach the secondary access point.

Pedestrians will access the station from the west via pathways connecting to either end of the side platform. The north pathway will provide access to both Weston Road and the future Gunns Road extension. The south pathway will provide access to the intersection of St. Clair Avenue West and Weston Road. A pedestrian pathway is planned along the east side of the rail corridor, linking the main and secondary station entrances and passing by the bus bays.

There are currently limited cycling lanes and trails in the area, with no direct cycling connections to the site. A planned extension of Davenport Road to Union will include cycling lanes.

2.3.8 Vehicular Access

The primary point for vehicles to access the station will be from Union Street (east of the rail corridor). Neither a designated PPUDO nor vehicular parking will be provided.

2.3.9 Accessible Loading and Unloading

A para-transit lay-by is planned along the new U-shaped one-way street connecting to Union Street. This lay-by will be prominently marked through signage and pavement treatment.

2.3.10 Retaining Wall and Noise Wall

An existing retaining wall dividing the CP freight tracks from the GO/UP Express tracks will be reconstructed and relocated to the east to accommodate the station.

An existing noise wall along the west side of the rail corridor will be relocated further west to accommodate the side platform.

2.3.11 St. Clair Bridge

The St. Clair Avenue West Subway is anticipated to be directly impacted by the Project. Specifically, alterations to the subway are anticipated to be required to accommodate platforms and other station infrastructure. In addition, widening and lengthening of the St. Clair Bridge are required to accommodate CP track realignment and St. Clair Avenue West road widening associated with the TMP, respectively. Timing and sequencing of the bridge, track and station construction is being coordinated.

2.3.12 Emergency and Service Vehicle Corridor Access

Corridor access for emergency and service vehicles will be provided in coordination with current and planned street and block patterns. The existing entrance to the rail corridor, south of St. Clair Avenue West, will be maintained.

2.3.13 Property Acquisition

Property is anticipated to be required to facilitate Project construction and operation. Refinement of property requirements including laydown and staging areas will occur through detailed design.

The acquisition of non-Metrolinx owned property is required to implement the Project, as defined in the IPD (see Appendix A). Property requirements are anticipated to comprise of the following:

- Full property takings - none.
- Partial property takings:
  - Private - 1.44 ha.
- Temporary full property takings - none.
- Temporary partial property takings:
  - Private - 0.80 ha.

- Public - 0.80 ha.

- Other real estate considerations:
  - Private - 1.07 ha.

Other real estate considerations are anticipated to include lands for bike trails, station adjacent infrastructure, and other City initiatives.

2.3.14 *Utilities*

The owners of utility infrastructure located in the study area have been identified based on information extracted from record drawings and are presented in Table 2-1.

Table 2-1: Utilities within the Study Area

Utility Type	Utility Owners
Power, Cables, Conduits and Lighting	• Toronto Hydro • Hydro One
Gas and Oil	• Enbridge Gas Distribution
Communications	• Bell Canada • Rogers Cable Communications • Group Telecom
Railway	• CN signals
Municipal	• City of Toronto - Water, Sanitary, Stormsewer and wastewater

2.3.15 *Electrification*

Electrification is planned for this section of the Kitchener rail corridor by 2025, consistent with the GO Rail Network Electrification TPAP (Metrolinx, 2017). Electrification at the Project is anticipated to broadly consist of a 25 kV system delivering power to electric trains using an Overhead Contact System (OCS). The OCS is an aerial supply system that delivers traction power from Traction Power Substations (TPSS) to the electric trains via contact wires and associated supports and structures, including poles and other overhead line hardware and fittings. TPSSs are traction power facilities that transform the utility supply voltage for distribution to the electric trains via the OCS (Metrolinx, 2017).

2.3.16 *Construction*

A description of anticipated construction activities is provided in Table 2-2. These typical activities serve as the basis for the assessment of construction-related potential environmental effects. These activities may be expanded, further refined, or found to be unnecessary as the Project progresses through detailed design and construction.

Table 2-2: Anticipated Construction Activities

Activity	Description	Associated Equipment
Site Preparation	• Mobilization of equipment and temporary facilities to the site. • Clearing and grubbing of vegetation. • Erection of temporary and permanent fences. • Installation of environmental management features (e.g., erosion and sediment controls).	• Site compaction equipment and grading equipment. • Vegetation removal equipment. • Excavation equipment. • Haulage/dump trucks.
Site Servicing	• Relocation and/or extension of services and utilities on the site; which may include both underground and aerial services and utilities (e.g., sewers, water, electrical, communications, gas). This may also involve installation of utilities within the site.	• Excavation equipment including backhoe, dump trucks, spoil removal equipment, jackhammers.
Excavation and Grading	• Excavation and grading activities may involve earth-moving activities and stockpiling, as applicable. Excavated material will be accommodated on-site on the degree practicable, however, where necessary, surplus material will be disposed of off-site. • Any off-site disposal shall be done in compliance with applicable law, including as it relates to contaminated material that may be encountered. • Any groundwater encountered will be managed and disposed of in accordance with applicable law.	• Site compaction equipment and general grading equipment, dump trucks, soil removal equipment. • Groundwater pumping equipment. • Excavation equipment including backhoe, dump trucks, soil removal equipment, jack hammers.
Construction of Buildings and Structures	• All buildings and structures will be constructed using standard civil construction techniques.	• Foundation placement equipment • Augured piles, or rammed aggregate piers. • Drill rigs. • Mobile cranes and hoists. • Concrete trucks, pumps and vibrators.
Construction of Ancillary Facilities	• Ancillary facilities may include electrical transformer/supply equipment, parking areas, exterior yard facilities including lighting, electrification enabling facilities.	• Flatbed trucks, cranes, concrete trucks. • Backhoe, pavement excavation equipment. • Mobile cranes and hoists. • Concrete trucks, pumps and vibrators.
Installation of Trackwork	• Assembly of track, ties and fastenings near the station.	• Thermal welding. • Tie placement (cranes, lifting equipment). • Ballast placement equipment. • Concrete pouring equipment.
Temporary Track Diversion	• Grading. • Temporary drainage.	• Site compaction equipment and general grading equipment, dump

Activity	Description	Associated Equipment
	• Relocation/Installation of tracks. • Temporary relocation of signals, if any. • Clear delineation and protection between active rail service and construction work zones.	trucks, spoil removal equipment. • Thermal welding equipment. • Tie placement (cranes, lifting equipment). • Ballast placement equipment. • Temporary concrete barriers.
Temporary Road Closure	• All road closures will follow standard traffic control management guidelines.	• Temporary traffic control devices such as signs, signals, barriers, traffic barrels.
Management of Stormwater	• All precipitation falling within the site will be managed as stormwater within a designed system of collection, conveyance, retention and discharge features. The system will be designed and operated in compliance with applicable standards and regulatory requirements. Surface flows within the site will be managed within the site to ensure discharge to off-site receivers (i.e., municipal storm sewers) is appropriate in terms of water quantity and quality.	• Site compaction equipment and general grading equipment. • Groundwater pumping equipment.

2.4 Operations

A description of anticipated operation activities is provided in Table 2-3. These activities represent those with the potential for operations-based environmental effects and serve as the basis for assessment of potential environmental effects. These activities may be expanded, further refined, or found to be unnecessary as the Project progresses through detailed design and during operation.

Table 2-3: Anticipated Operation Activities

Activity	Description
General Operations	• New SmartTrack service on the Kitchener rail corridor with access provided at the Project. • TTC streetcar service with access to the Project from St. Clair Avenue West. • TTC bus service with access provided to the Project from Gunns Road, Turnberry Avenue and Union Street. • Para-transit vehicles accessing the Project via the access roads from Weston Road and Old Weston Rodd via Gunns Road, Union St. and Turnberry Ave. • Pedestrian and cyclist movements to/from the Project and surrounding areas at both platform levels and from the St Clair Avenue West.

3. Existing Conditions

This section of the EPR Volume documents existing environmental conditions within each of the discipline-specific study areas (refer to Table 1-1). The purpose of characterizing existing environmental conditions is to establish baseline conditions against which potential effects are assessed, as detailed in Section 4.

Further details on existing environmental conditions within each of the discipline-specific study areas and the methodologies used to obtain this information are provided in Appendices B through I of this Volume.

3.1 Natural Environment

This section provides an overview of existing natural environment conditions within the natural environment study area. Further details are provided in Appendix B of this Volume.

3.1.1 Methodology

The study area for the Natural Environment Report extends 120 m from the Project footprint.

Available background information was collected and reviewed from several sources, including but not limited to Fisheries and Oceans Canada (DFO), the Ministry of Natural Resources and Forestry (MNRF), the City of Toronto and the Toronto and Region Conservation Authority (TRCA).

Aquatic investigations examined Lavender Creek, which crosses the northern portion of the study area above and below ground (the watercourse is piped in a portion of the study area). Information collected focused on describing general habitat and documenting habitat features. Fish habitat information was collected where feasible.

Vegetation communities were mapped and classified using the Ecological Land Classification (ELC) for Southern Ontario system (Lee, et al., 1998) with 2008 and 2013 catalogue code updates (Lee, 2008 and 2013).

A vascular plant species list was completed for the study area.

Prior to site investigations, a desktop screening was completed to identify potential Species at Risk (SAR) habitat and other potential wildlife habitat associated with approximated vegetation communities and watercourses. During the site investigations, all direct wildlife observations and wildlife signs (including browse, tracks/trails, animal scat, bird nesting activity, tree cavities, burrows, excavated holes and vocalizations) were recorded. Incidental wildlife species observations were noted.

Significant Wildlife Habitat (SWH) was evaluated based on site-specific attributes within the study area compared to the Significant Wildlife Habitat Ecoregion Criteria Schedules for Ecoregion 7E (MNRF, January 2015).

A SAR Screening Table was developed to indicate the potential of a given SAR to occur based on habitat and known species distribution and the corresponding potential and severity of effects to the species associated with the proposed works.

3.1.2 Description of Existing Conditions

3.1.2.1 Aquatic Environment

Lavender Creek is a tributary to Black Creek in the Lower Humber River Watershed. It enters the north-east end of the study area and flows north to south (TRCA, 2008). The section of Lavender Creek in the study area is entombed for approximately 500 m; it enters a pipe and flows beneath the railway tracks and Weston Road, exiting the pipe approximately 100 m west of Weston Road.

The confluence of Lavender Creek and Black Creek occurs approximately 1.3 kilometres (km) to the west of the study area. Lavender Creek ultimately flows into the Humber River and Lake Ontario. Black Creek is an approximately 20 km long watercourse that forms a 68 square kilometers (km^2) subwatershed, one of the Humber River's smallest catchments. (TRCA, 2008). Black Creek is characterized by degraded function and warm water habitats as result of anthropogenic changes and no significant groundwater inputs (TRCA, 2008).

Recent activities within Lavender Creek at the upstream end of the study area to temporarily stabilize and protect an exposed Enbridge gas pipeline are currently under discussion between TRCA, the City of Toronto and Enbridge (TRCA, 2015). A permanent solution has yet to be determined. The outcome of these proposed works may affect the proposed works for this Project. Further consultation between these parties should be completed during the next phases of the Project.

There are no wetlands in the study area.

3.1.2.2 Terrestrial Environment

The study area represents a mosaic of urban land uses. Areas adjacent to the rail corridor consist of residential, commercial, and industrial infrastructure.

A total of 49 vascular plant taxa were observed within the study area and identified to species level. Of these, 16 (33%) were native and 33 (67%) were non-native.

No provincially, or federally rare species were observed. This includes species designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), species designated by Committee on the Status of Species at Risk in Ontario (COSSARO), species listed on the ESA or SARA, as well as S1 to S3 (critically imperiled, imperiled, or vulnerable) ranked species. All the native species were ranked as S5 (common and widespread within the province) or S4 (apparently secure - uncommon but not rare) except for one ranked as SU (unrankable due to a lack of or conflicting information).

Two species observed are listed as locally/regionally rare by TRCA (2003)[6] and in the City of Toronto (Varga, et al., 2000)[7] as shown in Table 3-1.

Table 3-1: Locally and Regionally Significant Plant Species

Common Name	Accepted Name	TRCA Rank	City of Toronto Rank
Virginia Mountain-mint	*Pycnanthemum virginianum*	L3	R1
Black-eyed-Susan	*Rudbeckia hirta*	L4	No Associated Rank

None of the flora SAR or Species of Conservation Concern (SCC) identified through background sources were observed within the study area during field studies.

Three vegetation communities were identified in the study area, as described below. All vegetation communities encountered during field investigations are common in Ontario and reflect the legacy of human disturbance within the study area.

1. Deciduous Forest (FOD): This unit is located to the far northern portion of the study area. Due to limited access to the ROW, species within the canopy, sub-canopy, understorey, and ground layer could not be identified.

2. Mineral Cultural Woodland (CUW1): This unit is located along the western edge of the Project footprint as a rough triangular patch of mid-aged woodland. The sparse canopy and understory layer contained abundant Manitoba maple (*Acer negundo*). Other tree species include white mulberry (*Morus alba*). The ground cover is dominated by non-native grasses, namely smooth brome (*Bromus inermis*) and creeping bentgrass (*Agrostis stolonifera*). This vegetation unit has been affected by anthropogenic disturbances as represented by the presence of invasive species.

3. Mineral Cultural Meadow (CUM1): This unit is located at the southern end of the Project footprint and contains an abundance of chicory (*Cichorium intybus)*, Canada thistle (*Cirsium arvense*), viper's-bugloss (*Echium vulgare*), virginia creeper (*Parthenocissus quinquefolia),* and crown vetch (*Securigera varia).*

[6] Codes are defined as follows:
L3: Of concern regionally; generally secure in natural matrix; able to withstand minor disturbance.
L4: Of concern in urban matrix; generally secure in rural matrix; able to withstand some disturbance.

[7] Codes are defined as follows:
U: Uncommon native species.
R: Rare native species.
#: The number of known occurrences.
+ or I: Introduced species.
X+: Introduced in municipality.

3.1.2.3 *Wildlife and Wildlife Habitat*

Urban/suburban-tolerant wildlife species were recorded during the site investigations.

No observations or signs of any mammal species were recorded in the study area during the site investigations; however, the general area likely supports a range of mammals often found in urban environments, including: Raccoon (*Procyon lotor*), Grey Squirrel (*Sciurus carolinensis*), Striped Skunk (*Mephitis mephitis*), and a number of small mammals that often go undetected (e.g., shrews, voles, mice) (Dobbyn, 1994).

Five bird species were recorded during the site investigations: Rock Pigeon (*Columbo liva*), Golden-crowned Kinglet (*Regulus satrapa*), Turkey Vulture (*Cathartes aura*), House Sparrow (*Passer domesticus*) and European Starling (*Sturnus vulgaris*). The birds observed are expected for the site conditions and are common and widespread throughout southern Ontario (Cadman, Sutherland, Beck, Lepage, & Couturier (eds), 2007).

No avian nests were observed during the site investigations, though suitable nesting habitat is present in the study area. Formal nest or bird surveys were not completed during the site visit due to access limitations.

No herpetofauna were observed during the site investigations. There is very little natural habitat in the study area; however, there could potentially be foraging habitat for the following amphibian and reptile species found in similar urban habitats: American Toad (*Anaxyrus americanus*), Dekay's Brownsnake (*Storeria d. dekayi*), and Eastern Gartersnake (*Thamnophis s. sirtalis*) (Ontario Nature, 2017). No specialized habitat features (e.g., amphibian breeding habitat, reptile overwintering habitat) were observed or are likely to occur in the study area.

3.1.2.4 *Significant Wildlife Habitat*

Field investigations for wildlife habitat did not identify any candidate SWH according to the SWH Technical Guide and Ecoregion 7E Criteria Schedule (MNRF, 2015).

Through correspondence with the MNRF, records of confirmed SWH were not identified within the study area.

3.1.2.5 *Species at Risk or Species of Conservation Concern*

A total of 21 SAR was identified within the general vicinity of the Project through the background research and Agency consultation, of which 10 were determined to have no potential to occur in the study area, seven have minimal potential to occur, and 4 have moderate potential to occur. Only SAR identified to have a moderate or high potential to occur or those confirmed present within the study area are shown in Table 3-2 and discussed further.

Table 3-2: Species at Risk

Common Name	Accepted Name	S-rank[1]	ESA Status[2]	SARA Status[3]
Barn Swallow	*Hirundo rustica*	S4B	Threatened	Threatened
Chimney Swift	*Chaetura pelagica*	S4B, S4N	Threatened	Threatened
Common Nighthawk	*Chordeiles minor*	S4B	Special Concern	Threatened
Peregrine Falcon	*Falco peregrinus anatum*	S3B	Special Concern	Special Concern

Status Sources:
[1]**S-Rank** (MNRF, 2017)
S1: Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2: Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3: Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4: Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5: Secure - Common, widespread, and abundant in the nation or state/province.
S#S#: Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
SR or ? - Recorded within a nation or subnation, but local status not available or not yet determined. When combined with a global rank of G1 to G3, local status is 'Indeterminate,' but the entity is nevertheless presumed vulnerable, if still extant.
N - rank for non-breeding populations in the province.
B - rank for breeding populations in the province.
[2]**ESA** (Endangered Species Act) Status (MNRF, 2018)
[3]**SARA** (Species at Risk Act) Status (federal status - listed) (Government of Canada, 2018)
Extinct - A species that no longer exists anywhere.
Extirpated (EXT) - Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.
Endangered (END) - Lives in the wild in Ontario but is facing imminent extinction or extirpation.
Threatened (THR) - Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.
Special concern (SC) - Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.
Not at Risk (NAR) - A species that has been evaluated and found to be not at risk.
Data Deficient (DD) - A species for which there is insufficient information for a provincial status recommendation.

A review of the MNRF NHIC database did not identify any aquatic SAR species records within 1 km of the study area. Additionally, the MNRF has no known records of aquatic SAR and DFO SAR Mapping did not show any aquatic SAR or critical habitat within the study area and/or in the general vicinity (DFO, 2017). No fish community sampling was undertaken.

There is moderate potential for Barn Swallow to be nesting beneath bridges in the study area or in open structures. Barn Swallows were not observed during 4T's field investigations. Field investigations for Barn Swallow nests on the rail bridge were conducted to support the St. Clair Transportation Master Plan, no Barn Swallow nests were observed (LGL Limited, 2015). Nesting habitat for Barn Swallow is protected under the ESA.

There is moderate potential for Common Nighthawk and Chimney Swift to nest in the study area. Common Nighthawk could potentially nest on rooftops and Chimney Swift could nest in open chimneys or other suitable structures. Both species could also occur as foraging visitants throughout the study area. Neither was observed during field investigations.

There is moderate potential for Peregrine Falcon to occur as a foraging visitant throughout the study area. There is potentially suitable nesting habitat on taller buildings in the vicinity of the study area. While appropriate foraging habitat exists in the study area for this species, its habitat is not protected by the ESA. Peregrine Falcon is protected under the *Fish and Wildlife Conservation Act, 1997*.

The study area was re-visited to confirm presence/absence of Barn Swallow, Common Nighthawk, Chimney Swift and Peregrine Falcon on June 19, 2018; no individuals or their nests were identified.

3.1.2.6 Significant Natural Heritage Features

Significant Natural Heritage Features include any features designated by the MNRF, Conservation Authority or municipality governing the area in which the project is based.

A small portion of the study area is within the Ravine and Natural Feature Protection By-law limits.

A small portion of the study area is within the City of Toronto natural heritage system adjacent to Weston Road (City of Toronto, 2017a)

The TRCA Regulated Area occurs outside of the study area (City of Toronto, 2017a).

No mapped Provincially Significant Wetlands (PSWs), Non-Provincially Significant or Unevaluated Wetlands, Significant Woodlands, Significant Valleylands, Provincial or Candidate Areas of Natural and Scientific Interest (ANSIs) occur within the study area.

Figure 3-1 shows natural heritage features within the study area.

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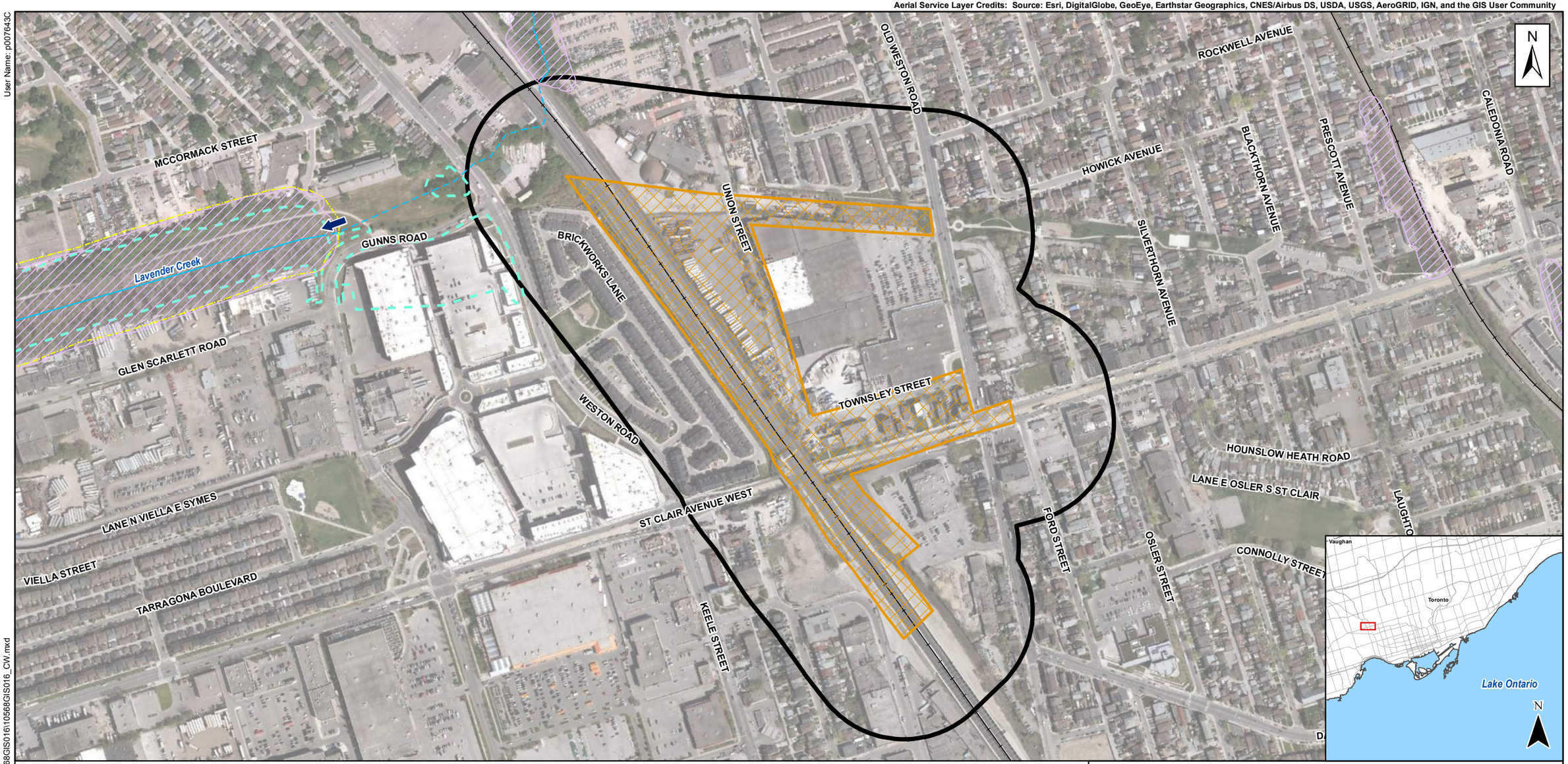

Legend

- Study Area - 120 metres
- Project Footprint (approximate)
- Permanent Watercourses - above ground
- Permanent Watercourses - below ground
- Railway
- Flow Direction
- TRCA Regulation Limit
- Natural Heritage System
- Ravine and Natural Feature Protection Bylaw

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs
Ravine and Natural Features - City of Toronto
Regulation Limit - Toronto Region Conservation Authority

0 50 100 200 300 Metres

Project:	**New SmartTrack Stations**		
Figure Title:	**St.Clair-Old Weston SmartTrack Station - Designated Natural Heritage Features**		
Prepared By:	4TRANSIT PARSONS HATCH WSP	**Date:**	**May 11 2018**
Version: CW.EPR.100-1	**Review:**	**Figure:** 3-1	

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3.2 Geology and Groundwater

This section provides an overview of existing geology and groundwater conditions within the study area.

Refer to Section 4.3 for geology and groundwater effects assessment, mitigation and monitoring.

3.2.1 Methodology

Topographic, surficial geology and bedrock geology mapping available through Natural Resources Canada and the Ontario Geological Survey, as well as other relevant background documentation was reviewed. Water well records were obtained from the Ministry of the Environment and Climate Change (MOECC).

3.2.2 Description of Existing Conditions

3.2.2.1 Landforms and Physiography

The study area is situated on the South Slope Physiographic Region (Chapman & Putnam, 1984). This region lies between the lower elevation Iroquois Lake Plain physiographic region along Lake Ontario and the higher elevation Oak Ridges Moraine physiographic region. The study area is also located south of the Peel Plain physiographic region. The South Slope rises approximately 100 - 120 m in an average of 10 km (Chapman & Putnam, 1984).

3.2.2.2 Soils and Bedrock Geology

The site exists in a drumlinized till plains physiographic landform. In the vicinity of the study area the slope is composed largely of bevelled till, with faint drumlins (Chapman & Putnam, 1984). Soils in the vicinity are mostly formed from glacial ice deposits and consist of young tills, generally clayey silt tills and sandy silt till (Sharpe, 1980).

3.2.2.3 Groundwater Resources

The approved Source Protection mapping was reviewed for the Credit Valley, Toronto and Region and Central Lake Ontario (CTC) Source Protection Region (2015). The study area is located within the Highly Vulnerable Aquifer (HVA) but outside (greater than 20 km) all wellhead protection areas identified in the Plan.

Hydrogeological and geo-environmental studies will be completed in support of detailed design to further characterize existing conditions.

No evidence of groundwater seepage was observed within the study area during site investigations.

3.3 Tree Inventory

This section provides an overview of existing trees within the study area. Further details are provided in Appendix C of this Volume.

Refer to Section 4.4 for effects assessment, mitigation and monitoring with respect to trees.

3.3.1 Methodology

The study area for the Tree Inventory Plan (TIP) extends 6 m beyond the Project footprint (as required by City of Toronto's Private Tree By-law and Parks By-law).

A desktop review was undertaken using online mapping, including the City of Toronto's interactive mapping tool. Relevant guidelines and documents were also reviewed and followed to guide fieldwork and inform the assessment, including relevant City of Toronto By-laws, the ESA and Canadian Food Inspection Agency (CFIA) directive (D-03-08) (Canada Food and Inspection Agency, 2014).

Trees were identified based on categories as follows:

1. Trees with diameters of 30 cm or more situated on private property within the Project footprint.
2. Trees with diameters of 30 cm or more situated on private property, within 6 m of the Project footprint.
3. Trees of all diameters situated on City owned parkland within 6 m of the Project footprint.
4. Trees of all diameters situated within lands designated under City of Toronto Municipal Code, Chapter 658, Ravine Protection.
5. Trees of all diameters situated within the City road allowance adjacent to the Project footprint.

Categories 1 and 2 relate to the City of Toronto Private Tree By-law (City of Toronto, 2015b), Category 3 relates to the City of Toronto Parks By-law (City of Toronto, 2017b), Category 4 relates to the City of Toronto Ravine and Natural Feature Protection By-law (City of Toronto, 2016) and Category 5 relates to the City of Toronto Trees on City Streets By-law (City of Toronto, 2015b).

Site visits were undertaken within the study area limits. Individual trees greater than 10 cm Diameter and Breast Height (DBH) within the Kitchener rail corridor were identified and tagged. Trees on private property where no Permission to Enter (PTE) had been obtained were identified from the rail corridor or public property, where possible. Trees and shrubs less than 10 cm DBH were identified but not tagged in the field. Where the canopy of trees overlapped, trees were assessed as a grouping and labelled accordingly.

Parameters were derived from International Society of Arboriculture (ISA) Best Management Practices (International Society of Arboriculture, 2008). These criteria were applied during the fieldwork to provide a holistic assessment of trees within the study area.

A TIP was prepared identifying tree locations and identification numbers/letters within the study area (see Appendix C of this Volume).

3.3.2 Description of Existing Conditions

The site is characterized by urban and industrial land. The largest area of naturalized vegetation is a cultural woodland community at the north end of the study area to the west of the rail corridor and to the east of Weston Road. To the west of the rail corridor are mainly residential areas consisting of townhouses. To the east of the rail corridor is primarily industrial uses. The Kitchener rail corridor runs in a generally northwest-southeast direction. Lavender Creek crosses north of the study area where it is buried. The terrain is generally flat except for a berm separating the rail corridor from townhomes to the west.

Trees and shrubs observed throughout the study area consist of a high percentage of non-native species that have either been planted or occurred naturally that range in size from less than 10 cm to approximately 50 cm DBH.

A total of 23 trees with greater than (>) 10 cm DBH were assessed within the Kitchener rail corridor ROW and an additional 73 trees >10 cm DBH were assessed inside the study area. An additional 189 trees less than (<) 10 cm DBH were assessed within the rail corridor.

Most of the trees within the study area are located along the eastern edge of the corridor next to the Canadian Pacific (CP) rail line. Trees with greater than 10 cm DBH within the rail corridor consist of one Siberian Elm (*Ulmus pumila*) and two Manitoba Maples (*Acer negundo*). Trees less than 10 cm DBH within the corridor consist of (in order of abundance): Manitoba Maple, Siberian Elm, Choke Cherry (*Prunus virginiana*), Staghorn Sumac (*Rhus typhina*), and Eastern Cottonwood (*Populus deltoides*).

Trees greater than 10 cm DBH outside the rail corridor but within the study area are located mainly along city streets and behind townhomes to the west of the rail corridor. As some of these areas were assessed after sundown, identification to species was not possible. Trees consist of (in order of abundance): Maples (*Acer* spp.), Siberian Elm, Manitoba Maple, Little-leaf Linden (*Tilia cordata*), Honey-locust (*Gleditsia triacanthos*), White Spruce (*Picea glauca*), London Plane Tree (*Platanus x acerifolia*), Norway Maple (*Acer platanoides*), Silver Maple (*Acer saccharinum*), Austrian Pine (*Pinus nigra*), Red Maple (*Acer rubrum*), White Elm (*Ulmus americana*), White Mulberry (*Morus alba*), Cherry (*Prunus* sp.), Eastern Cottonwood and Fir (*Abies* sp.).

A majority of trees are in good condition. However, some trees show signs and symptoms of abiotic and biotic defects leading to decline.

Red Mulberry was not identified within the study area.

No woody vegetative SAR (e.g., Butternut) were observed within the study area.

Figure 3-2 to Figure 3-5 identify the locations of trees that are greater than 10 cm DBH within the study area. Trees less than 10 cm DBH were accounted for but not noted as tree groups.

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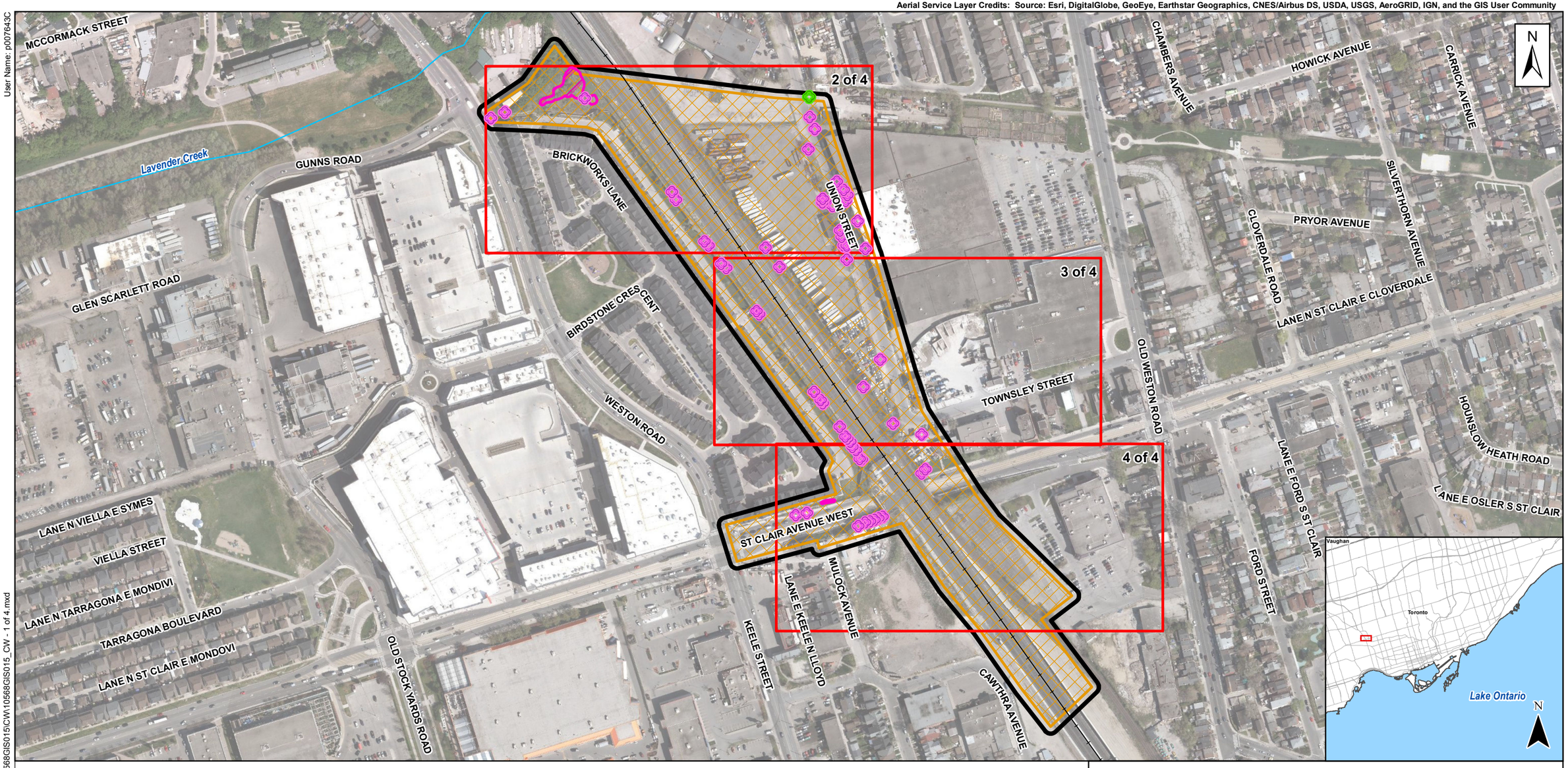

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Legend

- Study Area - 6 metres
- Project Footprint (approximate)
- Permanent Watercourse
- Railway

Existing Individual Tree (Not OLS Surveyed)

- To Be Preserved
- To Be Removed

Existing Tree Groupings (Not OLS Surveyed)

- To Be Removed

DATA SOURCES:

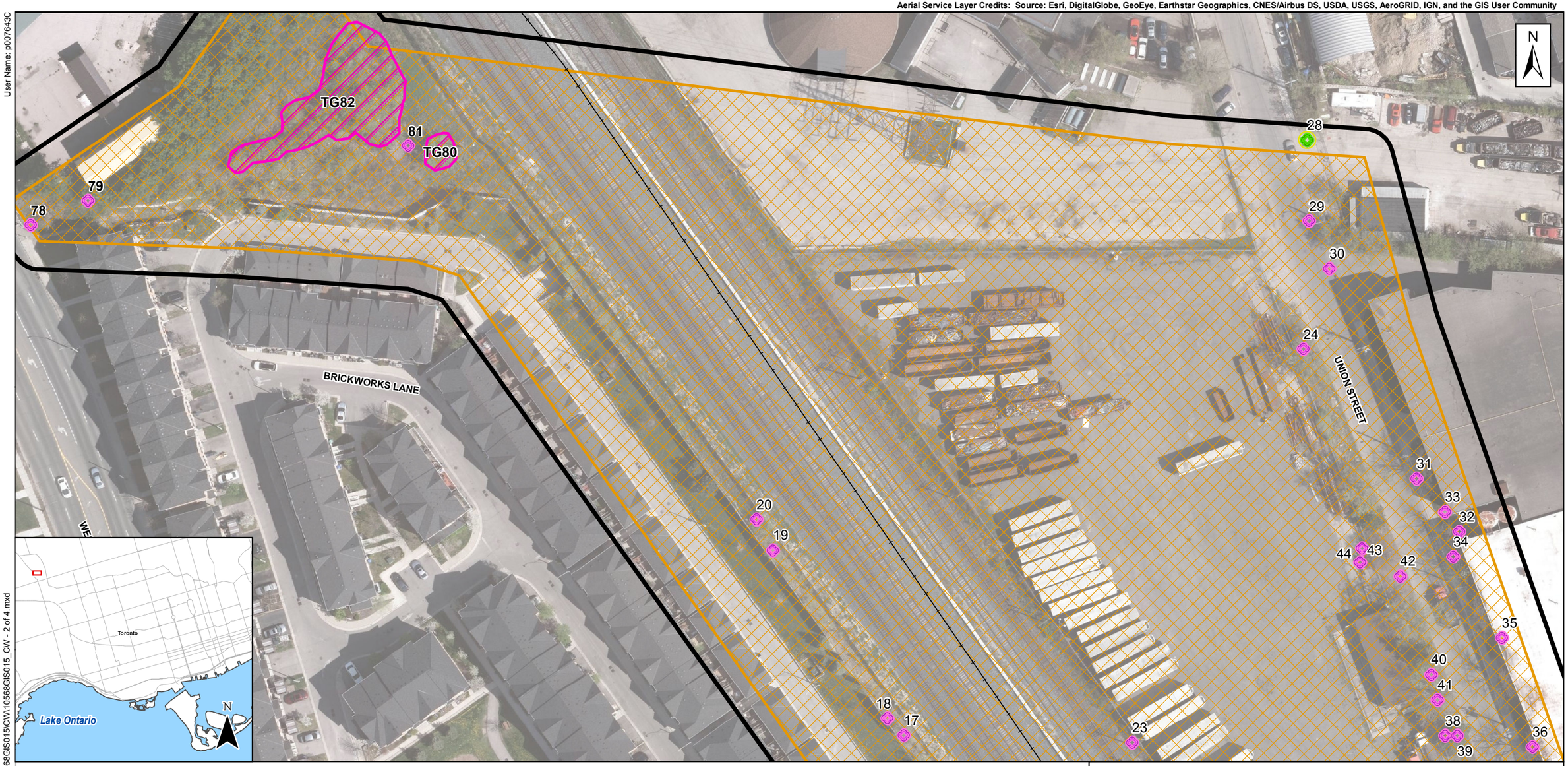
Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs

0 25 50 100 150 200 Metres

Project:	**New SmartTrack Station**		
Figure Title:	**St. Clair-Old Weston SmartTrack Station Tree Inventory - Overall**		
Prepared By:	4TRANSIT PARSONS HATCH WSP	**Date: July 04 2018**	
Version: CW.EPR.100-1	**Review:**	**Figure: 3-2**	

Aerial Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

User Name: p0076643C



Legend

- Study Area - 6 metres
- Project Footprint (approximate)
- Railway
- Tree Protection Zone (TPZ)

Existing Individual Tree (Not OLS Surveyed)

- To Be Preserved
- To Be Removed

Existing Tree Groupings (Not OLS Surveyed)

- To Be Removed

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs
Individual Trees - Parsons

0 5 10 20 30 40 50 Metres

Project:	**New SmartTrack Station**		
Figure Title:	**St. Clair-Old Weston SmartTrack Station Tree Inventory - North**		
Prepared By:	4TRANSIT PARSONS HATCH WSP	**Date: July 04 2018**	
Version: CW.EPR.100-1	**Review:**	**Figure: 3-3**	

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Legend

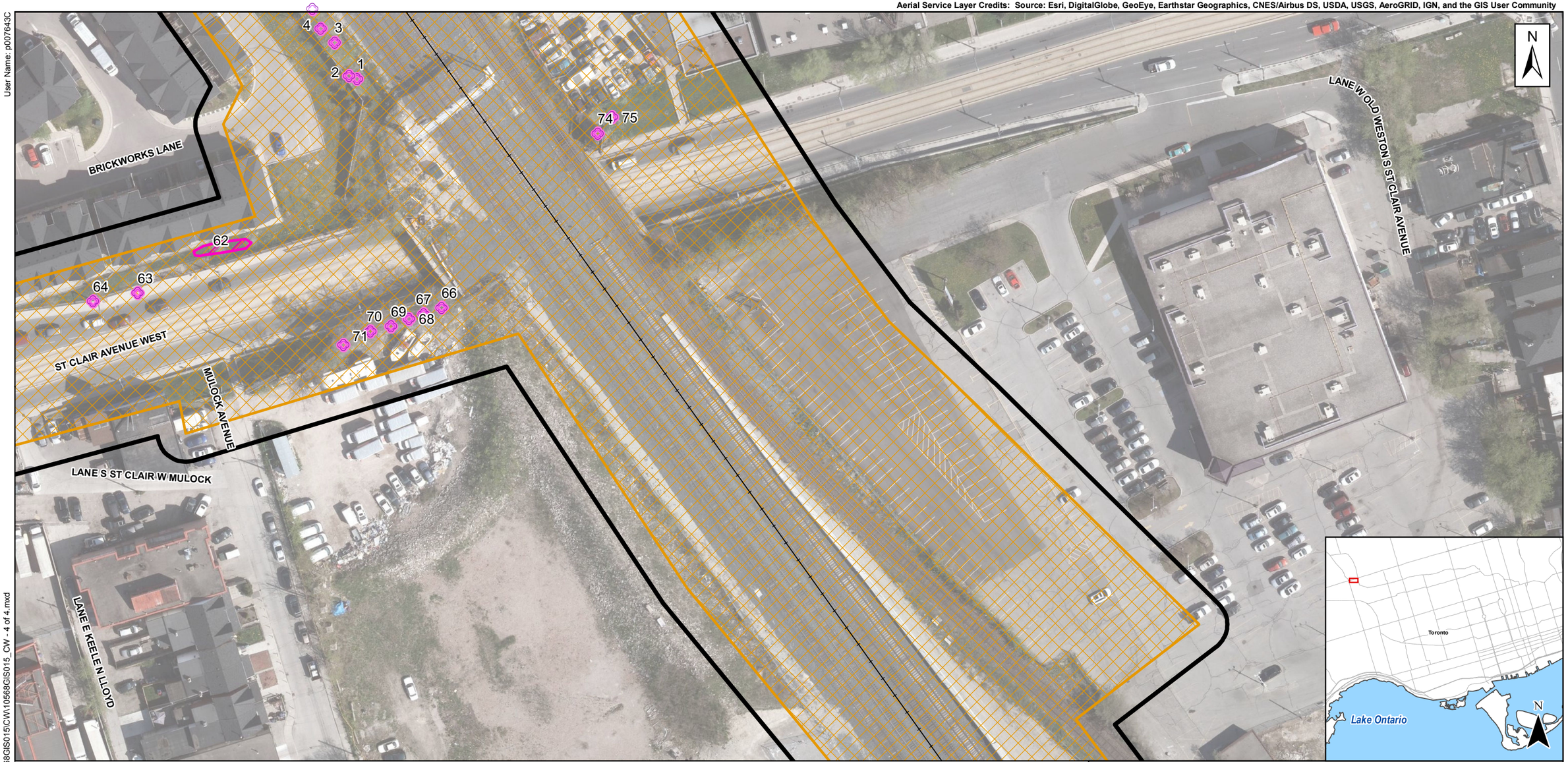
- Study Area - 6 metres
- Project Footprint (approximate)
- Railway
- Tree Protection Zone (TPZ)
- **Existing Individual Tree (Not OLS Surveyed)**
- To Be Removed

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs
Individual Trees - Parsons

0 5 10 20 30 40 50 Metres

Project:	**New SmartTrack Station**		
Figure Title:	**St. Clair-Old Weston SmartTrack Station Tree Inventory - Central**		
Prepared By:	4TRANSIT PARSONS HATCH WSP	**Date: February 13 2018**	
Version: CW.EPR.100-1	**Review:**	**Figure: 3-4**	



Legend

- Study Area - 6 Metres
- Proposed Project Footprint (approximate)
- Railway
- Tree Protection Zone (TPZ)

Existing Individual Tree (Not OLS Surveyed)

- To Be Removed

Existing Tree Groupings (Not OLS Surveyed)

- To Be Removed

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs
Individual Trees - Parsons

0 5 10 20 30 40 50 Metres

Project:	**New SmartTrack Station**		
Figure Title:	**St. Clair-Old Weston SmartTrack Station Tree Inventory - South**		
Prepared By:	4TRANSIT PARSONS HATCH	**Date: July 04 2018**	
Version: CW.EPR.100-1	**Review:**	**Figure:** 3-5	

3.4 Cultural Environment

This section provides an overview of existing cultural environment conditions within the study area, including Built Heritage Resources (BHRs) and Cultural Heritage Landscapes (CHLs), and archaeological resources. Further details are provided in Appendices D and D of this Volume of this EPR, respectively.

Refer to Section 4.5 for cultural environment effects assessment, mitigation and monitoring.

3.4.1 Built Heritage Resources and Cultural Heritage Resources

3.4.1.1 Methodology

The study area for the Cultural Heritage Screening Report (CHSR) is defined by the Project footprint and immediately adjacent lands, encompassing the broadest area in which cultural heritage resources might be affected.

The CHSR was conducted in accordance with the Metrolinx Interim Cultural Heritage Management Process (Metrolinx, 2013) and the Standards and Guidelines for the Conservation of Provincial Heritage Properties (MTCS, 2010) issued under the *Ontario Heritage Act* (OHA).

The following tasks were undertaken in the preparation of the CHSR:

- Reviewed primary and secondary (e.g., historical maps, images, aerial photographs, tax assessment rolls) source material to provide information about property history and current properties that have known or potential Cultural Heritage Value or Interest (CHVI);
- Conducted an overview of the historic background of the area to address the uses of the land and the development of the area;
- Conducted a property visit to confirm and identify properties with known or potential CHVI;
- Conducted a screening for previously identified Cultural Heritage Resources (CHRs) and potential CHRs;
- Conducted a review of previous CHSRs, Cultural Heritage Evaluation Reports (CHERs), Cultural Heritage Assessment Reports (CHARs) and Heritage Impact Assessments (HIAs) previously prepared by/for Metrolinx; and
- Provided recommendations for further evaluation of potential Provincial Heritage Properties (PHPs), conditional heritage properties or adjacent lands.

The municipal heritage inventory was reviewed to identify whether properties and structures have been previously identified and/or have been designated under the OHA. Consultation with the City of Toronto was conducted to confirm those properties that are listed on the City's Heritage Register or Designated under Parts IV or V of the OHA. The Ontario Heritage Trust (OHT) provided information for properties on the *OHA* register of municipally-designated properties and OHT easements. The Heritage Bridge List was provided by the Ministry of Transportation (MTO).

In July 2018 a CHAR was prepared to build on the findings of the CHSR and to identify potential adverse impacts to identified cultural heritage resources and to recommend mitigation measures to lessen or avoid any identified impacts. The results of this CHAR are included in this Volume of the EPR.

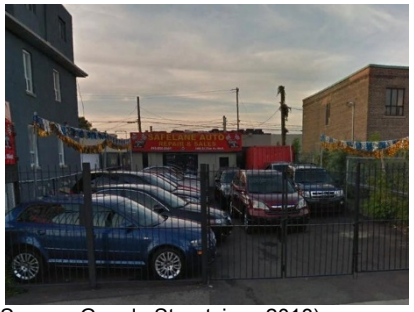
3.4.1.2 Description of Existing Conditions

One property in the study area was previously identified to have potential CHVI by the City of Toronto: the St. Clair Avenue West Subway. Through the screening process, additional properties in the study area have been identified as holding potential CHVI. Table 3-3 lists these properties, which are also shown on Figure 3-6.

Table 3-3: Properties with Potential or Identified Cultural Heritage Value or Interest

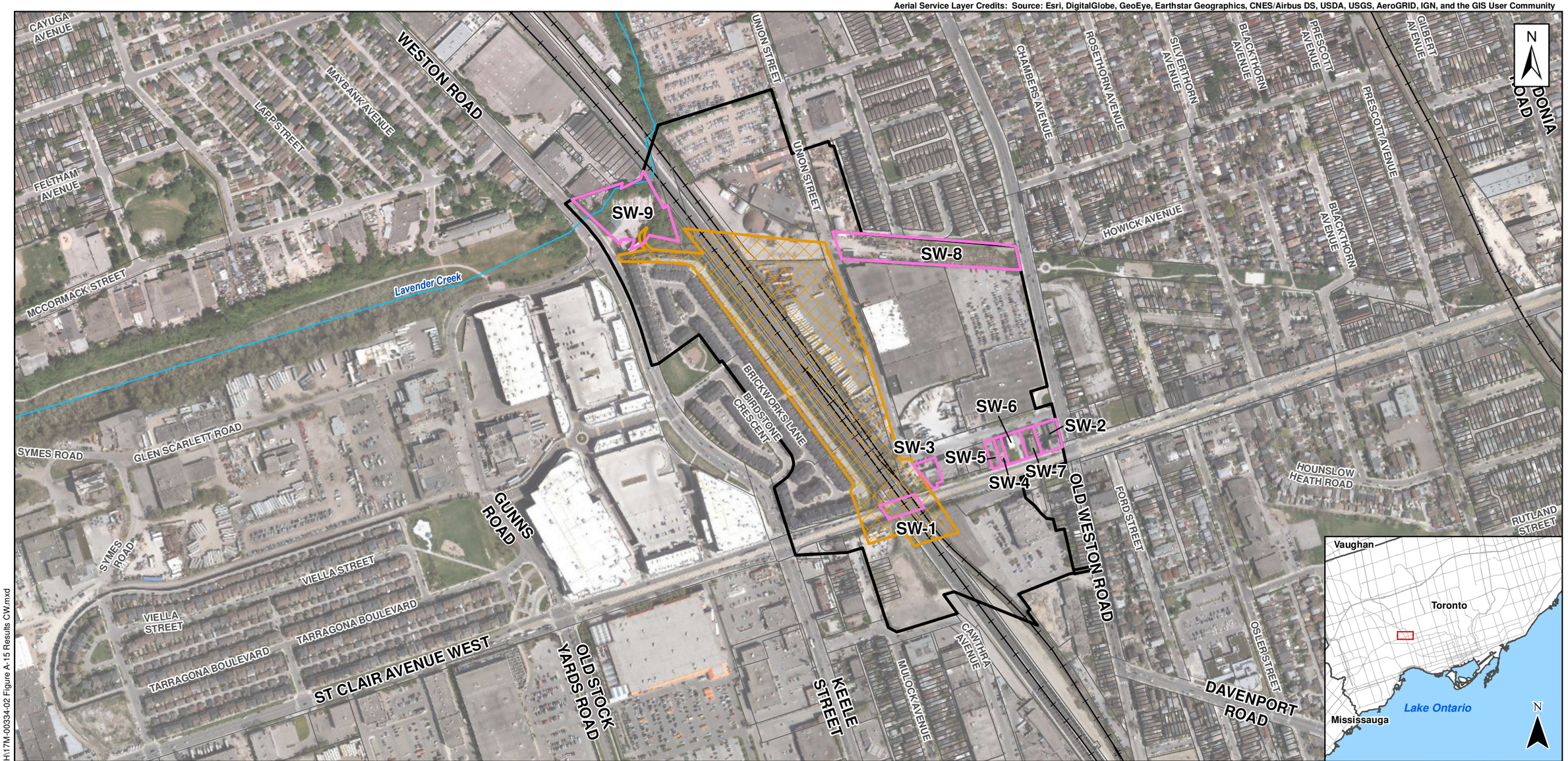
Cultural Heritage Resource #	Municipal Address	Previous Heritage Recognition	Description	Image
SW-1	St. Clair Avenue West Subway	Provincial Heritage Property	This property has been identified as a PHP for its physical, associative and contextual value. The physical features of the St. Clair Avenue West Subway which embody the cultural heritage value or interest are: • The excavated road allowance resulting in St. Clair Avenue passing below the rail corridor; • The two-span precast concrete deck slab structure; • The cast-in-place concrete abutments and open spandrel centre pier; • The '1931' date stamp; • The fabric of the structure, reinforced concrete; • The cast-in-place concrete retaining walls with panel detailing; • The original pipe handrails remaining on the top of the retaining walls; • Elevated sidewalks along both sides of St. Clair avenue West; and • The concrete stairways in the embankments from the retaining walls.	

Cultural Heritage Resource #	Municipal Address	Previous Heritage Recognition	Description	Image
SW-2	Heydon House (1834 St. Clair Avenue West)	Designated under Part IV of the OHA, By-law 599-83	This property is designated under Part IV of the OHA. The 'Reasons for the designation' as listed in Schedule B of By-law 599-83 are, as follows: "This building is designated on architectural grounds. Originally known as Heydon House, it was built in 1891 as an hotel by Alexander J. Heydon and it served as a residence for single men working on the railways and in factories nearby. The rounded corner bay window, brick arched windows, stone lintels and noteworthy three storey-high glazed entrance identify this brick building as an important landmark from an early period of local development." Although the By-law does not list the property's heritage, the potential heritage attributes are related to the structure and its physical elements.	
SW-3	1900 St. Clair Avenue West	None. Potential CHVI (identified during screening)	This property has no previous heritage designation or recognition. The potential CHVI and heritage attributes are limited to elements of the one-storey structure and its physical elements.	 (Source: Google Streetview, 2018)

Cultural Heritage Resource #	Municipal Address	Previous Heritage Recognition	Description	Image
SW-4	1866 St. Clair Avenue West	None. Potential CHVI (identified during screening)	This property has no previous heritage designation or recognition. The potential CHVI and heritage attributes are limited to elements of the two-and-a-half-storey structure and its physical elements.	 (Source: Google Streetview, 2018)
SW-5	1862 St. Clair Avenue West	None. Potential CHVI (identified during screening)	This property has no previous heritage designation or recognition. The potential CHVI and heritage attributes are limited to elements of the one-storey structure and its physical elements.	 (Source: Google Streetview, 2018)
SW-6	1860 St. Clair Avenue West	None. Potential CHVI (identified during screening)	This property has no previous heritage designation or recognition. The potential CHVI and heritage attributes are limited to elements of the two-storey brick structure and its physical elements.	 (Source: 4T, 2018)

Cultural Heritage Resource #	Municipal Address	Previous Heritage Recognition	Description	Image
SW-7	1850 St. Clair Avenue West	None. Potential CHVI (identified during screening)	This property has no previous heritage designation or recognition. The potential CHVI and heritage attributes are limited to elements of the one-storey structure and its physical elements.	 (Source: 4T, 2018)
SW-8	Hydro Corridor	None. Potential CHVI (identified during screening)	This property has no previous heritage designation or recognition. The potential CHVI and heritage attributes are limited to components within the corridor, east of Union Street.	 (Source: 4T, 2018)
SW-9	ABC Lumber (17T 623326.60 E, 4837043.19 N)	None. Potential CHVI (identified during screening)	This property has no previous heritage designation or recognition. The CHVI of the property lies in the c.1900 concrete block, front gable structure and its physical elements.	 (Source: Google Streetview, 208)

Aerial Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Document Path: T:\17M-00334-02\Arch\MXD\StClair\CH\17M-00334-02 Figure A-15 Results CW.mxd

Legend

- Study Area
- Proposed Project Footprint (approximate)
- Permanent Watercourse
- Railway
- Property Parcels
- Potential Cultural Heritage Resources

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs

0 50 100 200 300 Metres

Project:	**New SmartTrack Station**		
Figure Title:	**St Clair-Old Weston SmartTrack Station - Cutlural Heritage Screening Report Results**		
Prepared By:	4TRANSIT PARSONS HATCH WSP	**Date:**	**May 13 2018**
Version: CW.EPR.100-1	**Review:**	**Figure:** 3-6	

3.4.2 Archaeology

3.4.2.1 Methodology

The study area for the Stage 1 Archaeological Assessment (AA) extends approximately 50 m from the Project footprint as defined in the IPD (see Appendix A).

Archaeological activities were carried out in accordance with the Standards and Guidelines (S&G) for Consultant Archaeologists (MTCS, 2011).

The Stage 1 AA involved a review of documents including historic maps, aerial photographs and local histories. Property inspections of the rail corridor and property visible from the corridor were conducted.

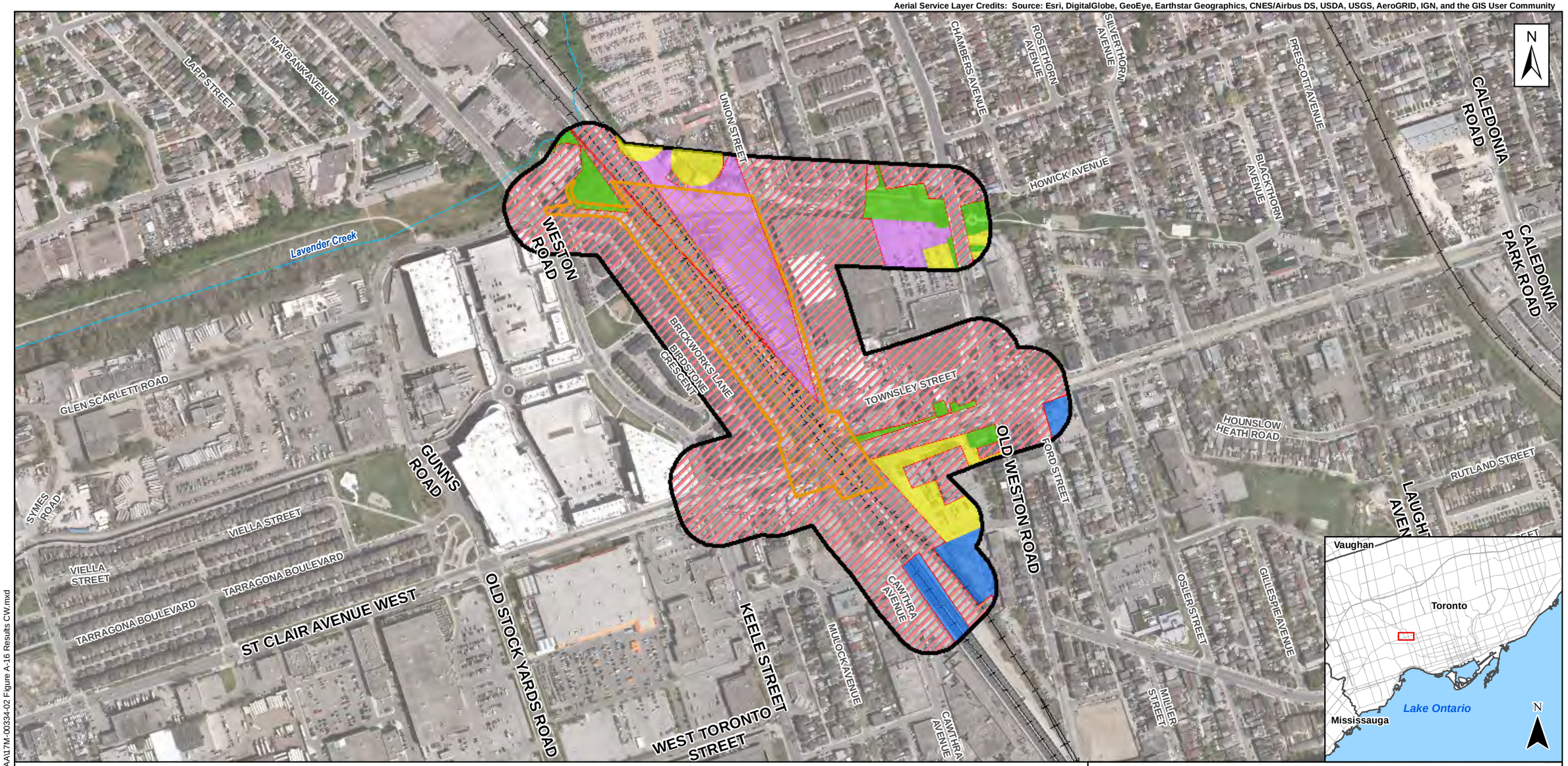
Archaeological recommendations were made based on background historical research, locations of known or registered archaeological sites, previous AAs, and indicators of archaeological potential as outlined in Section 1.3.1 of the 2011 S&G.

3.4.2.2 Description of Existing Conditions

The Stage 1 AA found that the location of the study area in close proximity to primary water sources (Lavender Creek is within the study area, and Black Creek is within 1 km) and historic transportation routes (St. Clair Avenue West, Weston Road, Old Weston Road and the rail corridor) indicates that the property holds potential for the recovery of both pre-contact and contact period archaeological resources.

Figure 3-7 presents the results of the Stage 1 AA showing archaeological potential requiring Stage 2 AA.

Aerial Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Study
- Proposed Project Footprint (approximate)
- Permanent Watercourse
- Railway
- Stage 2 Required: Test Pit Survey
- Stage 2 Required: Deeply Buried Potential
- Low Potential: Disturbed
- No Further Assessment Required
- Construction Monitoring

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs

0 50 100 200 300 Metres

Project:	**New SmartTrack Station**		
Figure Title:	**St. Clair-Old Weston SmartTrack Station Stage 1 Archaeological Assessment Results**		
Prepared By:	4TRANSIT PARSONS HATCH WSP	**Date:**	**July 10 2018**
Version: CW.EPR.100-1	**Review:**	**Figure:** 3-7	

Document Path: T:\17M-00334-02\Arch\MXD\StClairAA\17M-00334-02 Figure A-16 Results CW.mxd

3.5 Socio-Economic and Land Use

This section provides an overview of existing socio economic and land use conditions within the study area. Further details are provided in Appendix F of this Volume.

Refer to Section 1.1 for socio-economic and land use effects assessment, mitigation and monitoring.

3.5.1 Methodology

The study area for the Socio-economic and Land Use Study extends 500 m from the Project footprint.

A desktop review and site visit to determine existing conditions was undertaken for the study area. The desktop review included relevant policy and planning documents at the provincial and municipal levels, and data provided by the City of Toronto, Statistics Canada and TTC.

Photographs from the site visit are provided in Appendix F of this Volume.

3.5.2 Description of Existing Conditions

3.5.2.1 Planning Policy Context

The following provincial and municipal policies were considered in the context of project planning:

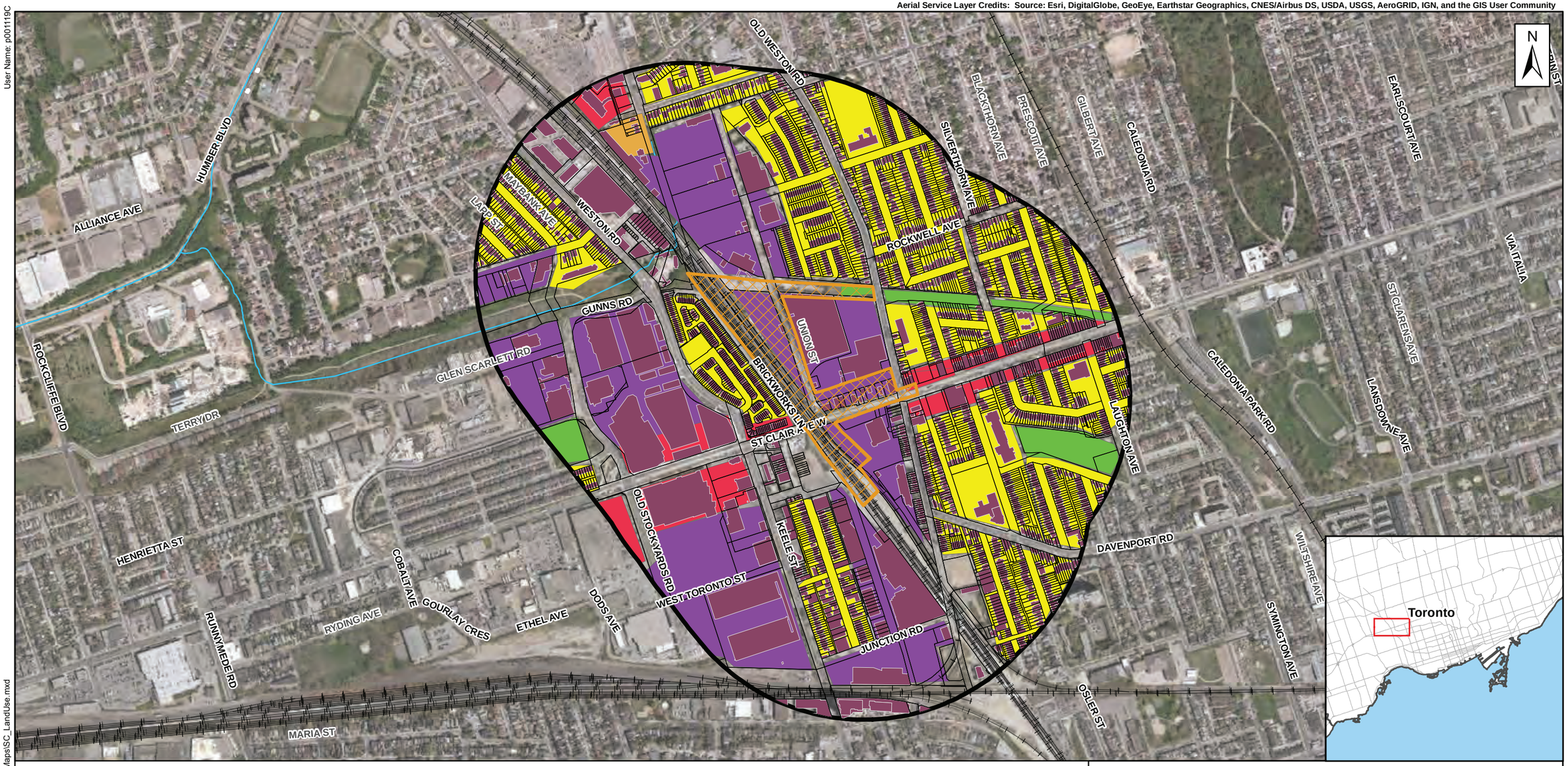
- Provincial Policy Statement (PPS) (Ministry of Municipal Affairs and Housing, 2014);
- Growth Plan for the Greater Golden Horseshoe (Ministry of Municipal Affairs, 2017);
- Metrolinx Regional Transportation Plan (Metrolinx, 2012);
- TRCA Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (O. Reg. 166/06) (Toronto and Region Conservation Authority, 1990);
- City of Toronto Official Plan;
- City of Toronto Secondary Plans and Precinct Plans; and
- The City of Toronto Zoning By-Law No. 438-86 and 569-2013.

Land use designations in the study area are shown on Figure 3-8. The City of Toronto Official Plan designates lands within the study area as Employment Areas, Neighbourhoods, Regeneration Areas, Mixed-Use Areas, and Parks. The Project footprint is primarily covered by the Utility Corridors designation, recognizing the presence of the existing Kitchener rail corridor.

Lands within the Project footprint are split zoned. The Project footprint is zoned in the City of Toronto Zoning By-law 569-2013 as: Employment Industrial - E; Residential - R; Commercial Residential - CR; and Utility Transportation - UT. These zones permit transportation uses under the condition that the transportation uses must comply with all requirements for a building on the subject lot.

User Name: p001119C

Aerial Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Study Area - 500 Metres
- Proposed Project Footprint (approximate)
- Permanent Watercourse
- Railway

Land Use Designations

- Neighbourhoods
- Mixed Use Areas
- Parks
- Employment Areas
- Apartment Neighbourhoods

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs
Land Use Designations - Toronto Official Plan 2015
Parcel Fabric, Building Footprints, All Points of Interest - Toronto Open Data

0 125 250 500 750 Metres

Project:	**New SmartTrack Stations**		
Figure Title:	**St.Clair-Old Weston SmartTrack Station - Land Use Designations Within the Study Area**		
Prepared By:	4TRANSIT PARSONS HATCH WSP	**Date: May 10, 2018**	
Version: CW.EPR.100-1	**Review:**	**Figure: 3-8**	

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3.5.2.2 *Neighbourhood Characteristics*

The Project is located within the Junction Area and Weston-Pelham Park neighbourhoods. These neighbourhoods are located within the Old City of Toronto, which now comprises the centre of the amalgamated City of Toronto.

The Junction Area neighbourhood is characterized by low to medium density forms of development. There is a large amount of commercial uses, particularly along St. Clair Avenue West, as well as significant industrial land uses. The Weston-Pelham Park neighbourhood is similar, and is home to additional industrial lands, as well as residential and commercial development. Both neighbourhoods have some intermittent higher density residential development interspersed throughout.

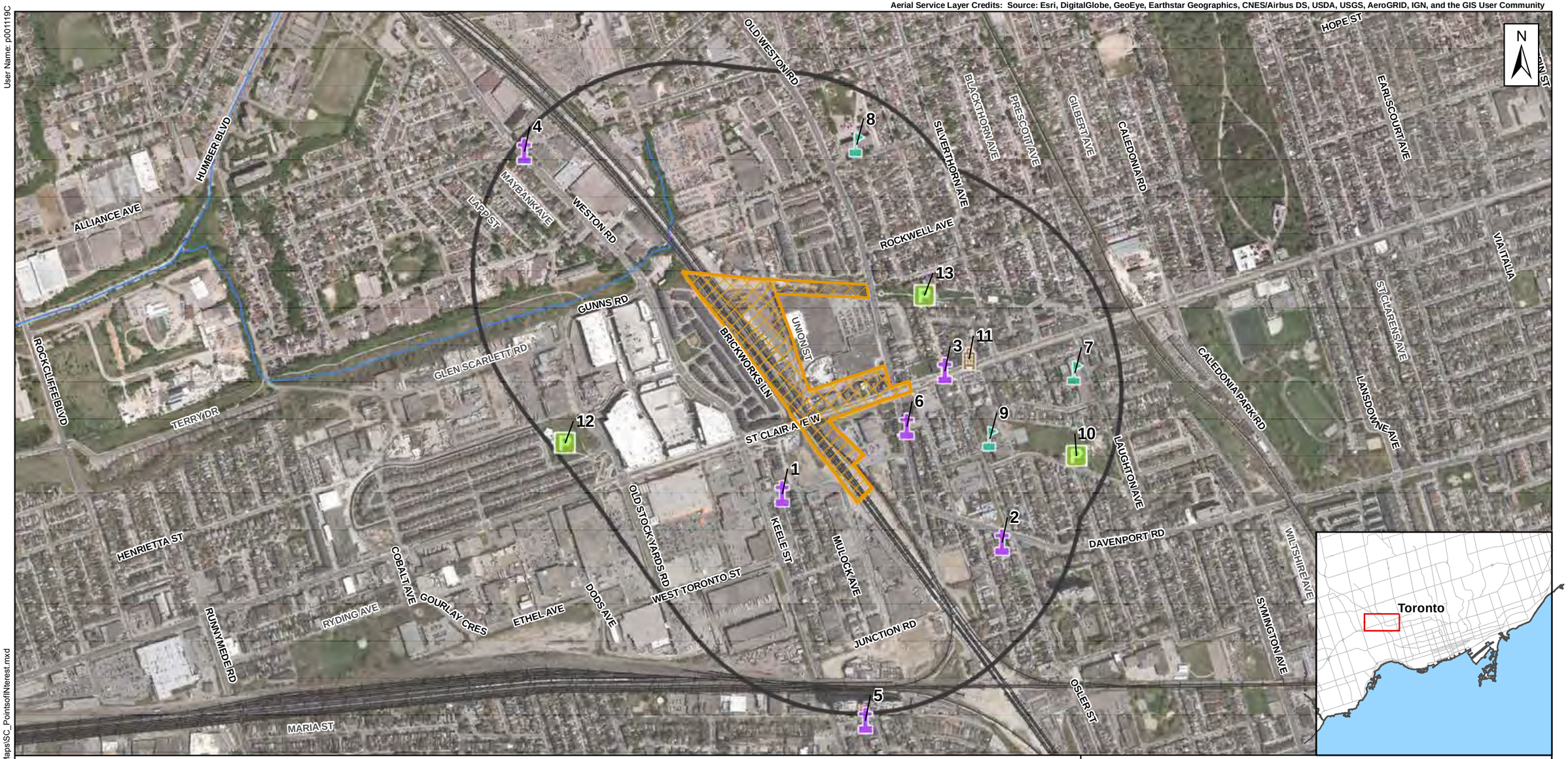
Table 3-4 summarizes some of the key features of the physical neighbourhood within the study area by category. These are also mapped on Figure 3-9.

Table 3-4: Key Features within the Study Area

Key Feature ID	Feature Type	Feature Name
1	Place of Worship (Institutional Use)	Ozanam House (worship)
2	Place of Worship (Institutional Use)	Newborn Church of God
3	Place of Worship (Institutional Use)	International Pentecostal
4	Place of Worship (Institutional Use)	La Luz De Cristo Pentecostal
5	Place of Worship (Institutional Use)	Riwoche Tibetan Buddist Temple
6	Place of Worship (Institutional Use)	Sri Guru Singh Sabha
7	School (Institutional Use)	Pope Paul VI Catholic Elementary School
8	School (Institutional Use)	General Mercer JPS
9	School (Institutional Use)	Carleton Village PS North
10	Recreational Uses	Wadsworth Park
11	Community Groups and Resources	St. Clair and Silverthorn Library
12	Recreational Uses	Maple Claire Park
13	Recreational Uses	S.A.D.R.A. Park
14	Recreational Uses	Upper Junction Park

User Name: p001119C

Aerial Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Study Area - 500 Metres
- Proposed Project Footprint (approximate)
- Permanent Watercourse
- Railway
- Community Groups and Resources
- Recreational Uses, Parks and Open Space
- Place of Worship
- School

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs

0 125 250 500 750 Metres

Project:	**New SmartTrack Stations**		
Figure Title:	**St.Clair-Old Weston SmartTrack Station - Key Features**		
Prepared By:	4TRANSIT PARSONS HATCH WSP	**Date: May 10, 2018**	
Version: CW.EPR.100-1	**Review:**	**Figure: 3-9**	

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3.5.2.3 *Aesthetics/Visual Character*

This area has the following characteristics in terms of built form:

i. Buildings are typically oriented toward the street.

ii. Buildings are set back from the street.

iii. Some older buildings have simple utilitarian designs with few windows, minimal architectural detailing, and blank walls facing the street.

iv. Where landscaped areas exist, they are provided along the street frontage.

v. Along St. Clair Avenue West, to the East of the Railway Corridor, low-density retail development with medium to minimal setbacks. The façade of this retail development is articulated to clearly define the ground-oriented commercial uses along the street.

vi. Along Union Street, to the East of the Railway Corridor, industrial sites arranged with large surface parking lots.

The area north of the Project footprint consists of residential and industrial uses. The industrial uses extend north beyond the study area towards Rogers Road.

The area east of the Project footprint consists of underdeveloped industrial lands, including the Toronto Flea Market. There are also low-density residential land uses, and some local commercial establishments.

The area south of the Project footprint is vacant industrial land, as well as some low density residential development.

The area west of the Project footprint consists of recently built townhomes and a commercial development (The Stockyards), as well as some other large format retailers.

The area along St. Clair Avenue West consists predominantly of commercial uses, as well as some light industrial and residential uses beyond the street frontage. The area at the corner of Mulock Avenue and St. Clair Avenue West is vacant land. The Delta Bingo and Gaming centre is located at St. Clair Avenue West and Old Weston Road. These areas will likely evolve over time. The overall built form along the roadways in the study area could be described as automobile oriented, with provisions for pedestrians along major roads, and minimal provisions for cyclists. The nature of the commercial land use appears designed to attract customers in automobiles, despite the adjacent transit service.

3.5.2.4 *Utilities*

The following owners of utility infrastructure located in the study area have been identified and are listed in Table 2-1 in Section 2.3.14.

3.5.2.5 *Current Development Applications*

Table 3-5 provides a description of active development proposals and applications in the study area at the time this EPR was written.

Table 3-5: Active Development Applications

Address File # Map ID	Application Summary	Application Status	Non-Residential Area (m²)
198 Old Weston Road *Site Plan Approval* *11 251721 WET 17 SA* MAP ID 1	Proposal to permit the construction of a two-storey, 50-unit industrial condominium development in three separate building blocks.	Under Review	Unknown
1779 St. Clair Avenue West *Site Plan Approval* *17 122730 WET 17 SA* MAP ID 2	Proposal for a 12 storey mixed use development containing a total of 274 residential units with a total gross floor area of 23,781m², the majority of which would be for residential uses, and the remainder for non-residential uses.	Under Review	1,000
1771 St. Clair Avenue West *Site Plan Approval* *16 133568 WET 17 SA* MAP ID 3	Proposal to construct a six storey, mixed-use building with commercial at grade and 72 residential dwelling units above. 53 total parking spaces would be provided, with 49 in a below-grade garage and 4 surface visitor spaces.	Under Review	Unknown
6 Lloyd Avenue *Official Plan Amendment* *13 278533 WET 11 OZ* MAP ID 4	Proposed amendments to the City's Official Plan to redesignate the north two-thirds of the lands from Employment Areas to Mixed Use Areas and establish a new Site and Area specific policy No. 447 over the entire site.	Under Review	Unknown
65 McCormack Street *Site Plan Approval* *13 200578 WET 11 SA* MAP ID 5	Proposed development of 3, free-standing industrial warehouse buildings Has appeal in on OPA 231.	Under Review	Unknown
1800-1818 St. Clair Avenue West and 383-425 Old Weston Road *Official Plan Amendment* *Zoning By-law Amendment* *18 135955 WET 17 OZ* MAP ID 6	Proposal to remove two buildings, remediate the Site, and introduce five low-rise blocks of stacked 3.5-storey townhouses, and an 11-storey retail and live-work-space fronting on to St. Clair Avenue West. A total of 242 residential units are proposed, of which 104 are townhouse units and 138 are mid-rise units. 20 of the 104 townhouse units will be developed as affordable ownership units in partnership with Habitat for Humanity Greater Toronto Area.	Under Review	Unknown

3.6 Air Quality

This section provides an overview of existing air quality conditions within the study area. Further details are provided in Appendix G of this Volume.

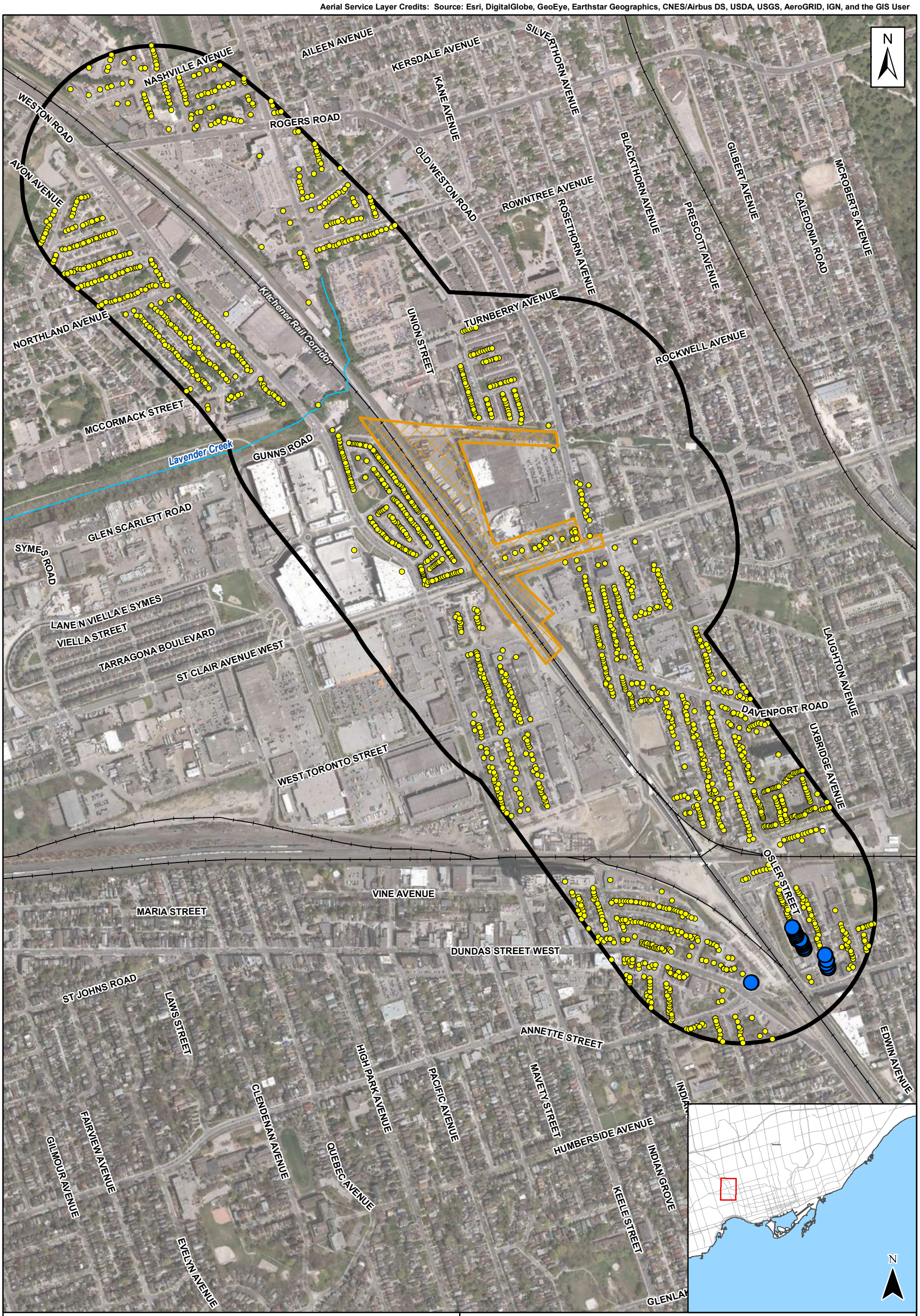
Refer to Section 4.7 for air quality effects assessment, mitigation and monitoring.

3.6.1 Methodology

The study area for the Air Quality Impact Assessment (AQIA) extends 1 km from the Project footprint in either direction along the Kitchener rail corridor and 300 m perpendicular to the rail corridor in either direction. Sensitive receptors within the study area are show in Figure 3-10.

Aerial Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

User Name: p007643C



Legend

- Study Area
- Proposed Project Footprint (approximate)
- Permanent Watercourse
- Railway

Receptors

- 20 Most Sensitive
- Sensitive

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs

0 50 100 200 300 Metres

Project:	**New SmartTrack Stations**
Figure Title:	**St. Clair-Old Weston SmartTrack Station - Air Quality Sensitive Receptors**
Prepared By:	4TRANSIT PARSONS HATCH WSP
Date:	**May 11 2018**
Version: CW.EPR.100-1	**Review:**
Figure:	**3-10**

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Local air quality effects were assessed by estimating contaminant concentrations resulting from the transit operations in three scenarios:

1. Current Scenario: conditions currently on the rail corridor (2017);
2. No-Build Scenario: 2028 horizon (future scenario) including electrification and Kitchener rail corridor expansion, but with no Project; and
3. Full Build Scenario: 2028 horizon (future scenario) including electrification, Kitchener rail corridor expansion and the Project.

For the three scenarios, the effects of the Project on sensitive receptors within the study area were determined.

The effects were compared to the Ontario Ambient Air Quality Criteria (AAQC) and the Canadian Ambient Air Quality Standards (CAAQS). The air quality thresholds represent desirable levels of contaminants in ambient air and are not enforceable within any of the jurisdictions.

The assessment was conducted using an emission rate calculation model. The local effects of all emissions were predicted using an air dispersion model. The United States Environmental Protection Agency's (US EPA) Motor Vehicle Emission Simulator (MOVES) model was used to determine vehicle emission rates for passenger cars in parking lots and PPUDO areas, and transit buses in lay-by areas. The American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) was used to determine the dispersion of the emissions associated with the three scenarios.

The potential for an adverse effect is considered to exist when the modelled concentration and the ambient background concentration summed for a contaminant exceeds the air quality threshold at a sensitive receptor. If the ambient background concentration of a contaminant already exceeds the threshold, then the potential for an adverse effect already exists, without considering the Project.

Concentrations of the Contaminants of Concern (COCs) resulting from background sources were estimated by analysing historical monitoring data from Environment and Climate Change Canada (ECCC) National Air Pollution Surveillance (NAPS) stations as well as MOECC air monitoring stations in the vicinity of the Kitchener rail corridor.

The 90th percentile background concentration for each COC was determined from the stations listed in Table 3-6. The 90th percentile over the five year data set is considered to be representative of ambient background conditions for averaging periods of 30 minutes, one hour, eight hours, and 24 hours. For COCs with an annual averaging period, the highest recorded annual mean over the five years of data from the designated ambient stations was used.

A credible worst-case analysis has been undertaken for this assessment. The contribution from the Project and the ambient background concentrations can vary from day to day, depending on meteorological conditions and operational characteristics. If the credible worst-case analysis indicates that a significant number of sensitive receptors may be subject to air quality that does not meet the air quality thresholds, then a more detailed analysis will be

conducted for that specific receptor/community (mitigation); otherwise, no further local air quality impact assessment is required (Ministry of Transportation, 2012).

Table 3-6: Air Monitoring Stations for Contaminants of Concern

Contaminant of Concern	Station ID	Station Name (Location)	Availability of Data
Particulate Matter ($PM_{2.5}$)	MOECC - 31103	Toronto Downtown	2012-2016
Nitrogen Dioxide (NO_2)	MOECC - 31103	Toronto Downtown	2012-2016
Ozone	MOECC - 31103	Toronto Downtown	2012-2016
Carbon Monoxide (CO)	MOECC - 35125	Toronto West (Resources Road)	2012-2016
Acrolein	NAPS - 60418	Perth/Ruskin (Junction Triangle)	2002-2006
Benzene, 1,3-Butadiene	NAPS - 60427	Toronto (223 College Street)	2008-2012
Acetaldehyde, Formaldehyde	NAPS - 64401	Egbert CARE	2006-2010
Benzo(a)pyrene	NAPS - 60427	Toronto (223 College Street)	2006-2010

3.6.2 Description of Existing Conditions

Table 3-7 summarizes ambient background concentrations within the study area.

24-hour benzo(a)pyrene and annual benzene and benzo(a)pyrene ambient background concentrations exceed the applicable air quality threshold. The elevated ambient background levels of these contaminants are a widespread occurrence across urban Ontario, and levels are desired to be decreased by the MOECC.

Table 3-7: Summary of Ambient Background Concentrations within the Study Area

Contaminant	Period	Unit	Background Value 90% Percentile	Criterion	% of criterion
$PM_{2.5}$	24-hour	$\mu g/m^3$	14	27	52%
$PM_{2.5}$	Annual	$\mu g/m^3$	8.8	8.7	99%
NO_2	1-hour	$\mu g/m^3$	49.1	83	59%
N	24-hour	$\mu g/m^3$	40.9	200	21%
NO_2	Annual	$\mu g/m^3$	27.7	24	115%
CO	1-hour	$\mu g/m^3$	441	36,200	1%
CO	8-hour	$\mu g/m^3$	424	15,700	3%
O_3	1-hour	$\mu g/m^3$	84.7	N/A	N/A
O_3	24-hour	$\mu g/m^3$	75.1	N/A	N/A
O_3	Annual	$\mu g/m^3$	52.6	N/A	N/A
Acrolein	1-hour	$\mu g/m^3$	-	4.5	-
Acrolein	24-hour	$\mu g/m^3$	0.2	0.4	59%
Benzene	24-hour	$\mu g/m^3$	1	2.3	45%
Benzene	Annual	$\mu g/m^3$	0.8	0.45	178%
1,3 Butadiene	24-hour	$\mu g/m^3$	0.099	10	1%
1,3 Butadiene	Annual	$\mu g/m^3$	0.053	2	3%
Acetaldehyde	30 minutes	$\mu g/m^3$	-	500	-
Acetaldehyde	24-hour	$\mu g/m^3$	1.4	500	0.30%
Formaldehyde	24-hour	$\mu g/m^3$	4.2	65	6%
B(a)P	24-hour	$\mu g/m^3$	0.000182	0.00005	364%
B(a)P	Annual	$\mu g/m^3$	0.000132	0.00001	1320%

***Notes**:*
Ozone (O_3) concentrations were used to calculate the NO to NO_2 conversion using the Ozone Limiting Method (See Section 2.5 in Appendix G of this EPR).
'-' : Insufficient data to estimate these values.

3.7 Noise and Vibration

This section provides an overview of existing noise and vibration conditions within the study area. Further details are provided in Appendix H of this Volume.

Refer to Section 4.8 for noise and vibration effects assessment, mitigation and monitoring.

3.7.1 Methodology

The study area for the Noise and Vibration Impact Assessment extends 300 m from the Project footprint. Sensitive receptors within identified Noise Sensitive Areas (NSAs) were selected based on the geographical and land use context and as per the Ministry of Environment and Energy (now MOECC)/GO Transit Draft Protocol for Noise and Vibration Assessment (1994) (the Protocol). Existing and predicted noise and vibration levels were assessed at sensitive receptor locations to characterize the effects of the Project and identify where mitigation is required. Further information on sensitive receptors is provided in Section 4.8.

A site visit was undertaken on August 11, 2017 to confirm the suitability of the selected NSAs and receptor locations.

Noise Sensitive Areas are shown in Figure 3-11. Noise level measurements and vibration measurements were taken along the rail corridor as shown in Figure 3-12.

Aerial Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

User Name: p007643C

LAVENDER ROAD
TERCEIRA CIRCLE
ALGARVE CRESCENT
OLD WESTON ROAD
ROSETHORN AVENUE
SILVERTHORN AVENUE
PRESCOTT AVENUE
Kitchener Rail Corridor
TURNBERRY AVENUE
ALENTEJO STREET
BRAGA GARDENS
CHAMBERS AVENUE
ROCKWELL AVENUE
BLACKTHORN AVENUE
CARRICK AVENUE
HOWICK AVENUE
MCCORMACK STREET
Lavender Creek
GUNNS ROAD
BRICKWORKS LANE
UNION STREET
BIRDSTONE CRESCENT
WESTON ROAD
TOWNSLEY STREET
CLOVERDALE ROAD
PRYOR AVENUE
HOUNSLOW HEATH ROAD
LANE E OSLER S ST CLAIR
LANE E FORD S ST CLAIR
OSLER STREET
FORD STREET
ST CLAIR AVENUE WEST
CONNOLLY STREET
LANE E OSLER N DAVENPORT
KEELE STREET
CAWTHRA AVENUE
DAVENPORT ROAD
MILLER STREET
LANE E KEELE S LLOYD
MULOCK AVENUE
HIRONS STREET
LANE E MULOCK S HIRONS
LANE E KEELE S HIRONS
OLD STOCK YARDS ROAD
ETHEL AVENUE
WEST TORONTO STREET
JUNCTION ROAD
LINDNER STREET
LANE N DUNDAS E QUEBEC
MCMURRAY AVENUE
QUEBEC AVENUE
VINE AVENUE
LANE N DUNDAS W PACIFIC
PACIFIC AVENUE
JACKSON PLACE
HEINTZMAN STREET
DUNDAS STREET WEST
Lake Ontario
N

Legend

- Study Area - 300 Metres
- Proposed Project Footprint (approximate)
- Permanent Watercourse
- Railway
- Existing Noise Sensitive Area
- Proposed Development Noise Sensitive Area

0 50 100 200 Metres

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs

Project:	**New SmartTrack Station**
Figure Title:	**St. Clair-Old Weston SmartTrack Station - Noise Sensitive Area**
Prepared By:	4TRANSIT PARSONS HATCH WSP
Date:	**March 26 2018**
Version: CW.EPR.100-1	**Review:**
Figure:	**3-11**

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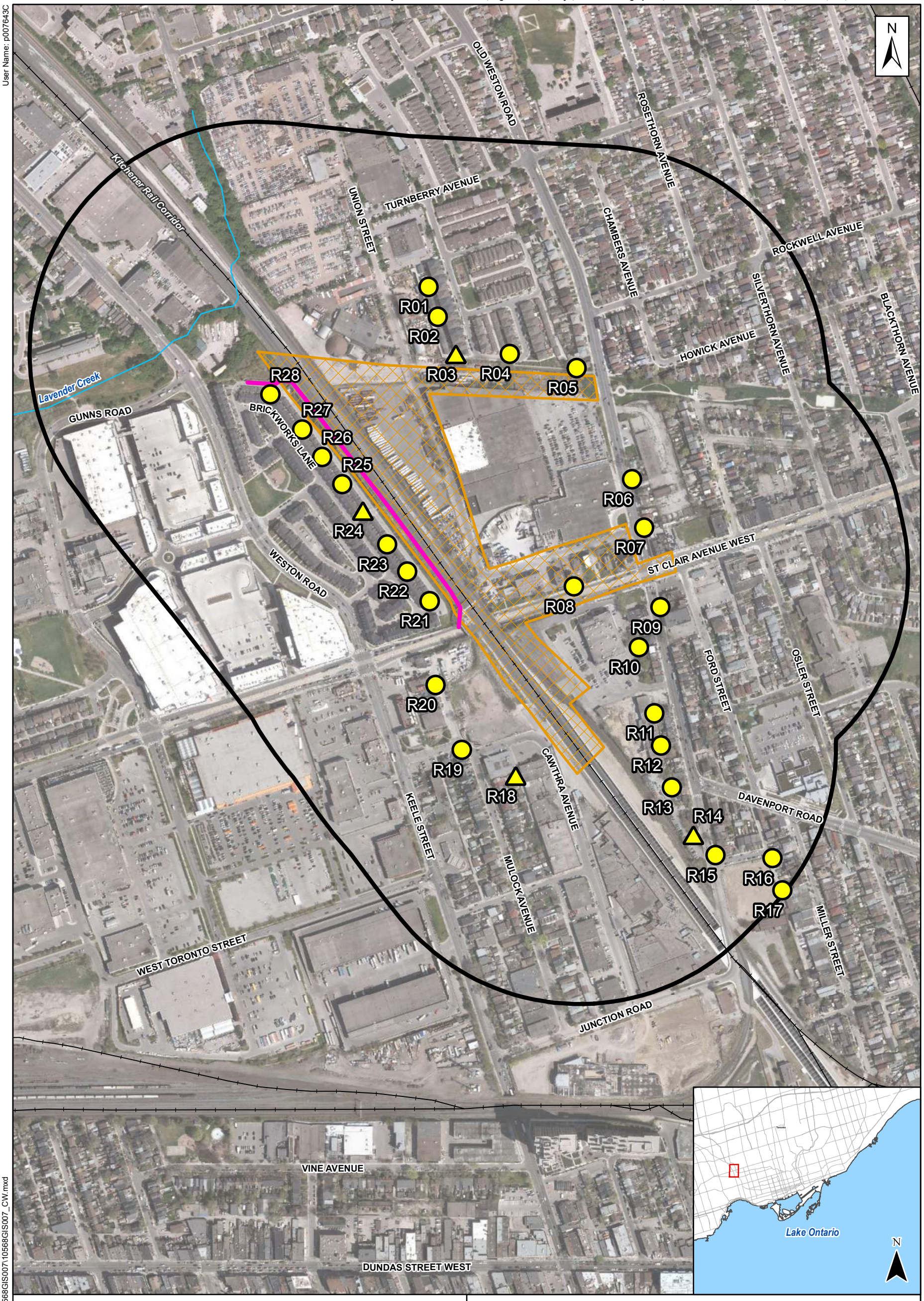
Aerial Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

User Name: p007643C



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Legend

- Study Area - 300
- Proposed Project Footprint (approximate)
- Permanent Watercourse
- Railway
- Existing Noise Barriers
- Monitor
- Receptor

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs
Receptor Data - Parsons

0 50 100 200 Metres

Project:	**New SmartTrack Station**		
Figure Title:	**St. Clair-Old Weston SmartTrack Station - Noise and Vibration Sensitive Receptor Locations**		
Prepared By:	4TRANSIT PARSONS HATCH WSP	**Date:**	**May 11 2018**
Version: CW.EPR.100-1	**Review:**	**Figure:** 3-12	

Noise monitoring was conducted at four representative locations to determine the existing ambient noise levels in the proximity of the subject site and to confirm the accuracy of the noise model. Two locations were located along the north side of the rail corridor, and two were located along the south side of the rail corridor.

The following scenarios formed part of the assessment:

- Scenario 1, existing conditions;
- Scenario 2, future conditions without Project (no-build condition), which consists of year 2028 future diesel and electric train volumes, but without the station; and
- Scenario 3, future conditions with Project (future build condition), which consists of year 2028 future diesel and electric train volumes, plus the proposed station.

The review of construction noise is based on the *Noise Pollution Control Publication 115* (NPC-115) and NPC-118 (part of the *MOE Model Municipal Noise Control By-law* (Ministry of the Environment, 1978)), the United States Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment* (Federal Transit Administration, 2006) and the City of Toronto *Municipal Code Chapter 591 - Noise* (City of Toronto, 2009).

NPC-115 stipulates specific sound emission standards for various pieces of construction equipment. This publication does not set receptor-based sound level limits due to construction activities but rather sets limits for noise generated by each individual piece of equipment. Table 3-8 lists maximum noise emission levels for typical construction equipment.

Table 3-8: NPC-115 Maximum Noise Emission Levels for Typical Construction Equipment

Type of Equipment	Quiet Zone Maximum Sound Level (dBA)	Residential Area Maximum Sound Level (dBA)	Distance (m) [3]	Power Rating (kW)
Excavation Equipment [1] (January 1, 1981 and later)	83	83	15	< 75
	85	85	15	75 ≤
Pneumatic Equipment [2]	85	85	7	-
Portable Compressors (January 1, 1981 and later)	70	76	7	-

(1) Excavation equipment includes bulldozers, backhoes, front end loaders, graders, excavators, steam rollers and other equipment capable of being used for similar applications.
(2) Includes pavement breakers.
(3) Distances based on NPC-103 Procedures (Section 6, 7 and 9).

NPC-118 sets sound emission standards for motorized conveyances of various types. This publication does not set receptor-based sound level limits due to heavy vehicle operation but sets limits for noise generated by each individual piece of equipment. Table 3-9 lists maximum noise emission levels for standard diesel heavy vehicles.

Table 3-9: NPC-118 Maximum Noise Emission Levels for Standard Diesel Heavy Vehicles

Date of Manufacture	Maximum Sound Level (dBA)	Distance (m)
Prior to January 1, 1979	100	15
January 1, 1979 and after	95	15

Key elements of the City of Toronto Noise By-law *(Municipal Code - Chapter 591: Noise)* (City of Toronto, 2009) related to construction activities include By-law No. 1400-2007 (Construction Noise) (City of Toronto, 2009) and place limits on the timing of construction activity during nighttime and on Sundays and statutory holidays. The FTA *Transit Noise and Vibration Impact Assessment* guide (Federal Transit Administration, 2006) includes receptor-based 90 dBA one-hour L_{eq} day-time and 80 dBA one-hour L_{eq} night-time construction noise criteria for residential land uses. It should be noted that these noise levels cannot be enforced in Canada; however, the FTA criteria can be used to help gauge whether construction noise levels at the receptor level are acceptable or not.

There are no federal or provincial construction vibration limits. Vibration levels due to construction are governed municipally, on the basis of the City of Toronto By-law No. 514-2008 (Construction Vibration) (City of Toronto, 2008). As per the By-law, if any structures fall within the Zone of Influence (ZOI), construction vibration monitoring will be undertaken to ensure that the vibration levels are never exceeded. The ZOI is defined as the area of land adjacent to or within the construction site, delineated at a Point of Reception where the Peak Particle Velocity (PPV) is measured to be greater or equal to 5 mm/s. Table 3-10 lists the City of Toronto prohibited vibration limits.

Table 3-10: City of Toronto Prohibited Vibration Limits

Frequency of Vibration (Hz)	Vibration Peak Particle Velocity (mm/s)
Less than 4	8
4 to 10	15
More than 10	25

The operations noise assessment is based on the Protocol. An objective of the Protocol is that the daytime (i.e., 07:00 to 23:00 hours) Equivalent Continuous Sound Level, L_{eq} (16 hrs), produced by future rail service operation of the GO Transit project under assessment, does not exceed the higher of:

a. The ambient sound level (combined with the sound level from existing rail service); or

b. 55 dBA.

The Protocol also has an objective that the night-time (i.e., 23:00 to 07:00 hours) L_{eq} (8 hrs) produced by the future rail service operation of the GO Transit project does not exceed the higher of:

a. The ambient sound level (combined with the sound level from existing rail service); or

b. 50 dBA.

To assess the impact at a Point of Reception, the Adjusted Noise Impact level is used. The Adjusted Noise Impact level is the difference in sound level between pre-project and post-project noise. In accordance with the Protocol, if the difference in sound level is 5 dB or higher, the potential to mitigate will be evaluated based on administrative, operational, economic, and technical feasibility.

Table 3-11 summarizes the adjusted noise impact rating and mitigation requirements.

Table 3-11: Summary of Impact Rating and Action of Mitigation

Change in Noise Level	Impact Rating	Mitigation Effort Required
0 to 2.99 dB	Insignificant	None
3 to 4.99 dB	Noticeable	None
5 to 9.99 dB	Significant	• Investigate the potential of noise control measures to mitigate based on administrative, operational, economic and technical feasibility • If deemed feasible, the mitigation measures shall ensure that the predicted sound level from the GO transit rail project is as close to, or lower than, the rail service objective.
10+ dB	Very Significant	

The review of stationary noise is based on the NPC-300. The effects of stationary noise sources related to the Project, such as the public-address system and ancillary equipment, shall meet the requirements outlined in NPC-300. NPC-300 presents sound level limits based on type of land use and type of stationary sound. The relevant criteria based on the project setting and type of stationary noise produced by the Project are summarized in Table 3-12.

Table 3-12: NPC-300 Stationary Noise Assessment Criteria

Time of Day	Exclusion Limit Values of One-Hour Equivalent Sound Level (L_{eq}, dBA)[1]	
	Outdoor	Plane of Window
07:00 - 19:00	50	50
19:00 - 23:00	45	50
23:00 - 07:00	--	45

1 - The sound level limit at a point of reception is the higher of the applicable exclusion limit value given, or the background sound level.

The vibration assessment is also based on the Protocol. Under the Protocol, the desirable objective is that the Root-Mean-Square Velocity (RMSV) produced by the Project does not exceed 0.14 mm/s. However, if the existing vibration levels are above 0.14 mm/s, the future vibration velocity objective is to be no greater than existing vibration levels.

When the vibration velocity at the Point of Reception exceeds the objective by 25 percent, vibration control measures should be investigated within the constraints of administrative, aesthetic, economic and technical feasibility.

3.7.2 Description of Existing Conditions

Table 3-13 summarizes the noise monitoring locations and corresponding results.

Table 3-13: Summary of Noise Monitoring Results

Receptor	Address	Day-time L_{eq},16 (dBA)	Night-time L_{eq},8 (dBA)
R3	78 Alentejo Street	53	46
R14	218 Old Weston Road	61	54
R18	133 Mulock Avenue	55	48
R24	89 Brickworks Lane	63	56

The measured sound levels at select receptors were above the 55 dBA daytime and 50 dBA nighttime limits outlined in the Protocol.

Table 3-14 summarizes the vibration monitoring locations and corresponding results.

Table 3-14: Summary of Vibration Monitoring Results

Receptor	Address	RMS Vibration Velocity (mm/s)
R3	78 Alentejo Street	0.05
R14	218 Old Weston Road	0.06
R18	133 Mulock Avenue	0.05

As illustrated in the table above, the measured vibration levels are below 0.14 mm/s.

There is an existing 3 m high noise barrier which provides shielding to the residential row houses along Brickworks Lane. The location of this barrier was confirmed during a site visit. No additional noise barriers were proposed by the GO Rail Electrification project within the Project vicinity. Therefore, there are no barriers associated with the GO Rail Electrification included in the future noise modelling. All the modeled scenarios include the specified existing noise barriers, as well as building features which provide shielding at the representative receptor locations.

3.8 Traffic and Transportation

This section provides an overview of existing traffic and transportation conditions within the study area and the methodology used to obtain this information. Further details are provided in Appendix I of this Volume.

Refer to Section 4.9 for traffic and transportation effects assessment, mitigation and monitoring.

3.8.1 Methodology

The transportation study was developed based on the following methodology:

- Review of relevant background reports to gather information about the existing and future planned conditions within the study area and the surrounding roadway networks, including background information from the City of Toronto, Metrolinx and TTC, standards and guidelines from relevant municipalities, and traffic; and
- Following the principles of transportation/traffic analysis theories, best practices and professional engineering judgement to identify issues and evaluate solutions.

As part of a typical methodology for an analysis of this nature, a site visit would be conducted in order to gain a “hands on” perspective of the existing transportation and traffic conditions,

and then to serve as input for the analysis of the future conditions. However, since the future conditions for the St. Clair-Old Weston SmartTrack Station are anticipated to be very different from existing conditions due to the planned implementation of TMP recommendations, the value that can be obtained from observing the existing conditions through a site visit is limited. Therefore, a site visit was not conducted.

The following is a list of relevant background information that has been reviewed as part of this study. The understanding of the existing and future conditions within the study area and the surrounding roadway network is further described in Appendix I of this Volume.

- The City of Toronto Zoning By-law (By-law 569-2013) (2016);
- The City of Toronto Official Plan (2015);
- RER New Stations Initial Business Case - St. Clair West (Kitchener Corridor) (2016);
- GO Regional Express Rail 10-Year Program: New Stations Analysis (2016);
- The City of Toronto's 10-Year Cycling Network Plan (2016);
- St. Clair West Avenue Study (Keele to Glenholme) (2009);
- St. Clair Avenue West Area Transportation Master Plan (Ongoing); and
- St. Clair Avenue West at the Georgetown GO Underpass - Transportation Infrastructure Planning Study (2015).

A Transportation Brief was developed to focus on identifying the number of multi-modal trips and critical movements at the adjacent intersections generated by the station.

The new stations proposed within the core of the City of Toronto, including the St. Clair-Old Weston SmartTrack Station, are all within highly urbanized areas. As no parking is to be provided, most people will walk, cycle or take public transit to/from the station. The station will be located west of the intersection of St. Clair Avenue West and Old Weston Road in a rapidly growing area, which contains a mix of residential and employment areas. Nearby transit, pedestrian and cycling access is available to local developments and along St Clair Avenue.

Given the medium density local development and the availability of easy walking/cycling and transit access, there is likely to be limited PPUDO access to or from the station. This is confirmed by the current activity at similar existing GO Transit stations within the outer downtown area. In addition, many PPUDO trips are likely to be pass by in nature and are existing trips with the added feature of dropping or picking up someone at the station.

Table 3-15 presents A.M. and P.M. peak hour 2031 forecasted ridership volumes which were provided by the City of Toronto's Planning team.

Table 3-15: St. Clair-Old Weston SmartTrack Station Boarding and Alighting Data (from City of Toronto)

Peak Hour	Total Boardings	Transfer Boardings	Total Alightings	Transfer Alightings
A.M.	630	220 (34.9%)	40	0 (0%)
P.M.	80	10 (12.5%)	440	100 (22.7%)

The mode split and trip distribution information were obtained from Metrolinx's GO Rail Station Access Plan (Metrolinx, 2016). The PPUDO mode splits for the A.M peak alighting and P.M. peak boarding periods have been reduced to zero for this analysis, to reflect the idea that PPUDO activities will not occur during these periods. The trips forecasted to be generated by this mode have been proportionally reallocated to the walking, local transit, and cycling modes during these periods. Additionally, it is assumed that the 2031 forecasted targets are identical to the 2028 future year targets (the opening of the station), to be conservative.

In addition, the Metrolinx's GO Rail Passenger Survey Report (GO Transit, 2016), and data extracted from the 2011 Transportation Tomorrow Survey (TTS) were reviewed. Further details are included in Appendix I of this Volume.

3.8.2 Description of Existing Conditions

3.8.2.1 Road Network

The study area contains the following key corridors; all which are all under the jurisdiction of the City of Toronto:

- Arterials - St Clair Avenue West, Weston Road/Keele Street, and Old Weston Road;
- Collector - Gunns Road; and
- Locals - Union Street/Townsley Street, and Turnberry Avenue.

Functional details of these roadways are provided in the Appendix I of this Volume.

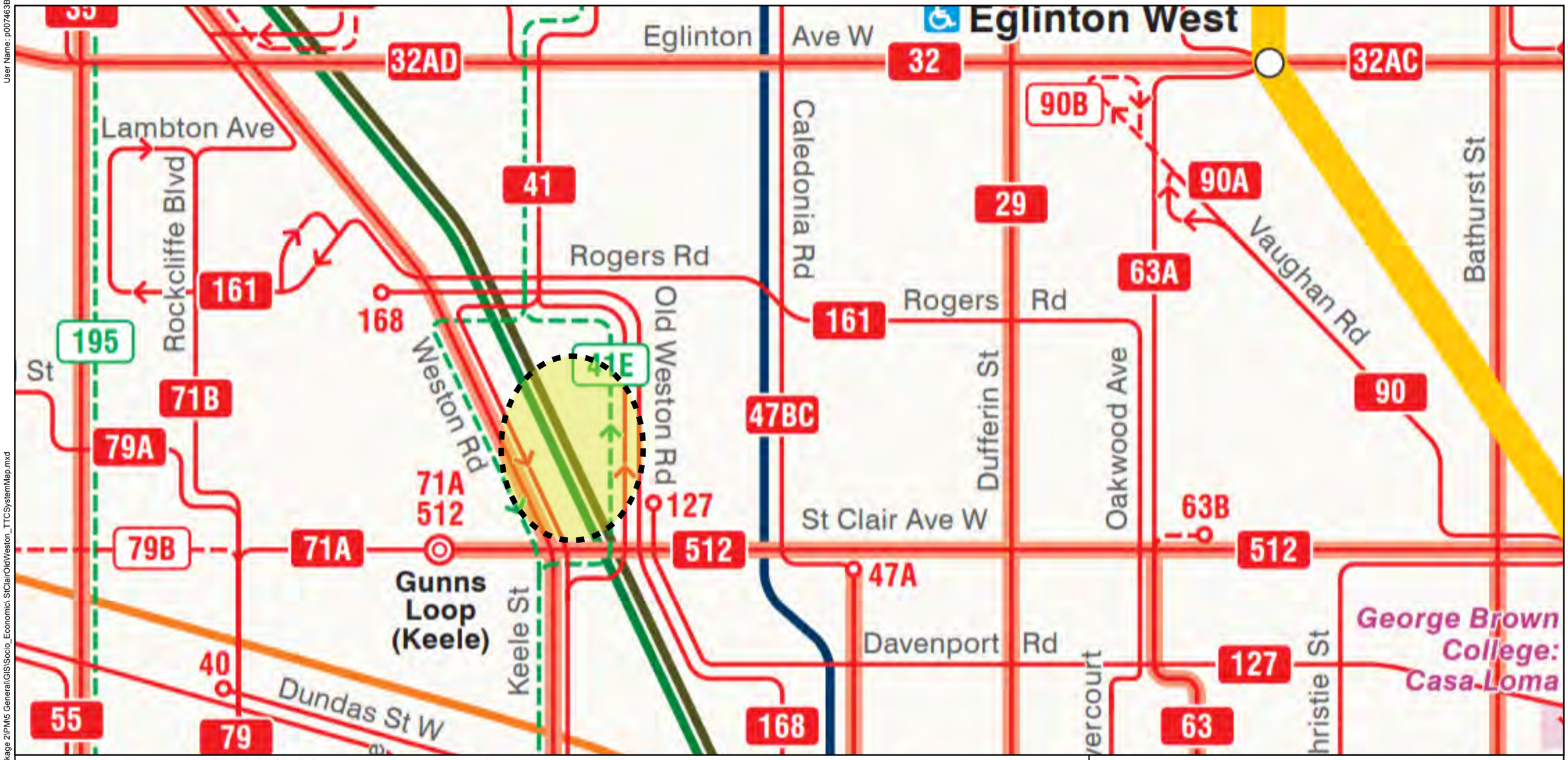
The key intersections examined for this study include:

- Union Street and Townsley Street (with the extension of Davenport Road): is currently an unsignalized intersection; future T-intersection configuration is unknown at this time;
- Union Street and Turnberry Street (with the extension of Gunns Road): is currently a two-way stop-controlled T-intersection; future four-leg configuration is unknown at this time; and
- Gunns Road extension and Keele Street extension: is a proposed T-intersection; specific configuration is unknown at this time.

3.8.2.2 Transit Network

The Project would be situated on the Kitchener GO rail corridor between Bloor GO Station (2.2 km to the southeast) and Weston GO Station (4.9 km to the northwest).

The TTC serves the study area and the broader surrounding areas. As the station site is located in an intensifying area with both high-density residential and employment uses, connectivity from local transit services is of great significance. St. Clair Avenue West, Weston Road/Keele Street and Old Weston Road operate as key transit service routes in the study area. Service details of the local routes are included in Appendix I of this Volume. Figure 3-13 shows existing TTC routes in the study area.



Legend

Subway
- 1 Yonge-University Line
- 2 Bloor-Danforth Line
- 3 Scarborough Line
- 4 Sheppard Line

Regular station · Interchange station · Intermodal station · Accessible station

Streetcars and buses

Direction of travel · Routing details · Route number · Multiple branches · Additional fare required · Termination point

Local service · Express service

Ten-Minute Network

Regular service

Limited service

Community Bus

Map symbols
- Streetcar terminal loop
- Commuter rail station
- Airport
- Hospital
- Point of interest
- Transportation/government
- Post-secondary school
- Park
- Additional fare required

Approximate Study Area Boundary

DATA SOURCES:

TTC System Map - TTC
Sudy Area Boundary (approximate) - Initial Preferred Designs

Project:	**New SmartTrack Stations**		
Figure Title:	**St.Clair-Old Weston SmartTrack Station - TTC Routes**		
Prepared By:	4TRANSIT PARSONS HATCH WSP	**Date: May 10, 2018**	
Version: CW.EPR.100-1	**Review:**	**Figure: 3-13**	

3.8.2.3 Cycling, Pedestrian and Trail Network

Based on review of the City's 10-Year Cycling Plan, and desktop analysis of the boundary road network, there is no substantial existing cycling infrastructure in the study area. Details are included in Appendix I of this Volume.

Sidewalks provide pedestrians with enhanced connectivity throughout the study area. The existing pedestrian network is well connected, providing sidewalks on both sides of the street and other informal pedestrian pathways for the majority of roadways in the study area. Appendix I of this Volume provides details on the locations that feature intermittent sidewalks or no sidewalks along the study's key corridors.

4. Effects Assessment, Mitigation and Monitoring

4.1 Methodology

The methods used to conduct the effects assessment were designed to meet the requirements of the TPAP. During the process the following was considered:

- The key activities associated with the construction and operation of the Project as defined in the IPD and detailed in Section 2 of this Volume;
- Existing environmental conditions of the study area as detailed in Section 3 of this Volume; and
- Issues raised by the public, stakeholders and Indigenous communities during consultation and engagement activities conducted to date and detailed in Volume 8.

Potential environmental effects resulting from the construction and operation of the Project were identified, analyzed, and described. Mitigation measures were then identified to minimize or avoid potential effects. Monitoring activities were also identified where warranted to evaluate effectiveness of proposed mitigation measures and provide feedback for adaptive management.

Where applicable, relevant methodologies undertaken are discussed in this section.

Volume 8 of this EPR includes a specific discussion on climate change as it pertains to the Transit project.

4.2 Natural Environment

4.2.1 Overview

The Project has the potential to result in temporary (e.g., effects to wildlife due to anticipated vegetation removals) and permanent (e.g., long term colonization and spread of invasive species) effects to the natural environment. Potential effects associated with this Project may result from direct loss of habitat as well as indirect and accidental effects resulting from construction, and operations/maintenance activities.

It is anticipated that effects can be mitigated through implementation of well-established and site-specific mitigation measures. The Vegetation Compensation Protocol for Metrolinx RER Projects will be implemented for the Project.

4.2.2 Potential Effects, Mitigation and Monitoring Measures

Potential effects, corresponding mitigation measures and monitoring activities relating to the natural environment are described in Table 4-1.

Further details on potential effects, mitigation and monitoring are provided in Appendix B of this Volume.

Table 4-1: Natural Environment - Potential Effects, Mitigation and Monitoring

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
Construction			

Aquatic Environment	• Effects to Lavender Creek are anticipated to be minimal given that no works are proposed in the area of the watercourse. Effects associated with the proposed works will be limited to indirect effects of construction activities which may include:
	  • Erosion and downstream transport of sediment associated with staging areas, including exposed soils, stockpiled soils or other materials from clearing and grubbing;
	  • Entry of debris from the rail corridor during construction (e.g. aggregate) into the creek;
	  • Trampling of riparian vegetation;
	  • Equipment leaks, or spills may occur.
	• Lavender Creek is a warm water tributary, which is tolerant to disturbance and thermal fluctuations. The indirect and temporary effects associated with the construction of the Project can be managed using appropriate mitigation measures provided.
		Potential effects from the construction of the new station to the aquatic environment can be managed through implementation of the following mitigation measures:
		• Ensure equipment and materials storage through the construction and operations periods are located in designated and properly contained areas located well away from the watercourse;
		• Develop an Erosion and Sediment Control (ESC) Plan prior to construction for implementation throughout construction. The ESC Plan will include consideration of the Greater Golden Horseshoe Area Conservation Authorities' Erosion and Sediment Control Guideline for Urban Construction and OPSS 805 (Erosion and Sediment Control Measures). This plan will encompass all areas of soils disturbance, particularly in the vicinity of the Lavender Creek. The ESC plan described for soils mitigation will include the following measures:
		  • All disturbed areas/construction zones that drain to the watercourses will be isolated using standard perimeter ESC fencing to isolate the general construction zone up and downstream. The ESC fencing will be heavy duty/reinforced fencing, but with no exposed mesh that might entangle wildlife.
		• Locate all salvaged or stockpiled materials a safe distance from the edge of the watercourse and stabilize to prevent migration of any sediment or other material to the watercourse.
		• Stabilize and re-vegetate all work areas or other disturbed surfaces draining to the watercourse and/or in the floodplains as soon as feasible following construction as described above.
		• No equipment shall ford or otherwise enter the watercourse.
		• Control all activity to prevent entry of any
			• On-site inspection and maintenance by an Environmental Inspector will be undertaken on a regular basis (e.g., monthly) or as required (e.g., following storm events) over the course of construction to ensure the effectiveness of ESC measures and other mitigation measures.

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
		petroleum products, debris or other potential contaminants/deleterious substances, in addition to sediment as outlined above, to the watercourses. Conduct storage, refueling or maintenance of equipment at least 30 m away from the watercourse. An Emergency Preparedness and Response Plan will govern spill response. • Retain and protect as much of the natural vegetation as reasonably possible to help ensure bank stability and control erosion, and to expedite the re-colonization of native plant species as prescribed. • During detailed design and prior to construction, a Stormwater Management Report will be completed to determine potential effects and mitigation measures. The report will be completed in consultation with TRCA and the MOECC. Stormwater management design will consider guidance provided by the MOECC Stormwater Management Planning and Design Manual (2003), MTO Drainage Management Manual (2008), TRCA Storm Water Management Criteria (2012), and the Low Impact Development Stormwater Management Planning and Design Guide (TRCA/Credit Valley Conservation, 2010). • Conduct staging, storage, refueling and maintenance of equipment at least 30 m away from the watercourse and outside of floodplain areas. • A Flood Contingency Plan will be developed during detailed design and prior to construction. • Identify the need for flood contingency measures where flood plain areas exist.	
Terrestrial Environment	• Both direct and indirect effects to the terrestrial environment are anticipated from construction of the Project. • Direct effects from vegetation removal, which is anticipated to be	Potential effects to vascular flora and vegetation communities from construction of the Project can be managed through implementation of the following mitigation measures: • Retain existing vegetation within the study area to the extent practicable. Vegetation removal will	• On-site inspection and maintenance by an Environmental Inspector will be undertaken on a regular basis (e.g., monthly) or as required (e.g., following storm events) over the course of construction to ensure the

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
	minimal based on the developed/commercial nature of the study area, are anticipated. Much of the vegetation is early successional and disturbance tolerant species. Removals will likely affect some young to mid-aged trees located within the rail corridor. Removal of non-woody vegetation within cultural meadow units is also expected. The vegetation communities within the study area are considered common and widespread across the broader landscape, and no sensitive species were observed. The anticipated vegetation community loss based on the IPD has been estimated as: • Deciduous forest no anticipated vegetation loss • Cultural woodland 0.31 hectares • Cultural meadow 0.07 hectares • There is potential for indirect effects to adjacent retained vegetation features during the construction phase, including the following: • Vegetation clearing/damage beyond the construction area (e.g., due to air emissions and dust deposition); • An increase in downstream runoff that can result in erosion effects on receiving vegetation; • Colonization and spread of invasive species; and • Spills of fuel and/or application of other hazardous materials (e.g. de-icing substances during winter months) could occur. Spills have the potential to affect retained vegetation.	be kept to a minimum, limited to within the construction disturbance area and should be scheduled to occur outside of the overall bird nesting season of April 1 to August 31, following the mitigation measures described for migratory birds. • Areas for vegetation removal will be refined during detailed design, if required (e.g., change in construction disturbance area, final staging areas). • ESC fencing will be installed (as noted above) prior to vegetation clearing, and maintained throughout construction. • Construction fencing and/or ESC fencing, where appropriate, will be installed and maintained to clearly define the construction disturbance area and prevent accidental damage to vegetation, or intrusion to adjacent vegetated areas. Fencing will be monitored and repaired as necessary throughout the construction period and will be removed and disposed of accordingly, post-construction. • Re-stabilize all disturbed areas, incorporating re-vegetation using plantings and native seed mix appropriate to the site conditions. Exposed soils will be revegetated as soon as possible to reduce erosion. • Carry out clearing, grubbing, site preparation and tree protection activities with consideration for relevant OPSS (e.g., OPSS 201, (Ministry of Transportation, 2011) OPSS 801.PROV (Ministry of Transportation, 2018)). When practicable, prune or top the vegetation instead of grubbing/uprooting, if required. • Implement dust control practices (e.g., wetting with water) in dust-sensitive areas. • Any damaged trees will be pruned or removed through the implementation of proper arboricultural techniques, under supervision of an Arborist. • Mitigation measures specific to trees will be	effectiveness of ESC measures and other mitigation measures. • On-site inspection will be undertaken as required during construction to ensure that only specified trees are removed, fencing is intact and there is no damage caused to the remaining trees and adjacent vegetation communities. Construction and/or ESC fencing will be repaired if it is damaged. Any damaged trees will be pruned through the implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. • Regular inspections of dust emissions, (frequency to be defined prior to project construction), will be undertaken to confirm dust control watering frequency and rates are adequate. • Post-planting monitoring of restoration areas for one year after installation. One site visit will be conducted during the subsequent growing season to confirm survival of plantings and/or seed mix. Should the plantings and/or seed mix not survive, additional seeding and/or plantings will be undertaken one year thereafter with one additional monitoring visit in the following growing season. • Restoration/compensation monitoring will be confirmed through regulatory agency consultation during detailed design. • Additional restoration/compensation monitoring may be required based on the results of additional surveys and consultations with regulatory agencies.

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
		adhered to, including municipal by-law permitting requirements where applicable, that are summarized in the Project Tree Inventory Plan (Appendix C of this Volume). The Tree Inventory Plan will be further detailed in an Arborist Report. The Arborist Report will contain at a minimum the following information in addition to details of tree location, size, species, conditions and category: • Recommendations for tree/vegetation protection and preservation measures for all trees/vegetation that are to be retained; • Details of tree pruning; • Details of all trees/vegetation recommended for removal, including removal measures; • Mitigation and monitoring measures to ensure success of preservation and removal measures; • Should vegetation compensation be required, it will be in accordance with the Metrolinx Vegetation Compensation Protocol; and • Mapping. • Remove and dispose of all construction-related debris following construction in appropriately designated areas, which will be determined during detailed design. • Metrolinx is establishing a Vegetation Compensation Protocol for Metrolinx RER projects and vegetation that is removed will be compensated for in accordance with the provisions of this protocol: • **For Municipal/Private Trees**: Metrolinx will work with each municipality to develop a municipality-wide streamlined tree permitting/compensation approach for municipal and private trees. The goal is to reduce the administrative permitting burden for trees along long stretches of rail corridor. • **For Trees within Metrolinx Property**:	

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
		Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing trees community types/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final compensation plan. • **Conservation Authorities**: For vegetation removals within Conservation Authority lands where required, applicable removal and restoration requirements will be followed. • **Federal Lands**: For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements will be followed. • **Tree End Use**: Metrolinx will develop options for the end use of trees removed from Metrolinx property (e.g., reuse/recycling options). • Machinery is to arrive on site in a clean condition in accordance with the Clean Equipment Protocol for Industry. • Soil stockpiles will be managed in accordance with the Soil Management Plan as per above. Re-stabilize disturbed areas, incorporating re-vegetation using plantings and/or native seed mix appropriate to the site conditions. Ash trees, leaves, logs, or wood chips will not be removed out of the Regulated Area, as identified on the Canadian Food Inspection Agency (CFIA) website (CFIA, 2015). This is necessary to prevent the spread of the Emerald Ash Borer (EAB) to un-infested areas in Ontario. The Contractor must dispose of all wood at a registered Waste Facility. • Control all activity to prevent entry of any petroleum products, debris or other potential contaminants/deleterious substances, in addition	

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
		to sediment as outlined above, to the watercourses. Conduct storage, refueling or maintenance of equipment at least 30 m away from the watercourse. An Emergency Preparedness and Response Plan will govern spill response. • Restoration/compensation will be confirmed through regulatory agency consultation during detailed design. • Engagement with the TRCA on natural heritage enhancement opportunities will continue through detailed design. • Additional restoration/compensation measures may be required based on the results of additional surveys and consultations with regulatory agencies. • Efforts should be made to coordinate with Toronto Hydro, Toronto Water and other utility companies that may be affected by utility relocations to help minimize the overall impacts of the Project on the natural heritage system. • Infrastructure and utility works will either be completed by Metrolinx as part of this Project, or by utility companies. Metrolinx and its Contractors will follow TRCA regulatory requirements.	
Wildlife	• Effects to wildlife are expected to be minimal given the urban nature of the study area, and that no critical habitats have been identified. The majority of the species utilizing the study area are generally common, disturbance-tolerant urban wildlife species. • Wildlife may be directly affected due to anticipated vegetation removals as a result of construction. This vegetation could provide habitat for common urban wildlife and can be expected to provide nesting habitat for birds. Birds nesting in these areas	The mitigation measures outlined above to protect the terrestrial environment will also protect associated wildlife habitat functions. It is also necessary to ensure the protection of breeding birds and other animals that may nest or otherwise be encountered incidentally where construction is proposed. For the protection of wildlife in general, the following measures are recommended: • Any wildlife incidentally encountered during construction will not be knowingly harmed and will be allowed to move away from the construction area on its own if at all possible.	• On-site inspection will be undertaken as required during construction to ensure that only specified trees are removed, fencing is intact and there is no damage caused to the remaining trees and adjacent vegetation communities. Construction and/or ESC fencing will be repaired if it is damaged. Any damaged trees will be pruned through the implementation of proper arboricultural techniques, under supervision of an Arborist or Forester. • Regular inspections of dust emissions (frequency to be defined prior to project construction) will be undertaken

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
	may be protected by the MBCA. • However, as outlined above, there will be direct vegetation removals within the Project footprint and the wildlife habitat associated with these communities will therefore also be removed. These vegetation communities provide habitat that supports common urban tolerant species. • There is potential for wildlife (e.g., snakes, small mammals, etc.) to enter the proposed work areas. The majority of the wildlife species with potential to occur in the study area are common, tolerant species, and to which effects can be managed through the implementation of the mitigation measures. • Dust and noise created by the construction activities may also temporarily disturb and displace wildlife present within the study area. These wildlife species are likely accustomed to noise given the urban nature of the study area.	• In the event that an animal encountered during construction does not move from the construction zone, or is injured, the Environmental Inspector will be notified. • Implement dust control practices (e.g., wetting with water) in dust-sensitive areas.	to confirm dust control watering frequency and rates are adequate.
Migratory Birds	• Clearing of trees, shrubs, ground vegetation and structures has the potential to disturb or destroy nests of migratory birds. Migratory birds may nest within these areas, most of which are protected by the MBCA (1994). Potential effects include disturbance to nesting activity or possible loss of any nests present in the year of construction, depending on timing. Any migratory birds that are found nesting are protected under the MBCA.	• To reduce the possibility of contravention of the MBCA, vegetation removal should be scheduled to occur outside of the overall bird nesting season of April 1 to August 31. Some birds may nest before and after this peak bird nesting season due to annual seasonal fluctuations. If a nest of a migratory bird is found within the construction area outside of this nesting period it still receives protection. • If vegetation must be removed during the overall bird nesting season: • Nest and nesting activity searches will be	• Regular monitoring (frequency to be defined prior to pre-construction land clearing) will be undertaken to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
		conducted in areas defined as simple habitat8 by a qualified Biologist no more than 24 hours prior to vegetation removal. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (Cadman et. al., 2007). • If an active nest or confirmed nesting activity of a migratory bird is observed in simple habitat, regardless of the timing window recommended, a species-specific buffer area following ECCC guidelines will be applied to the nest or confirmed nesting activity wherein no vegetation removal will be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (ECCC, 2014), which will be confirmed by a qualified Biologist, but will protect a minimum of 10 m around the nest or nesting activity. • The results of all nest searches will be documented at the end of each survey day in a Technical Memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including co-ordinates, and, if required, the buffer applied to identified breeding/nesting sites. • If vegetation removal must occur in complex habitats within the above-listed timing windows and absolutely cannot be avoided,	

8. Simple habitats refer to habitats that contain few nesting spots or few species of migratory birds, where identification of active nests or confirmed nesting activity can be completed with confidence. According to ECCC (2014), examples of simple habitat include the following:
   - Urban parks consisting mostly of lawn with a few isolated trees;
   - Vacant lot with few possible nest sites;
   - Previously cleared area where there is a lag between clearing and construction activities (and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil); or
   - Structure such as a bridge, beacon, tower or building (often chosen as a nesting spot by robins, swallows, phoebes, nighthawks, gulls and others).

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
		the same best management practices (BMPs) such as nest and nesting activity searches described above will be undertaken. • Suitable human-made structures within the study area should be inspected for evidence of active bird nests during the breeding bird season prior to the onset of construction activities in order to determine appropriate nesting preventative measures (e.g., netting).	
Significant Wildlife Habitat	• No SWH has been identified within the study area. No direct or indirect effects to SWH are anticipated from the construction of the Project.	• Since no effects are anticipated, no mitigation measures specific to SWH are required for the construction of the Project.	• No monitoring activities are anticipated to be required at this time.
SAR	• Four SAR have moderate potential to occur within the study area. A presence/absence field survey confirmed that none of the four identified SAR are presently nesting in the study area. However, there is potential for these SAR to be encountered during construction and/or they may nest in the area between the finalization of this report and commencement of construction. Therefore, there is some risk of harm to these species. Potential effects to these species are as follows: • Peregrine Falcon -There is suitable foraging habitat throughout the study area, and very limited suitable nesting habitat on buildings within the Project area. • Common Nighthawk - The flat gravel-topped buildings within the study area that could provide suitable nesting habitat will not be affected by construction, and thus effects to this species are limited to incremental fragmentation of	To protect SAR, the following mitigation measures will be implemented: • In the event that a SAR, or potential SAR, is found within the construction area, work that could potentially harm the species will cease. • It is recommended that construction occur outside of the breeding season to ensure no effects to the breeding SAR birds, where possible, and where not possible that additional mitigation such as nest surveys be completed as described above. • If a nesting migratory bird (or SAR protected under the *ESA*) is identified within or adjacent to the construction site, the measures outlined above will be followed. • Suitable structures (e.g., bridges) within the study area should be searched prior to Project commencement to ensure no Barn Swallow nests exist. If nests are discovered, the Project must register the activity with the MNRF as part of ESA O. Reg. 242/08 prior to commencement of work. Installation of compensation habitat will likely be required, such as a nesting “kiosk”. Barn Swallows reuse nests from year to year, and their nests are protected year-round under the ESA.	• Regular on-site inspection by an Environmental Inspector, as outlined above. • Regular monitoring, to be defined prior to construction, will be undertaken to confirm that activities do not encroach into Barn Swallow nesting areas or disturb active Barn Swallow nesting sites.

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
	foraging habitat, and the minor risk of direct effects to individuals during construction. • Chimney Swift -There is limited suitable foraging habitat for this species, which is not protected under the ESA, and moderate potential for nesting habitat in nearby buildings. • Barn Swallow -There is moderate potential for the species to nest in the area, particularly beneath the rail bridge.	• Targeted roost surveys for Chimney Swift should be completed in appropriate chimneys if buildings (with chimneys) are proposed for removal within the study area prior to commencement of demolition activities. Repair, maintenance, or demolition of Chimney Swift roost/nesting structure may constitute destruction of critical habitat and the Project must register the activity with the MNRF as part of O. Reg. 242/08 under the ESA. • Implementation of vegetation clearing timing windows and standard awareness mitigation will mitigate against any potential effects to Peregrine Falcon and Common Nighthawk.	
Significant Natural Heritage Features	• No effects to the limited existing significant natural heritage features from the construction of the Project.	• Since no effects are anticipated, no mitigation measures are required for the construction of the Project.	• No monitoring activities are anticipated to be required at this time.
Operation			
Aquatic Environment	• Any use of chemical pesticides to clear vegetation to maintain the ROW also has the potential to affect hydrological features if not applied correctly. • Spills of fuel and/or application of other hazardous materials (e.g. de-icing substances during winter months) have the potential to affect surface water quality. • An increase in impervious surface area, which may result in increased stormwater runoff.	• Control all activity to prevent entry of any petroleum products, debris or other potential contaminants/deleterious substances, in addition to sediment as outlined above, to the watercourses. Conduct storage, refueling or maintenance of equipment at least 30 m away from the watercourse. An Emergency Preparedness and Response Plan will govern spill response. • Retain and protect as much of the natural vegetation as reasonably possible to help ensure bank stability and control erosion. • Efforts should be taken to prevent or limit temperature spikes through appropriate stormwater management practices and planting/maintaining shade-providing vegetation near impervious surfaces. • A Stormwater Management Report is being developed to support the Project and provide more details as to how to accommodate differences in flow volumes.	• No monitoring activities are anticipated to be required at this time.

Feature	Potential Effects	Mitigation Measures	Monitoring Activities

Terrestrial Environment	• The rail corridor is an existing operational rail corridor; operational maintenance is ongoing and not new. No potential effects resulting from the Project as they relate to the terrestrial environment are anticipated.
	• Spills of fuel and/or application of other hazardous materials (e.g. de-icing substances during winter months) have the potential to affect retained vegetation.
		• Carry out clearing, grubbing, site preparation and tree protection activities with consideration for relevant OPSS (e.g., OPSS 201 (Ministry of Transportation, 2011), OPSS 801.PROV (Ministry of Transportation, 2018)). When practicable, prune or top the vegetation instead of grubbing/uprooting, if required.
		• Any damaged trees will be pruned or removed through the implementation of proper arboricultural techniques, under supervision of an Arborist.
		• Mitigation measures specific to trees will be adhered to, including municipal by-law permitting requirements where applicable, that are summarized in the Project Tree Inventory Plan (Appendix C of this Volume), which will be further detailed in an Arborist Report, to be completed during detailed design.
		• Arborist Report will contain at a minimum the following information in addition to details of tree location, size, species, conditions and category:
		  • Recommendations for tree/vegetation protection and preservation measures for all trees/vegetation that are to be retained;
		  • Details of tree pruning;
		  • Details of all trees/vegetation recommended for removal, including removal measures;
		  • Mitigation and monitoring measures to ensure success of preservation and removal measures;
		  • Should vegetation compensation be required, it will be in accordance with the Metrolinx Vegetation Compensation Protocol; and
		  • Mapping.
			• No monitoring activities are anticipated to be required at this time.

Wildlife	• During operations, train traffic associated with the Project (e.g. stopping and starting) will result in noise, which may affect and possibly displace wildlife. The addition of the	• Wildlife present within the study area are likely somewhat adapted to these effects given the urban nature of the study area and the existing train traffic on the rail corridor. These effects are anticipated to be minor and wildlife fencing is not	• No monitoring activities are anticipated to be required at this time.

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
	station on the existing rail corridor is not anticipated to have an effect on overall habitat connectivity.	warranted given the existing level of habitat fragmentation in the study area.	
Migratory Birds	• The rail corridor is an existing operational rail corridor; operational maintenance is ongoing and not new. No potential effects resulting from the Project as they relate to migratory birds are anticipated.	• Since no new effects are anticipated, no mitigation measures specific to migratory birds are required for the operation of the Project.	• No monitoring activities are anticipated to be required at this time.
Significant Wildlife Habitat	• No SWH has been identified within the study area. No direct or indirect effects to SWH are anticipated from the operation of the Project.	• Since no effects are anticipated, no mitigation measures specific to SWH are required for the operation of the Project.	• No monitoring activities are anticipated to be required at this time.
SAR	• During operations, train traffic associated with the Project will result in noise (e.g., stopping and starting), which may affect and possibly displace SAR. Train traffic may also result in SAR mortality. SAR present within the study area are likely somewhat adapted to these effects given the urban nature of the site and existing active rail corridor. These effects are anticipated to be minor.	• Wildlife present within the study area are likely somewhat adapted to these effects given the urban nature of the study area and the existing train traffic on the rail corridor. These effects are anticipated to be minor and wildlife fencing is not warranted given the existing level of habitat fragmentation in the study area.	• No monitoring activities are anticipated to be required at this time.
Significant Natural Heritage Features	• No effects to significant natural heritage features are anticipated during operation of the Project.	• Since no new effects are anticipated, no mitigation measures specific to significant natural heritage features are required for the operation of the Project.	• No monitoring activities are anticipated to be required at this time.

4.3 Geology and Groundwater

4.3.1 Overview

No direct or indirect effects to underlying landforms and Iroquois Plain physiography, bedrock geology or groundwater are anticipated during construction or operations. However, hydrogeological and geo-environmental studies will be completed during detailed design to assess potential effects to groundwater during construction dewatering. It is possible that dewatering may result in temporary lowering of the groundwater table and groundwater flow direction. Effects to groundwater users and the natural environment, as a result of dewatering, will be assessed in the hydrogeological study.

4.3.2 Potential Effects, Mitigation and Monitoring

Potential effects, corresponding mitigation measures and monitoring activities relating to geology and groundwater are described in Table 4-2.

Table 4-2: Geology and Groundwater Environment - Potential Effects, Mitigation and Monitoring

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
Construction			
Landforms and Physiography	• No effects to the underlying landforms or Iroquois Plain physiographic region are anticipated from construction.	• Since no effects are anticipated, no mitigation measures for the underlying landforms or Iroquois Plain physiographic region are required for the construction of the Project.	• No monitoring activities are anticipated to be required at this time.
Soils and Bedrock Geology	• No direct or indirect effects to the bedrock geology are anticipated. Clearing of vegetation and excavation of soil associated with the construction of the Project may result in potential for direct and indirect effects to soils during and the construction phase, including: • Sedimentation and erosion of soils due to removal of vegetation, or changes in drainage patterns. • Soil contamination from chemical/fuel spills. • Mixing of topsoil and subsoil layers.	• Since no effects are anticipated, no mitigation measures for the bedrock geology are required for the construction of the Project. Potential effects from construction of the Project to soils can be managed through implementation of the following mitigation measures: • Soil conditions will be confirmed through future geotechnical investigations to be undertaken in support of detailed design • Retain existing vegetation within the study area to the extent practicable. Vegetation removal will be kept to a minimum, limited to within the construction disturbance area and should be scheduled to occur outside of the overall bird nesting season of April 1 to August 31, following the mitigation measures described for migratory birds. • Areas for vegetation removal will be refined during detailed design, if required (e.g., change in construction disturbance area, final staging areas). • Develop an Erosion and Sediment Control (ESC) Plan prior to construction for implementation throughout construction. The ESC Plan will include consideration of the Greater Golden Horseshoe Area Conservation Authorities' Erosion and Sediment Control Guideline for Urban Construction (Greater Golden Horseshoe Area Conservation Authorities, 2006) and OPSS 805 (Erosion and Sediment Control Measures) (Ministry of Transportation, 2015). This plan will encompass all areas of soils disturbance	• On-site inspection and maintenance by an Environmental Inspector will be undertaken on a regular basis (e.g., monthly) or as required (e.g., following storm events) over the course of construction to ensure the effectiveness of erosion and sediment control measures and other mitigation measures. • The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects. • Post-planting monitoring of restoration areas for one year after installation. One site visit will be conducted during the subsequent growing season to confirm survival of plantings and/or seed mix. Should the plantings and/or seed mix not survive, additional seeding and/or plantings will be undertaken one year thereafter with one additional monitoring visit in the following growing season. • Restoration/compensation monitoring will be confirmed through regulatory agency consultation during detailed design • Additional restoration/compensation measures and/or monitoring may be required based on the results of additional surveys and consultations with regulatory agencies.

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
		particularly in the vicinity of Lavender Creek. • Construction fencing and ESC fencing, where appropriate, will be installed and maintained to clearly define the construction disturbance area and prevent accidental damage to vegetation, or intrusion to adjacent vegetated areas. Fencing will be monitored and repaired as necessary throughout the construction period and will be removed and disposed of accordingly, post-construction. • Re-stabilize disturbed areas, incorporating re-vegetation using plantings and/or native seed mix appropriate to the site conditions. Exposed soils will be stabilized and re-vegetated as soon as possible to reduce erosion. • A Soil Management Plan will be developed by a Qualified Professional as defined in O. Reg. 153/04 for managing soil materials on-site (includes excavation, location of stockpiles, reuse and off-site disposal). • Soils needing to be stored temporarily will be stored in such a way as to not interfere with Project activities. • Topsoil and subsoil will not be mixed or contaminated with any other material. • The transportation, storage and handling of fuel shall be in accordance with the *Technical Standards and Safety Act*, 2000. • Machinery and equipment shall be inspected for leaks routinely throughout the duration of construction. • Vehicle maintenance and fuelling will be conducted at the designated and properly contained maintenance areas. • To mitigate accidental contamination from equipment leaks or spills, an Emergency Preparedness and Response Plan will govern spill response. • Restoration/compensation will be confirmed through regulatory agency consultation during	

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
		detailed design. • Additional restoration/compensation measures may be required based on the results of additional surveys and consultations with regulatory agencies. • During detailed design and prior to construction, a Stormwater Management Report will be completed to determine potential effects and mitigation measures. The report will be completed in consultation with TRCA and the MOECC. Stormwater management design will consider guidance provided by the MOECC Stormwater Management Planning and Design Manual (2003), MTO Drainage Management Manual (2008), TRCA Storm Water Management Criteria (2012), and the Low Impact Development Stormwater Management Planning and Design Guide (TRCA/Credit Valley Conservation, 2010). • The TRCA's Geotechnical Engineering Design and Submission Plan Guidelines will be referenced during the detailed design phase.	
Groundwater	• As hydrogeological and geo-environmental studies will be completed at the next stage of design, groundwater impacts (both direct and indirect) will be assessed in the hydrogeological study. Direct and indirect impacts to groundwater will be confirmed based on field investigations.	• • Mitigation measures will be determined by a hydrogeologist based on the findings from the hydrogeological and geo-environmental studies to be completed at the next stage of design once detailed evaluation of groundwater information is completed. • Hydrogeological and geo-environmental studies will be provided to TRCA for review. At this time, no effects are anticipated, as such no mitigation measures specific to groundwater are required for the construction of the Project However, this will be updated based on the findings from the hydrogeological and geo-environmental studies to be completed at the next stage of design. • Conduct staging, storage, refueling and maintenance of equipment at least 30 m away from the watercourse and outside of floodplain areas. • A Flood Contingency Plan will be developed during detailed design and prior to construction.	• No monitoring activities are required at this time. However, further field studies will be undertaken as part of the hydrogeological and geo-environmental studies and monitoring requirements will be determined at that time.

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
		• Identify the need for flood contingency measures where flood plain areas exist. • At this time, no effects are anticipated, as such no mitigation measures specific to groundwater are required for the construction of the Project. However, this will be updated based on the findings from the hydrogeological and geo-environmental studies to be completed at the next stage of design.	
Operation			
Landforms and Physiography	• No effects to the underlying landforms or Iroquois Plain physiographic region are anticipated from the operation of the Project.	• Since no effects are anticipated, no mitigation measures for the underlying landforms or Iroquois Plain physiographic region are required for the operation of the Project.	• No monitoring activities are anticipated to be required at this time.
Soils and Bedrock Geology	• No effects exceeding current operation effects to soils and bedrock geology are anticipated from the operation of the Project.	• Since no effects are anticipated, no mitigation measures for soils and bedrock geology are required for the operation of the Project.	• No monitoring activities are anticipated to be required at this time.
Groundwater	• No effects to groundwater are anticipated from the operation of the Project.	• Since no effects are anticipated, no mitigation measures specific to groundwater are required for the operation of the Project.	• No monitoring activities are anticipated to be required at this time.

4.4 Tree Inventory

4.4.1 Overview

Tree removals are required to accommodate the Project. An Arborist Report will be completed during detailed design to identify all trees that may be impacted by the Project, including trees to be preserved, removed or injured. Mitigation measures are necessary prior to and during Project implementation to reduce the potential effects to trees associated with the Project. Additionally, recommended monitoring activities help to confirm that mitigation measures are working effectively and provide feedback for adaptive management.

The specific trees identified in Table 4-3 for removal are also shown in Figure 3-2 to Figure 3-5.

4.4.2 Potential Effects, Mitigation and Monitoring Measures

Potential effects, corresponding mitigation measures and monitoring activities relating to trees are described in Table 4-3.

Further details on potential effects, mitigation and monitoring are provided in Appendix C of this Volume.

Table 4-3: Tree Inventory - Potential Effects, Mitigation and Monitoring

Effect Type	Potential Effects	Mitigation Measures	Monitoring Activity
Construction			

Tree Removal	Trees on Metrolinx property and/or lands immediately adjacent to accommodate the Project require removal.
	Approximate removals based on field investigations are as follows:
	• City of Toronto Categories 1 to 5 = **29 trees** [tree #'s: 24, 29-47, 62-64, and 66-71]
	• Metrolinx ROW = **212 trees** [tree #'s: 1-23, and 189 trees <10 cm DBH]
	• TRCA Regulated Area = **0 trees**
	• Trees less than 30 cm DBH on Private Property = 41 **trees** [tree #'s: 74, 75, 78, 79, TG80, 81 and TG82]
	• **Total = 282 trees**
		• Metrolinx is establishing a Vegetation Compensation Protocol for Metrolinx RER projects and vegetation that is removed will be compensated for in accordance with the provisions of this protocol:
		  • **For Municipal/Private Trees**: Metrolinx will work with each municipality to develop a municipality-wide streamlined tree permitting/compensation approach for municipal and private trees. The goal is to reduce the administrative permitting burden for trees along long stretches of rail corridor.
		  • **For Trees within Metrolinx Property**: Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing trees community types/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final compensation plan.
		  • **Conservation Authorities**: For vegetation removals within Conservation Authority lands where required, applicable removal and restoration requirements will be followed.
		  • **Federal Lands**: For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements will be followed.
		  • **Tree End Use**: Metrolinx will develop options for the end use of trees removed from Metrolinx property (e.g., reuse/recycling options).
		The opportunity to salvage existing vegetation, particularly sensitive species, for transplanting from within the Project boundaries will be explored.
		An Arborist Report will be prepared as the design progresses to detail proposed works, impacts and removals on private, conservation authority and/or municipal property. The Arborist Report will include:
		• The identification of all trees on private, conservation authority, and/or municipal property that will be
			• The success of compensation vegetation will be monitored in accordance with the Vegetation Compensation Protocol for Metrolinx RER Projects.
			• Post-planting monitoring of restoration areas will occur for one year after installation. One site visit will be conducted during the subsequent growing season to confirm survival of plantings and/or seed mix. Should the plantings and/or seed mix not survive, additional seeding and/or plantings will be undertaken one year thereafter with one additional monitoring visit in the following growing season.
			• Restoration/compensation monitoring will be confirmed through regulatory agency consultation during detailed design.
			• Additional restoration/compensation monitoring may be required based on the results of additional surveys and consultations with regulatory agencies.
			• On-site inspection will be undertaken as required during construction to ensure that only specified trees are removed, fencing is intact and there is no damage caused to the remaining trees and adjacent vegetation communities. Construction and/or silt fencing will be repaired if it is damaged. Any damaged trees will be pruned through the implementation of proper arboricultural techniques, under supervision of an Arborist or Forester.
			• Regular monitoring, to be defined prior to pre-construction land clearing, will be undertaken to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

Effect Type	Potential Effects	Mitigation Measures	Monitoring Activity
		impacted by the Project, including trees to be preserved, removed or injured. • Details of proposed work and impacts • Recommendations for protection and preservation measures for all trees/vegetation that are to be retained. • Details of tree pruning. • Details of all trees/vegetation recommended for removal, including removal measures. • Appraised values of trees/vegetation to be removed. • Mitigation and monitoring measures recommended to ensure success of preservation and removal measures. • Identification of suitable restoration/compensation to accommodate site-specific impacts, mitigation and replacement measures to offset vegetation losses. Where required, property specific landscaping and/or restoration plans for tree removals permitting and approvals.	
Tree Injury	Encroachment into the Tree Protection Zone of trees within the Study Area. No Trees are anticipated to be 'injured'. Impacts to trees adjacent to the work zone may result in unintended root damage or tree felling: 0 trees Protected trees that are close to the Project footprint, with a canopy that overhangs the work area, may require pruning of branches to facilitate works	An Arborist Report will be prepared as the design progresses to detail proposed works, impacts and removals on private, conservation authority and/or municipal property as discussed above. All removals should be felled into the work area to ensure that damage does not occur to the trees within the TPZ. Upon completion of the tree removals, all felled trees are to be removed from the site, and all brush chipped. All brush, roots and wood debris should be shredded into pieces that are smaller than 25 mm in size to ensure that any insect pests that could be present within the wood are destroyed.	On-site inspection will be undertaken as required during construction to ensure no unauthorized encroachment into vegetated areas and TPZs, as well as monitoring and administering repair of tree protection barriers to ensure proper installation and functionality.
Tree Preservation	Trees within the study area will require tree protection barriers. Tree to be preserved is # 28. Refer to Appendix C of this Volume for minimum TPZ distances.	Install barriers for trees to be preserved. Barriers to consist of following types: • Private Property: 2.4 m height plywood barriers (3/4" thick) • City Property: 1.2 m height orange plastic web snow fence on a 38x89 mm (2"x4") wood frame Barriers to be installed per details in Appendix C of this	Inspections to ensure barriers have been installed as specified and monitoring during construction to ensure barriers are functioning as specified and to administer any necessary repairs.

Effect Type	Potential Effects	Mitigation Measures	Monitoring Activity
		Volume. The following activities are prohibited within a TPZ: • Demolition, construction, replacement or alteration of permanent or temporary buildings, structures or pathways of any kind; • Installation of large stones or boulders; • Altering grade by adding or removing soil or fill, excavating, trenching, topsoil or fill scraping, compacting soil or fill, dumping or disturbance of any kind; • Storage of construction materials, equipment, wood, branches, leaves, soil or fill, construction waste or debris of any sort; • Application, discharge or disposal of any substance or chemical that may adversely affect the health of a tree; • Causing or allowing water or discharge, to flow over slopes or through natural areas; • Access, parking or movement of vehicles, equipment or pedestrians; • Cutting, breaking, tearing, crushing, exposing or stripping tree's roots, trunk and branches; • Nailing or stapling into a tree, including attachment of fences, electrical wires or signs; • Stringing of cables or installing lights on trees; • Soil remediation, removal of contaminated fill; • Excavating for directional or micro-tunnelling and boring entering shafts. • Tree protection barriers shall be clearly staked in the field prior to construction to ensure correct positioning of fencing and avoid unnecessary disturbance. • To avoid root zone impacts on trees to be retained, excavated material shall not be stored against the tree protection barrier.	
Nests of Migratory Birds	Clearing of trees has the potential to disturb or destroy migratory birds or the nests of migratory birds.	• To reduce the possibility of contravention of the MBCA, vegetation removal should be scheduled to occur outside of the overall bird nesting season of April 1 to August 31. Some birds may nest before and after this peak bird nesting season due to annual seasonal fluctuations. If a nest of a migratory bird is found within the construction area outside of this nesting period it still receives	Regular monitoring, to be defined prior to pre-construction land clearing, will be undertaken to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

Effect Type	Potential Effects	Mitigation Measures	Monitoring Activity

		protection.
		• If vegetation must be removed during the overall bird nesting season:
		  • Nest and nesting activity searches will be conducted in areas defined as simple habitat[9] (i.e., the CUM1-1 community) by a qualified Biologist no more than 24 hours prior to vegetation removal. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (OBBA, 2001).
		• If an active nest or confirmed nesting activity of a migratory bird is observed in simple habitat, regardless of the timing window recommended, a species-specific buffer area following ECCC guidelines will be applied to the nest or confirmed nesting activity wherein no vegetation removal will be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (ECCC, 2014), which will be confirmed by a qualified Biologist, but will protect a minimum of 10 m around the nest or nesting activity.
		  • The results of all nest searches will be documented at the end of each survey day in a Technical Memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including co-ordinates, and, if required, the buffer applied to identified breeding/nesting sites.
		• If vegetation removal must occur in complex habitats within the above-listed timing windows and absolutely cannot be avoided, the same best management practices (BMPs) such as nest and nesting activity searches	

9. Simple habitats refer to habitats that contain few nesting spots or few species of migratory birds, where identification of active nests or confirmed nesting activity can be completed with confidence. According to ECCC (2014), examples of simple habitat include the following:
   - Urban parks consisting mostly of lawn with a few isolated trees;
   - Vacant lot with few possible nest sites;
   - Previously cleared area where there is a lag between clearing and construction activities (and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil); or
   - Structure such as a bridge, beacon, tower or building (often chosen as a nesting spot by robins, swallows, phoebes, nighthawks, gulls and others).

Effect Type	Potential Effects	Mitigation Measures	Monitoring Activity
		described above will be undertaken.	
Operations			
Tree Injury	Deterioration in tree vitality or a decline in tree vigour of trees that within the study area adjacent to the Project that could occur over time due to new growing conditions (e.g. sunscald, compaction, root damage, broken branches and TPZ damage).	Maintenance and seasonal pruning or tree removal to prevent woody material from falling onto the rail corridor, by a Certified Arborist or under the supervision of one.	Routine inspections to identify dead trees or limbs adjacent to the Project that require removal or maintenance for safety. Certified Arborist to inspect and assess trees on adjacent lands annually (at a minimum) from the Metrolinx property.

Nests of Migratory Birds	Clearing of trees has the potential to disturb or destroy nests of migratory birds.	• To reduce the possibility of contravention of the MBCA, vegetation removal should be scheduled to occur outside of the overall bird nesting season of April 1 to August 31. Some birds may nest before and after this peak bird nesting season due to annual seasonal fluctuations. If a nest of a migratory bird is found within the construction area outside of this nesting period it still receives protection.
		• If vegetation must be removed during the overall bird nesting season:
		  • Nest and nesting activity searches will be conducted in areas defined as simple habitat[10] (i.e., the CUM1-1 community) by a qualified Biologist no more than 24 hours prior to vegetation removal. Nesting activity will be documented when it consists of confirmed breeding evidence (ECCC, 2014).
		  • If an active nest or confirmed nesting activity of a migratory bird is observed in simple habitat, regardless of the timing window recommended, a species-specific buffer area following Environment Canada guidelines will be applied to the nest or confirmed nesting activity wherein no vegetation
			Regular monitoring (frequency to be defined prior to vegetation removal) will be undertaken to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

10. Simple habitats refer to habitats that contain few nesting spots or few species of migratory birds, where identification of active nests or confirmed nesting activity can be completed with confidence. According to ECCC (2014), examples of simple habitat include the following:
    - Urban parks consisting mostly of lawn with a few isolated trees;
    - Vacant lot with few possible nest sites;
    - Previously cleared area where there is a lag between clearing and construction activities (and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil); or
    - Structure such as a bridge, beacon, tower or building (often chosen as a nesting spot by robins, swallows, phoebes, nighthawks, gulls and others).

Effect Type	Potential Effects	Mitigation Measures	Monitoring Activity
		removal will be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (ECCC, 2014), which will be confirmed by a qualified Biologist, but will protect a minimum of 10 m around the nest or nesting activity. • The results of all nest searches will be documented at the end of each survey day in a Technical Memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including co-ordinates, and, if required, the buffer applied to identified breeding/nesting sites. • If vegetation removal must occur in complex habitats within the above-listed timing windows and absolutely cannot be avoided, the same Best Management Practices (BMPs) such as nest and nesting activity searches described above will be undertaken.	

4.5 Cultural Environment

4.5.1 Overview

Nine properties in the study area have been identified to hold known or potential CHVI. The St. Clair Avenue West Subway is anticipated to be directly impacted by the Project. Specifically, alterations to the subway are anticipated to be required to accommodate platforms and other station infrastructure. This property has undergone a CHER as part of the TPAP and has been identified as a PHP, as discussed in Section 4.5.2. A Heritage Impact Assessment HIA will be undertaken for this property during detailed design. Eight indirectly affected properties have been identified as having potential CHVI.

Additional properties that were identified as having potential CHVI are summarized in Table 4-5.

In July 2018 a CHAR was prepared to build on the findings of the CHSR and to identify potential adverse impacts to identified cultural heritage resources and to recommend mitigation measures to lessen or avoid any identified impacts. The results of this CHAR are provided in Table 4-5.

Table 4-4: Table of Anticipated Impacts and Screening Recommendations

Cultural Heritage Resource #	Municipal Address	Heritage Recognition	Directly Affected Property/Adjacent Indirectly Affected Property	Analysis of Potential/Anticipated Impact	Next Steps
SW-1	St. Clair Avenue West Subway	Provincial Heritage Property	Directly Affected Property - anticipated alteration for widening of the bridge deck in an east-west direction.	• Impacts to be assessed through HIA during detailed design.	HIA required.
SW-2	Heydon House (1834 St. Clair Ave West)	Designated under Part IV of the OHA, By-law 599-83.	Indirectly Affected Property - no direct impacts anticipated at this time. This property may experience indirect impacts as a result of construction activities.	• Not within Vibration ZOI (structure is >150 m from Project footprint). • No indirect adverse impacts identified.	No further work required.
SW-3	1900 St. Clair Avenue West	None. Potential CHVI (identified during screening).	Indirectly Affected Property - no direct impacts anticipated at this time. This property may experience indirect impacts as a result of construction activities.	• Within Vibration ZOI (structure is immediately adjacent to Project footprint).	No further studies recommended. Mitigation measures for potential indirect impacts are outlined in Section 4.5.2.
SW-4	1866 St. Clair Avenue West	None. Potential CHVI (identified during screening).	Indirectly Affected Property - no direct impacts anticipated at this time. This property may experience indirect impacts as a result of construction activities.	• Not within Vibration ZOI (structure is >85m from Project footprint). • No indirect adverse impacts identified.	No further work required.
SW-5	1862 St. Clair Avenue West	None. Potential CHVI (identified during screening).	Indirectly Affected Property - no direct impacts anticipated at this time. This property may experience indirect impacts as a result of construction activities.	• Not within Vibration ZOI (structure is >100 m from Project footprint). • No indirect adverse impacts identified.	No further work required.
SW-6	1860 St. Clair Avenue West	None. Potential CHVI (identified during screening).	Indirectly Affected Property - no direct impacts anticipated at this time. This property may experience indirect impacts as a result of construction activities.	• Not within Vibration ZOI (structure is >115 m from Project footprint). • No indirect adverse impacts identified.	No further work required.
SW-7	1850 St. Clair Avenue West	None. Potential CHVI	Indirectly Affected Property - no direct impacts anticipated at this time. This property may experience	• Not within Vibration ZOI (structure is >130 m from Project footprint). • No indirect adverse impacts identified.	No further work required.

Cultural Heritage Resource #	Municipal Address	Heritage Recognition	Directly Affected Property/Adjacent Indirectly Affected Property	Analysis of Potential/Anticipated Impact	Next Steps
		(identified during screening).	indirect impacts as a result of construction activities.		
SW-8	Hydro Corridor	None. Potential CHVI (identified during screening).	Indirectly Affected Property - no direct impacts anticipated at this time. This property may experience indirect impacts as a result of construction activities.	• Not within Vibration ZOI (>8 m from Project footprint). • No indirect adverse impacts identified.	No further work required.
SW-9	ABC Lumber (17T 623326.60 E, 4837043.19 N)	None. Potential CHVI (identified during screening).	Directly Affected Property - Project footprint extends into property.	• Not within Vibration ZOI (structure is >20 m from Project footprint). • A portion of the property will be acquired. The loss of this small portion of the property will not result in any adverse impacts to the CHVI or heritage attributes of the property.	A CHER is required during detailed design (an HIA may be required pending results of the CHER).

4.5.2 Cultural Heritage Evaluation

One CHER was completed as part of this TPAP, for the St. Clair Avenue West Subway property, in accordance with the MTCS *Standards and Guidelines for Conservation of Provincial Heritage Properties* (2010) and the *OHA* The CHER was also undertaken according to the guidelines presented in the Metrolinx *Interim Cultural Heritage Management Process* (Interim Heritage Process, 2013), *Draft Terms of Reference for Consultants: Cultural Heritage Evaluation Report and Cultural Heritage Evaluation Recommendations Report* (2016).

4.5.2.1 St. Clair Avenue West Subway

The property encompasses the St. Clair Avenue West Subway located within part of Lot 35, Concessions 2 and 3, in the historic York Township, former County of York, now the City of Toronto, in the Province of Ontario.

The recommended outcome of the Cultural Heritage Evaluation of the St. Clair Avenue West Subway in the City of Toronto is that it meets the criteria set out under O. Reg 9/06 of the *OHA* but does not meet the criteria set out under O. Reg. 10/06 of the *OHA.*

4.5.3 Archaeology

Archaeological recommendations are based on a Stage 1 AA undertaken for this Project. The Stage 1 AA found that the location of the study area in close proximity to primary water sources (Lavender Creek is within the study area, and Black Creek is within 1 km) and historic transportation routes (St. Clair Avenue West, Weston Road, Old Weston Road and the rail corridor) indicates that the property holds potential for the recovery of both pre-contact and contact period archaeological resources. While the development of the surrounding lands resulted in disturbances of lands within the study area, a Stage 2 AA is required to determine the extent of that disturbance in these areas as well as in the areas that have been found to be undisturbed. The rail corridor and surrounding lands have been identified as disturbed and no further archaeological assessment will be required.

Figure 3-7 shows areas of archaeological potential requiring Stage 2 AA.

A Stage 2 AA is required on all lands that have been found to be undisturbed (Figure 3-7). During the Stage 2 AA, all lands documented as undisturbed must be subjected to a Stage 2 test pit survey at 5 m intervals per Section 2.3.2 of the 2011 S&G. Lands that have been identified to hold deeply buried potential, such as areas that have been identified to have contained historical structures and have not undergone deep disturbance must be subjected to a Stage 2 AA as per Section 2.1.7 Standard 3 of the 2011 S&G. Using backhoes, trenches should be excavated at a maximum 10 m intervals to obtain clear sedimentary profiles to assess deeply buried potential. Trench placement should be determined to be an effective response to the detailed design of the Project. Lands with deeply buried archaeological potential without key defining historical elements to focus deeply buried excavation strategies must be subjected to a Stage 2 AA construction monitoring as per Section 2.1.7 Standard 4 of the 2011 S&G (Figure 3-7).

4.5.4 Potential Effects, Mitigation and Monitoring Measures

Potential effects, corresponding mitigation measures and monitoring activities relating to the cultural environment are described in Table 4-4.

Further details on potential effects, mitigation and monitoring are provided in Appendices E and F of this Volume of the EPR.

Table 4-4: Cultural Environment - Potential Effects, Mitigation and Monitoring

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
Construction			
Built and Cultural Heritage	• Directly Affected Property - anticipated alteration to accommodate new platforms.	• An HIA will be completed during detailed design for the following directly affected property: • SW-1 - St. Clair Avenue West Subway. • The HIA will identify mitigation measures to avoid or reduce potential effects on heritage attributes. These mitigation measures will be implemented.	• The HIA may identify monitoring recommendations. • These monitoring recommendations will be implemented.
	• Directly Affected Property - the Project footprint will extend into a portion of the property removed from the potential heritage attributes.	• A CHER and, if required, HIA will be prepared during Detailed Design, to assess additional impacts related to the design of the station, for the following property within which the Project footprint is located: • SW-9 - ABC Lumber (153 Weston Road). • These studies will be conducted.	• If required to be undertaken, an HIA may identify monitoring activities. • These monitoring recommendations will be implemented.
	• Indirectly Affected Properties - no direct impacts anticipated at this time. This property may experience indirect impacts as a result of construction activities.	• Potential construction vibration impacts were identified for the following property: • SW-3 - 1900 St. Clair Avenue West. Mitigation measures to avoid or reduce potential effects on heritage attributes to reduce or avoid construction vibration impacts have been identified as follows: • Pre-construction consultations between the applicant and owners/occupants; • Pre-construction measurements of background vibration levels; • Pre-condition survey by means of a photographic record of potentially affected structure façades and all surfaces, including visible sections of building foundations, building cladding, doors, windows, interior wall finishes, surface pavement, sidewalks, signs and trees. Each of the elements should be rated on their general condition (new, good, fair, poor, severe), and visible defects will be photographed. • Any additional measures outlined in the Noise and Vibration Control Plan should be implemented for the properties of known and potential CHVI that fall within the ZOI. These mitigation measures will be implemented.	• Work that may exceed the vibration limits outlined in the City of Toronto By-law No. 514-2008 or that may cause structural damage should be monitored.
	• No potential direct or indirect impacts have been identified	• Not applicable (N/A).	• N/A

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
	for the following properties located outside of the vibration ZOI: • SW-2 - Heydon House (1834 St. Clair Ave West) • SW-4 - 1866 St. Clair Avenue West • SW-5 - 1862 St. Clair Avenue West • SW-6 - 1860 St. Clair Avenue West • SW-7 - 1850 St. Clair Avenue West • SW-8 - Hydro Corridor		
Archaeology	• Potential for the recovery of both pre-contact and contact period archaeological resources.	• Areas determined to be undisturbed will be subjected to a Stage 2 AA Test Pit Survey at 5-meter intervals in accordance with Section 2.1.2 of the 2011 S&G prior to construction activities to ensure no cultural heritage resources will be impacted; • Areas determined to be disturbed do not require further assessment; • Areas identified to contain deeply buried archaeological potential must be subjected to a Stage 2 AA in accordance with Section 2.1.7, Standard 3 of the 2011 S&G, prior to construction activities. Trenches should be excavated at a maximum 10 m intervals to obtain clear sedimentary profiles to assess deeply buried potential. Trench placement should be determined to be an effective response to the detailed design of the Project (Figure 3-7); • Areas identified to contain deeply buried archaeological potential without key defining historical elements (i.e. structures) must be subjected to Stage 2 AA construction monitoring in accordance with Section 2.1.7 Standard 4 (Figure 3-7); and • If final limits of the St. Clair-Old Weston Project are altered and fall outside the current study area, an additional Stage 1 AA is required to assess the new footprint; and • If human remains are encountered during project work, all activities must cease immediately and the local police as well	• Further AA may identify the need for monitoring during construction.

Feature	Potential Effects	Mitigation Measures	Monitoring Activities
		as the Cemeteries Regulation Unit of the Ministry of Government and Consumer Services must be contacted. In situations where human remains are associated with archaeological resources, MTCS should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the OHA.	
Operation and Maintenance			
Built and Cultural Heritage	• N/A	• N/A	• N/A
Archaeology	• N/A	• N/A	• N/A

4.6 Socio-Economic and Land Use Characteristics

4.6.1 Overview

The Project has the potential to result in temporary and permanent socio-economic and land use effects, including construction-related nuisance effects (e.g., increased noise, vibration, and dust), and visual and aesthetic effects. It is anticipated that potential effects can be mitigated through thoughtful Project design, coupled with effective implementation of mitigation measures.

The Project will bring benefits to existing communities along the Kitchener rail corridor by providing improved access to the GO rail network. The Project will bring increased pedestrian and cyclist access to the Project and to the community surrounding the Project by incorporating new cycling and pedestrian paths into its design, including a sidewalk connection to the future extension of Gunns Road, as well as the connection to the future pathway connection to the S.A.D.R.A Park Trail. The Project is also expected to create public benefit by improving public transportation options. The social and economic benefit of public transit is expected to outweigh any negative residual effects. The Project is anticipated to reduce traffic congestion and promote economic spin offs and redevelopment near the Project. The Project will also provide greater mobility for those without access to, or ability to drive, a car, and better connectivity for active transportation users. The new station will also support the City of Toronto's direction to accommodate future growth in a sustainable manner while also providing infrastructure to promote active transportation (City of Toronto, 2015a).

4.6.2 Potential Effects, Mitigation and Monitoring Measures

Potential effects, corresponding mitigation measures and monitoring activities relating to the socio-economic and land use environment are described in Table 4-5.

Further details on potential effects, mitigation and monitoring are provided in Appendix F of this Volume.

Table 4-5: Socio-Economic and Land Use Environment - Potential Effects, Mitigation and Monitoring

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
Neighbourhood Characteristics			
Demographics	**During Operations:** Additional employment opportunities and additional revenue opportunities for local businesses.	**During Operations:** None anticipated at this time.	**During Operations:** None anticipated at this time.
Physical Neighbourhood Composition	**During Construction:** Construction may result in the need for temporary road or lane closures causing access restrictions to nearby residences or businesses. Additional details are provided in the Transportation Brief in Appendix I of this Volume. The final design of the Project may introduce opportunities for inconsistent design elements such as reducing visibility and creating spaces without character. Enhanced transit service to the nearby residential neighbourhoods may attract development interest and investment in the community. Enhanced transit service to nearby residential neighbourhoods may also provide further opportunities to engage in active transportation modes.	**During Construction:** Access to residential and commercial areas will be maintained at all times. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as any future modifications to these schedules as they occur. At a minimum, safety fencing will be used where necessary to separate work areas from pedestrians and/or cyclists. Metrolinx is establishing a Vegetation Compensation Protocol for RER projects. Vegetation that is removed will be compensated for in accordance with this Protocol as documented in the Tree Inventory Plan in Appendix C of this Volume.	**During Construction:** On-site inspection and maintenance by an Environmental Inspector will be undertaken on a regular basis (e.g., monthly) or as required (e.g., following storm events) over the course of construction to ensure the effectiveness of ESC and other mitigation measures.
	During Operations: Enhanced transit service to the nearby residential neighbourhoods may attract development interest and investment in the community.	**During Operations:** CPTED principles will be used to ensure areas with reduced visibility as a result of the construction of the station will be minimized.	**During Operations:** None anticipated at this time.
Community Groups and Resources	**During Construction:** No direct physical effects to community groups or resources are anticipated during the construction of the Project.	**During Construction:** A Noise and Vibration Control Plan will be developed prior to construction. The plan will include a complaint response protocol and will indicate that surrounding property owners and tenants will be informed of anticipated upcoming construction works, including any work at night. Mitigation is documented in the Noise and	**During Construction:** Regular inspections of dust emissions (frequency to be defined prior to project construction) will be undertaken to confirm dust control watering frequency and rates are adequate. Site supervisors should monitor the site

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
		Vibration Study in Appendix H of this volume. An Air Quality Management Plan will be developed for implementation during construction to address construction equipment and vehicle exhaust, potential traffic disruption and congestion, fugitive dust and odour. Mitigation is documented in the Air Quality Study in Appendix G of this Volume.	for wind direction and weather conditions to ensure that high-impact activities be reduced when the wind is blowing consistently towards nearby sensitive receptors. The site supervisor should also monitor for visible fugitive dust and take action to determine the root-cause in order to counteract this. Specific details regarding monitoring should be included in the Air Quality Management Plan.
	During Operations: Enhanced transit service to the community will provide local community groups with additional travel options to the area, providing further opportunities to participate in group events and activities.	**During Operations:** None anticipated at this time.	**During Operations:** None anticipated at this time.
Institutional Uses and Places of Worship	**During Construction:** Nearby institutional uses or places of worship may experience nuisance effects resulting from noise and vibration and emissions due to construction equipment and other construction related activities. Construction may result in the need for temporary road or lane closures causing access restrictions to nearby local institutional uses. Additional details are provided in the Transportation Brief in Appendix I of this Volume.	**During Construction:** A Noise and Vibration Control Plan will be developed prior to construction. The plan will include a complaint response protocol and will indicate that surrounding property owners and tenants will be informed of anticipated upcoming construction works, including any work at night. Mitigation is documented in the Noise and Vibration Study in Appendix H of this Volume. An Air Quality Management Plan will be developed for implementation during construction to address construction equipment and vehicle exhaust, potential traffic disruption and congestion, fugitive dust and odour. Mitigation is documented in the Air Quality Study in Appendix G of this Volume. Access to institutional uses or places of worship will be maintained at all times. Potentially affected individuals will be notified of initial construction schedules, as well as any future modifications to these schedules as they occur.	**During Construction:** Regular inspections of dust emissions (frequency to be defined prior to project construction) will be undertaken to confirm dust control watering frequency and rates are adequate. Site supervisors should monitor the site for wind direction and weather conditions to ensure that high-impact activities be reduced when the wind is blowing consistently towards nearby sensitive receptors. The site supervisor should also monitor for visible fugitive dust and take action to determine the root-cause in order to counteract this. Specific details regarding monitoring should be included in the Air Quality Management Plan.
	During Operations: Enhanced transit service to the nearby institutional uses or places of worship may	**During Operations:** Operations will be carried out in accordance with applicable regulations and standards, including	**During Operations:** Regular inspections of dust emissions (frequency to be defined prior to project

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
	benefit users of these resources. Nearby institutional uses or places of worship may experience nuisance effects resulting from noise and vibration and emissions due to regular operations and maintenance.	the MOEE/GO Transit Noise and Vibration Protocol (Ministry of Environment and Energy, 1994) and the Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning Publication NPC 300 (Ministry of the Environment and Climate Change, 2013). Mitigation is documented in the Noise and Vibration Study in Appendix H of this Volume, and the Air Quality Study in Appendix G of this Volume.	construction) will be undertaken to confirm dust control watering frequency and rates are adequate. Site supervisors should monitor the site for wind direction and weather conditions to ensure that high-impact activities be reduced when the wind is blowing consistently towards nearby sensitive receptors. The site supervisor should also monitor for visible fugitive dust and take action to determine the root-cause in order to counteract this. Specific details regarding monitoring should be included in the Air Quality Management Plan.
Recreational Uses Parks and Open Spaces	**During Construction:** There may be temporary disruptions to the public access and enjoyment of Upper Junction Park and S.A.D.R.A. Park during construction. Tree removal may affect the overall recreational and aesthetic experience of existing and future park users.	**During Construction:** Potential effects to users seeking to access nearby recreational areas and the trail during construction will be mitigated through the installation of appropriate way-finding, regulatory, and warning signs, as per the Construction Traffic Control and Management Plan. Special directional signage may be considered as a means to help pedestrians and cyclists avoid any potential construction activities. At a minimum, safety fencing will be used where necessary to separate work areas from pedestrians and/or cyclists. All stockpiled materials will be fenced and the construction footprint area will be minimized to prevent the construction zone from extending beyond that which is necessary. Metrolinx is establishing a Vegetation Compensation Protocol for RER projects. Vegetation that is removed will be compensated for in accordance with this Protocol as documented in the Tree Inventory Plan in Appendix C of this Volume.	**During Construction:** Regular inspections of dust emissions (frequency to be defined prior to project construction) will be undertaken to confirm dust control watering frequency and rates are adequate. Site supervisors should monitor the site for wind direction and weather conditions to ensure that high-impact activities be reduced when the wind is blowing consistently towards nearby sensitive receptors. The site supervisor should also monitor for visible fugitive dust and take action to determine the root-cause in order to counteract this. Specific details regarding monitoring should be included in the Air Quality Management Plan.
	During Operations: The project will result in increased connectivity across the railway corridor, and	**During Operations:** None anticipated at this time.	**During Operations:** None anticipated at this time.

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
	improve connections to adjacent recreational uses and open spaces, such as the Junction Park and S.A.D.R.A. Park.		
Sensitive Land Uses	**During Construction:** Nearby sensitive land uses may experience nuisance effects resulting from noise and vibration and emissions due to construction equipment and other construction related activities.	**During Construction:** A Noise and Vibration Control Plan will be developed prior to construction. The plan will include a complaint response protocol and will indicate that surrounding property owners and tenants will be informed of anticipated upcoming construction works, including any work at night. Mitigation is documented in the Noise and Vibration Study Appendix H of this Volume. An Air Quality Management Plan will be developed for implementation during construction to address construction equipment and vehicle exhaust, potential traffic disruption and congestion, fugitive dust and odour. Mitigation is documented in the Air Quality Study in Appendix G of this Volume.	**During Construction:** Site supervisors should monitor the site for wind direction and weather conditions to ensure that high-impact activities be reduced when the wind is blowing consistently towards nearby sensitive receptors. If a structure falls within the ZOI, the following will be required: • Pre-construction consultations between the applicant and owners/occupants; • Pre-construction measurements of background vibration levels; • Pre-condition survey by means of a photographic record of potentially affected structure façades and all surfaces, including visible sections of building foundations, building cladding, doors, windows, interior wall finishes, surface pavement, sidewalks, signs and trees. Each of the elements should be rated on their general condition (new, good, fair, poor, severe), and visible defects will be photographed; and • A vibration monitoring program to confirm that the Prohibited Construction Vibrations are not exceeded.
	During Operations: Nearby sensitive land uses may experience nuisance effects resulting from noise and vibration and emissions due to regular operations and maintenance.	**During Operations:** Operations will be carried out in accordance with applicable regulations and standards, including the MOEE/GO Transit Noise and Vibration Protocol (MOEE/GO Transit, 1995) and the Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning Publication NPC 300 (MOECC, 2013). Mitigation requirements are documented in the Noise and Vibration Study in Appendix H of this Volume,	**During Operations:** None anticipated at this time.

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
		and the Air Quality Study in Appendix G of this Volume.	
Transit and Transportation Network			
Public Transit	**During Construction:** Potential temporary disruptions to the existing service along the rail corridor during construction. Construction may result in the need for temporary road or lane closures causing access restrictions to local TTC streetcar and bus routes.	**During Construction:** Notification will be provided in advance of any potential service disruptions. Site-Specific Construction Traffic Control and Management Plans will be prepared and implemented prior to Project construction to maintain reasonable access through work zones, to the extent possible. Metrolinx and the City of Toronto will consult with the TTC to establish a suitable mitigation strategy to be implemented.	**During Construction:** Metrolinx will consult directly with the TTC to establish a suitable monitoring strategy to be implemented. Traffic impacts to be monitored in accordance with the Construction Traffic Control and Management Plan
	During Operations: Provision of new transit service to nearby residents and workers, as well as improved GO Transit and TTC connectivity. The Project is expected to create significant public benefit by providing local access to the regional rail network.	**During Operations:** None anticipated at this time.	**During Operations:** None anticipated at this time.
Cycling Infrastructure Network	**During Construction:** Cyclist movement within the study area may experience temporary effects as a result of the construction activities of the Project.	**During Construction:** Potential effects to pedestrian and cycling activities during construction will be mitigated through the installation of appropriate way-finding, regulatory, and warning signs.	**During Construction:** Metrolinx will consult with the City of Toronto to establish a suitable mitigation strategy to be implemented. Cycling network impacts to be monitored in accordance with the Construction Traffic Control and Management Plan.
	During Operations: The project will result in increased connectivity to the overall cycling network with a sidewalk connection to the future extension of Gunns Road, as well as the connection to the future pathway connection to the S.A.D.R.A Park Trail. Overall multi-modal connectivity to the wider public transit network will be enhanced and will subsequently encourage cycling culture	**During Operations:** None anticipated at this time.	**During Operations:** None anticipated at this time.

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
	and demand in the local neighbourhood.		
Movement	**During Construction:** Construction of the Project may result in the need for temporary road or lane closures causing access restrictions to nearby properties. Pedestrian and cyclist movement within the study area may experience temporary effects during construction of the Project, as detailed in the Transportation Brief in Appendix I of this volume. There are potential conflicts between pedestrians, cyclists, and motorists, and ingress/egress bus traffic associated with the operation of the station. Potential hazards include: trucks, heavy equipment, and machinery in operation on the site.	**During Construction:** Access to residences, businesses, and industrial areas will be maintained at all times. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur. Adequate construction hauling routes will be determined during detailed design. Site-specific Construction Traffic Control and Management Plans will be prepared and implemented prior to Project construction to maintain reasonable access through work zones, to the extent possible, and include construction signage and safety fencing requirements. Potential effects to pedestrian and cycling activities during construction will be mitigated through the installation of appropriate way-finding, regulatory, and warning signs. It is recommended that the temporary construction staging be implemented according to Ontario Traffic Manual (OTM) Book 7 on Temporary Conditions. Minimize disruption to the existing trails in the study area to the extent feasible while balancing construction schedules and expediting construction activity Mitigation requirements are documented in the Transportation Brief in Appendix I of this Volume.	**During Construction:** Metrolinx will consult with the City of Toronto and the TTC to establish a suitable mitigation strategy to be implemented. Traffic impacts to be monitored in accordance with the Traffic Control and Management Plan.
	During Operations: Potential long term increase in pedestrian and vehicular traffic as a result of the Project will affect these neighbourhoods, as detailed in the Transportation Brief in Appendix I of this Volume. MUPs associated with the Project will facilitate pedestrian and cyclist movement in the study area.	**During Operations:** No effects to roads and traffic volumes, public transit, or pedestrian or cycling routes are anticipated during the operational phases of the Project. Traffic signals should be optimized post-construction to accommodate predicted changes in traffic patterns. Mitigation requirements are documented in the	**During Operations:** None anticipated at this time.

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
	The Project will bring increased pedestrian and cyclist access to the Station and to the community surrounding the Station by incorporating new sidewalks and cycling lanes into its design.	Transportation Brief in Appendix I of this Volume.	
Utilities			
Utilities	**During Construction:** Utility relocation and/or service interruptions to nearby properties may be required. Protection of utility infrastructure may also be necessary. These effects could be either temporary or permanent. The following potential utility conflicts were identified in the Project footprint at the time of report preparation: • Toronto Hydro • Hydro One • Enbridge Gas Distribution • Bell Canada • Rogers Communications • Group Telecom • CN Signals • Toronto Water • City of Toronto sanitary, storm and wastewater Potential temporary disruptions to CP Rail operations along the rail corridor during construction.	**During Construction:** Effects to utilities during construction will be confirmed during detailed design. Additional Subsurface Utility Engineering (SUE) investigations may be conducted during detailed design, as required, to confirm existing utilities. A review of existing and proposed future utilities plans, in addition to on-going consultation with utility companies and the City of Toronto, should be conducted during the detailed design stage. Any relocations, service interruptions, or utility protection projects should be identified as early as possible to allow for project coordination and construction management plans to be created with consideration of utility needs. Utility relocations will be coordinated to minimize the overall impacts on existing natural heritage systems. Metrolinx will work with Hydro One during detailed design to avoid impacts and/or develop mitigation. Metrolinx will continue to work with CP through detailed design to minimize potential effects on CP operations.	**During Construction:** None anticipated at this time.
	During Operations: Access to utilities may require temporary access permission (easements) for maintenance activities.	**During Operations:** Any utility conflicts will have been identified and resolved during the construction stage of the Project. Subsequently, no further mitigation strategies related to utilities are anticipated to be	**During Operations:** None anticipated at this time.

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
		required during the operational stage. Potential access requirements as a result of maintenance activities to be determined in consultation with the relevant utility owners during detailed design.	
Property			
Property	**During Construction:** Property is anticipated to be required to facilitate Project construction and operation. Refinement of property requirements including laydown and staging areas will occur through detailed design. The acquisition of non-Metrolinx owned property is required to implement the Project, as defined in the IPD (see Appendix A). Property requirements are anticipated to comprise of the following: • Full property takings - none. • Partial property takings: ◆ Private - 1.44 ha. • Temporary full property takings - none. • Temporary partial property takings: ◆ Private - 0.80 ha. ◆ Public - 0.80 ha. • Other real estate considerations: ◆ Private - 1.07 ha. Other real estate considerations are anticipated to include lands for bike trails, station adjacent infrastructure, and other City initiatives. Temporary access may be required to adjacent properties for maintenance activities.	**During Construction:** Specific property requirements will be determined during detailed design. Ongoing consultation with affected property owners will help identify appropriate site-specific mitigation measures. Access to residences, businesses, and industrial areas will be maintained at all times. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur. The effects to properties will be mitigated by providing fair market value compensation in accordance with applicable laws and through negotiations with affected property owners. At this time, the final design of the station is not available and these requirements will be addressed at future stages of the project. Appropriate agreements will be executed. Temporary use of adjacent lands will be managed through the use of construction easements or Temporary Limited Interests (TLIs). Consultation and agreements with adjacent property owners will be obtained where temporary access is needed for maintenance activities.	**During Construction:** None anticipated at this time.
	During Operations: There is potential for an increase in property values for properties located in close proximity to a transit station due to an	**During Operations:** None anticipated at this time.	**During Operations:** None anticipated at this time.

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
	increase in transit service.		
Visual Characteristics			

Site and Surroundings	**During Construction:**
	Temporary visual and aesthetic effects may also be experienced as a result of temporary storage sites for equipment, staging/laydown areas, stockpiling of materials and other construction activities.
	Tree and vegetation removal may pose undesirable aesthetic effects to the surrounding land uses.
		During Construction:
		Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts.
		Metrolinx is establishing a Vegetation Compensation Protocol for RER projects. Vegetation that is removed will be compensated for in accordance with this Protocol as documented in Appendix C and Appendix B of this Volume
		Additional potential mitigation measures:
		• Provide a screened enclosure for the development site, with particular attention to the waste disposal and material storage areas.
		• Consider improving the aesthetic quality of the enclosure with graphics and/or artistic images that create visual interest for those viewing from the public realm and neighbouring lands.
		• The design considerations for buffers and screening of nuisances or unwanted effects should:
		  • Be appropriately located to obscure the view and access to the nuisances or unwanted impact; and
		  • Be designed to be relative to the magnitude of the nuisance or unwanted impact.
		Provide temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows.
			During Construction:
			None anticipated at this time.

	During Operations: The location of the rail line is an existing facility in place. The existing rail corridor is	**During Operations:** An aesthetically pleasing design will be developed for public-facing infrastructure in	**During Operations:** None anticipated at this time.

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
	visually screened from adjacent residential or sensitive land uses; with the use of a vegetative berm and wall along Brickworks Lane, and by the setback from Union Street. Considering this screening will continue in the future, or in the case of future development along Union Street, be a consideration of site development, there are no effects to the visual environment anticipated.	consultation with the adjacent landowners and through engaging the Metrolinx Design Review Panel.	
Built Form	**During Construction:** None anticipated.	**During Construction:** None anticipated at this time.	**During Construction:** None anticipated at this time.
	During Operations: The visual/aesthetic effects of the completed site will depend upon a variety of characteristics including: form of the development (massing, height, relationship to neighbouring land uses and the public realm); building façade materials; fenestration and visual permeability; landscape design; and, lighting (functional and decorative). The aesthetic quality and effects of the completed station will be the result of a combination of landscaping; compatible building massing, façade design and detailing; and, public realm design. This Project may spur an improvement in the visual environment compared to what exists today, by providing improved street lighting and public visibility. Light spillage effects may occur from lighting at the proposed station required for both the station itself, as well as ancillary infrastructure, such as the surface parking lots. Light reflected on trains at night may increase light spillage into adjacent properties.	**During Operations:** A lighting plan should be developed where the quality of light produced, and type of light sources used on the exterior of buildings, signs, parking areas, pedestrian walkways, and other areas of the site, are compatible with, and appropriate to the overall design and use of the site. Mitigation measures may include: • External visors on floodlights; • Optimal light location, height and settings; • Light shields such as walls of hedges; • Various intensities and control of lighting of the station and of parking lots for different scenarios; and • Shielded fixtures with efficient light bulbs in parking lots surrounding the station. Additional potential mitigation measures: • Blank walls that are adjacent to gathering areas, outdoor amenity spaces, and pedestrian walkways should have aesthetic character improved with any combination of architectural detailing, landscape features, art, or other elements that provide visual relief and interest. • Paving should be reduced to the minimum necessary to accomplish site circulation and parking needs with other areas set aside for landscaping, or pedestrian ways as needed.	**During Operations:** None anticipated at this time.

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
		The landscape design should add visual interest, define pedestrian zones, and provide visual screens and buffers for incompatible uses.	
Public Realm	**During Construction:** Adverse effects may arise from the presence of construction materials; equipment; modular construction trailers for housing on-site offices and facilities, which will either temporarily eliminate public realm elements or impede access to the public realm. Potential effect on individuals ability to use and move through the study area during construction.	**During Construction:** Provide well connected, clearly delineated, and appropriately signed walkways and cycling route options. Provide temporary lighting and wayfinding signs and cues for navigation around the construction site.	**During Construction:** None anticipated at this time.
	During Operations: Due to the industrial nature of the area to the east of the Project, and the buffered nature of the community to the west, it is expected that the Project and accompanying increases in connectivity will promote improvements to the public realm, particularly along Union Street and areas envisioned for development. Increased ability for individuals to travel to and through the public realm in the vicinity of the station.	**During Operations:** The landscape design and public realm features should add visual interest, define pedestrian zones, distinguish private and public realms, delineate different spaces and use areas on site, contribute to comfort and health of users, provide visual screens and buffers for incompatible uses. The overall site design and station architecture should provide necessary infrastructure and the careful arrangement of uses to accordingly provide for accessibility throughout.	**During Operations:** None anticipated at this time.
Crime Prevention Through Environmental Design	**During Construction:** None anticipated.	**During Construction:** None anticipated at this time.	**During Construction:** None anticipated at this time.
	During Operations: The project is considered to be supportive in further activating land uses along St. Clair Avenue in the form of the nearby shopping centre by increasing pedestrian traffic in the area, and bringing new customers in via transit.	**During Operations:** • The building façade materials and fenestration should allow for passive surveillance and be fitting with the context of the neighbouring uses. • Parking lots should be configured, designed and landscaped as well-defined areas linked to a particular building/station entrance with dedicated pedestrian ways that are safe and convenient. • The site design should integrate uses,	**During Operations:** None anticipated at this time.

Feature	Potential Effect	Mitigation Measures	Monitoring Recommendation
		transportation facilities, landscape elements, public spaces and buildings in such a way that they support safe, efficient, and comfortable use.	
Policy Context - Zoning			
Provincial Policies	**During Construction:** None anticipated.	**During Construction:** None anticipated at this time.	**During Construction:** None anticipated at this time.
	During Operations: The Project achieves policy objectives as outlined in the *Provincial Policy Statement,* The *Growth Plan for the Greater Golden Horseshoe,* and the *Metrolinx Regional Transportation Plan.*	**During Operations:** None anticipated at this time.	**During Operations:** None anticipated at this time.
Municipal Policies	**During Construction:** None anticipated.	**During Construction:** None anticipated at this time.	**During Construction:** None anticipated at this time.
	During Operations: The final design of the station may not be in conformance with some long-term municipal policy context. The project is considered to be supportive of the Official Plan and zoning objectives of the area.	**During Operations:** Under the *Metrolinx Act, 2006*, Metrolinx is exempt from municipal permitting and approval requirements within Metrolinx-owned lands; regardless, Metrolinx works in co-operation with municipalities and participates in a voluntary project review process.	**During Operations:** None anticipated at this time.
Current Development Applications			
Current Development Applications	**During Construction:** No direct effects to the lands that are under development application within the surrounding area are anticipated during the construction of the Project.	**During Construction:** None anticipated to be required at this time	**During Construction:** None anticipated to be required at this time
	During Operations: Implementation of the station is likely to make the area more attractive for new growth and development.	**During Operations:** None anticipated at this time.	**During Operations:** None anticipated at this time.

4.7 Air Quality

4.7.1 Overview

The Project's air quality effects were predicted at a selection of representative sensitive receptors within the study area, as shown in Figure 3-10.

The modelling results for the selected COCs for the 20 most affected sensitive receptors are reported in Table 4-6. For most of COCs, receptor R1 located 52 m east of the corridor is the most affected receptor. Additional information about the most affected receptors for each COC is available in Appendix E of this Volume. Table 4-6 shows the changes in air quality due to the development of the Project. The comparison of the modelling results between the 2028 scenarios and the 2017 Current Scenario shows the effects to local air quality due to electrification.

The Full-Build scenario results in marginally higher contaminant concentrations compared to the No-Build scenario at the most affected receptors near the Project. This is due to the addition of a bus lay-by and the increased deceleration, acceleration and total travel time through the study area of the remaining diesel trains due to the change of speed profiles from the Project. The overall increase is marginal, with a maximum single contaminant increase of 2.6% of the background concentration being attributable to the Project, and an average of all contaminant increases of 0.3% of the background concentrations as a result of the Project.

Anticipated increased ridership on the Kitchener rail corridor is expected to reduce passenger car trips, which is not assessed within this localized assessment. Details of air dispersion modelling results including maximum, median and percentile values for the 20 most affected receptors is provided in Appendix G of this Volume.

Table 4-6: Summary of Project's Contribution to COC Concentrations at the Most Affected Sensitive Receptor (Project Effects)

Contaminant	Averaging Period	Current 2017 Conditions (µg/m³)	Future 2028 No Build (µg/m³)	Future 2028 Full-Build (µg/m³)	Air Quality Threshold (µg/m³)
NO_2	1 hour	2.25	1.47	2.75	83
	24 hour	0.584	0.124	0.422	200
	Annual	0.150	0.0311	0.102	24
CO	1 hour	0.603	0.385	1.37	36200
	8 hour	0.373	0.152	0.481	15700
PM2.5	24 hour	0.0154	0.00463	0.0147	27
	Annual	0.00419	0.00121	0.00369	8.8
Acetaldehyde	30 minute	0.000276	0.000975	0.00423	500
	24 hour	0.000202	0.000200	0.00147	500
Acrolein	1 hour	0.00243	0.000457	0.00198	4.5
	24 hour	0.000889	0.0000469	0.000344	0.4
Benzene	24 hour	0.00215	0.000110	0.000832	2.3
	Annual	0.000554	0.0000287	0.000176	0.45
1,3-Butadiene	24 hour	0.00000780	0.000000411	0.00000301	10
	Annual	0.00000201	0.000000104	0.000000639	2
Benzo	24 hour	1.82E-08	7.66E-09	7.35E-08	5.00E-05

Contaminant	Averaging Period	Current 2017 Conditions (µg/m³)	Future 2028 No Build (µg/m³)	Future 2028 Full-Build (µg/m³)	Air Quality Threshold (µg/m³)
(a)pyrene	Annual	4.705E-09	1.94E-09	1.56E-08	1.00E-05
Formaldehyde	24 hour	0.0116	0.000630	0.00462	65

The cumulative effects due to the proposed Project were calculated by aggregating the Project specific modelling results with the 90th percentile background ambient concentrations. The cumulative effects were compared to air quality thresholds and the percentage is presented in Table 4-7.

The cumulative air quality effects of the Project are predicted to be below the air quality thresholds, with the exception of annual benzene and 24 hour and annual benzo(a)pyrene, which already exceed the air quality thresholds from 90th percentile ambient background concentrations. The cumulative air quality effects of the Project are predicted to marginally increase for all contaminants but not cause exceedance of any contaminants that are not already exceeding the respective thresholds. The maximum Project contribution to the concentration of contaminants already exceeding their threshold from ambient background concentrations is predicted to be 0.04% of the background concentration and considered to have a very small effect on the ambient pollutant concentrations that does not require consideration of mitigation.

Table 4-7: Summary of Maximum Predicted COC Concentrations at the Most Affected Sensitive Receptor (Cumulative Effects)

Contaminant	Averaging Period	Background Values (µg/m³)	Current Conditions 2017 Cumulative Concentrations (µg/m³)	Future 2028 No-Build Cumulative Concentrations (µg/m³)	Future 2028 Full-Build Cumulative Concentrations (µg/m³)	Air Quality Threshold (µg/m³)	Percent of Threshold 2017	Percent of Threshold 2028 No-Build	Percent of Threshold 2028 Full-Build
NO_2	1 hour	49.1	51.35	50.57	51.85	83	61.9%	60.9%	62.5%
	24 hour	40.9	41.48	41.02	41.32	200	20.7%	20.5%	20.7%
	Annual	**27.7**	**27.85**	**27.73**	**27.80**	**24**	**116.0%**	**115.5%**	**115.8%**
CO	1 hour	441	441.60	441.38	442.37	36200	1.2%	1.2%	1.2%
	8 hour	424	424.37	424.15	424.48	15700	2.7%	2.7%	2.7%
$PM_{2.5}$	24 hour	14	14.015	14.005	14.015	27	51.9%	51.9%	51.9%
	Annual	8.7	8.70419	8.70121	8.70369	8.8	98.9%	98.9%	98.9%
Acetaldehyde	30 min.	-	0.000276	0.000975	0.00423	500	0.00006%	0.0002%	0.0009%
	24 hour	1.4	1.400202	1.400200	1.40147	500	0.3%	0.3%	0.3%
Acrolein	1 hour	-	0.000889	0.0000469	0.000344	0.4	1.0%	1.0%	1.0%
	24 hour	0.2	0.20243	0.200457	0.20198	4.5	4.5%	4.5%	4.5%
Benzene	24 hour	1	1.00215	1.000110	1.000832	2.3	43.6%	43.5%	43.5%
	Annual	**0.8**	**0.800554**	**0.8000287**	**0.8001764**	**0.45**	**177.9%**	**177.8%**	**177.8%**
1,3-Butadiene	24 hour	0.099	0.09900780	0.09900041	0.09900301	10	1.0%	1.0%	1.0%
	Annual	0.053	0.053002011	0.053000104	0.053000639	2	2.7%	2.7%	2.7%
Benzo (a)pyrene	**24 hour**	**0.000182**	**0.0001820182**	**0.0001820077**	**0.0001820735**	**5.00E-05**	**364.0%**	**364.0%**	**364.1%**
	Annual	**0.000132**	**0.00013200471**	**0.00013200194**	**0.0001320156**	**1.00E-05**	**1320%**	**1320%**	**1320%**
Formaldehyde	24 hour	4.2	4.2116	4.2006	4.2046	65	6.5%	6.5%	6.5%

4.7.2 Potential Effects, Mitigation and Monitoring

Potential effects, corresponding mitigation measures and monitoring activities relating to air quality are described in Table 4-8.

Further details on potential effects, mitigation and monitoring are provided in Appendix G of this Volume.

Table 4-8: Air Quality Environment - Potential Effects, Mitigation and Monitoring

Feature	Description of Potential Effect	Mitigation Measures	Monitoring Activity
Construction			
Air Quality	Air emissions associated with construction activities may include: 1. Total Suspended Particles (TSP), particulate matter less than 10µm (PM_{10}) and fugitive dust emissions resulting from: • Stockpiling of soils and other friable materials; • Granular material loading and unloading activities; • Transportation of soils and other friable materials via dump trucks; • Movement of heavy and light vehicles on paved and unpaved roads; • Soil excavation and filling activities required to facilitate the modified site layout for the new station; • Demolition of structures necessary to accommodate the new station; and • Cutting of existing concrete. 2. Emissions resulting from the combustion engines of construction equipment.	• An Air Quality Management Plan will be developed for implementation during construction to address construction equipment and vehicle exhaust, potential traffic disruption and congestion, fugitive dust and odour. Potential mitigation measures that may be included in the Air Quality Management Plan include: • Dust suppression measures (e.g., application of water wherever appropriate, or the use of approved non-chloride chemical dust suppressants, where the application of water is not suitable) will conform to recognized standard specifications such as the ChemInfo Services Inc. March 2005 publication "Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities" prepared for Environment Canada; • Use of dump trucks with retractable covers for the transport of soils and other friable materials; • Minimize the frequency of loading and unloading of soils and other friable materials; • Minimize drop heights, use enclosed chutes, and cover bins for debris associated with deconstruction of affected structures; • Washing of equipment and/ use of mud mats where practical at construction site exits to limit the migration of soil and dust off-site; • Dust monitoring in locations where it has been determined that a particulate bound contaminant of concern exists in native soil; • Stockpiling of soil and other friable materials in locations that are less exposed to wind	• Construction activities will be monitored by a qualified construction inspector who will frequently review the efficacy of the mitigation measures and construction best management practices to confirm they are functioning as intended. In the event that mitigation is found to be ineffective, revised mitigation measures designed to improve effectiveness will be implemented. Dust levels will be monitored daily by the Contractor and frequently by the construction inspector to assess the effectiveness of dust suppression measures, and adjust as required; • Monitoring will continue throughout the construction phase until activities are complete, all exposed soils have been stabilized, and all construction waste has been removed from site. • A complaint response protocol for nuisance effects such as dust will be established. • Regular inspections of dust emissions (frequency to be defined prior to project construction) to confirm dust control watering frequency and rates are adequate; and, • Site supervisors should monitor the site for wind direction and weather conditions to ensure that high-impact activities be reduced when the wind is blowing consistently towards nearby sensitive receptors. The site

Feature	Description of Potential Effect	Mitigation Measures	Monitoring Activity
		(e.g., protected from the wind by suitable barriers or wind fences/screens, or covered when long-term storage is required) and away from sensitive receptors to the extent possible; • Reduction of unnecessary traffic and implementation of speed limits; • Permanent stabilization of exposed soil areas with non-erodible material (e.g., stone or vegetation) as soon as practicably possible after construction in the affected area is completed; • Ensuring that all construction vehicles, machinery, and equipment are equipped with current emission controls, which are in a state of good repair; and • Dust-generating activities should be minimized during conditions of high wind; and, • Other mitigation techniques can be found in Environment Canada "Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities" (Environment Canada, 2013).	supervisor should also monitor for visible fugitive dust and take action to determine the root-cause in order to counteract this. Specific details regarding monitoring should be included in the Air Quality Management Plan.
Operations and Maintenance			
Air Quality	• During the operation of the Project, there are minimal predicted effects to air quality. The areas surrounding the station are naturally ventilated areas, so there is minimal risk to human exposure to COCs. Roadway dust, emergency generator exhausts (GHGs and COCs), and any air handling equipment for conditioned spaces are also potential sources of operation air emission sources; • Major source of air emissions will be generated by the combustion engines from the buses travelling in the bus lay-by; • Air emissions from the combustion engines of	• Operations and maintenance of rail infrastructure will be carried out in accordance with applicable regulations and standards, including Environmental Activity and Sector Registry (EASR) and Environmental Compliance Approval (ECA) applications (Ontario Reg. 1/17 and 419/05). • To improve l air quality around the station during maintenance and operation, several solutions can be implemented, such as: • Signed speed limits on the rail corridor for locomotives;	• Metrolinx maintains ongoing inspection schedules to monitor the effectiveness of its GO Transit operations. A complaints procedure is in place during operations to address concerns raised by neighbouring land owners, municipalities, or the public-at-large.

Feature	Description of Potential Effect	Mitigation Measures	Monitoring Activity
	emergency generators located at the Project (GHGs, COCs); and, • Air emissions from the combustion of natural gas in heating and ventilation equipment located at the Project (GHGs, COCs).	• Improve walkways and trail connections to increase the number of passengers that are walking or cycling to access the station; • Ensure fleet vehicles are properly maintained and kept in good working condition in terms of engine emission tune-ups; • Testing of any standby emergency generators to occur for minimum duration and testing to be conducted one at a time, where applicable; and, • Adherence to MOECC Environmental Activity and Sector Registry (EASR) recommendations for exempt equipment that has minimal air quality impacts, as well as application to the EASR for equipment that qualifies (O. Reg. 1/17 and O. Reg.419/05).	

4.8 Noise and Vibration

4.8.1 Overview

Sensitive receptors within the identified NSAs were selected based on the geographical and land use context in the vicinity of the Project. NSAs are shown in Figure 3-11. Sensitive receptor locations are shown in Figure 3-12.

Construction noise levels were predicted as per the Roadway Construction Noise Model methodology contained in the FTA *Transit Noise and Vibration Impact Assessment* publication (Federal Transit Administration, 2006). The sound levels at the receptor location for each piece of equipment are then summed to determine the overall construction sound levels at each identified noise receptor. Table 4-9 presents the predicted construction sound levels at each receptor.

Daytime and nighttime construction sound levels during the worst-case scenario are expected to exceed the FTA criterion for R3 to R5, R7 to R9, R21 to R28 receptors, as detailed below.

Table 4-9: Construction Noise Impact Assessment (Worst Case)

Receptor	Distance to Construction (m)	Noise Level, L_{eq} 1hr (dBA)			Exceeds Criterion?
		Day-time Criterion	Night-time Criterion	Predicted	
R1	105	90	80	67	No
R2	66	90	80	72	No
R3	19	90	80	90	**Yes (night-time)**
R4	23	90	80	88	**Yes (night-time)**
R5	9	90	80	98	**Yes (day and night)**
R6	59	90	80	78	No
R7	19	90	80	90	**Yes (night-time)**
R8	5[1]	90	80	105	**Yes (day and night)**
R9	38	90	80	83	**Yes (night-time)**
R10	79	90	80	70	No
R11	77	90	80	70	No
R12	72	90	80	71	No
R13	101	90	80	67	No
R14	162	90	80	67	No
R15	201	90	80	65	No
R16	261	90	80	57	No
R17	296	90	80	60	No
R18	67	90	80	71	No
R19	102	90	80	72	No
R20	79	90	80	75	No

Receptor	Distance to Construction (m)	Noise Level, L_{eq} 1hr (dBA)			Exceeds Criterion?
		Day-time Criterion	Night-time Criterion	Predicted	
R21	23	90	80	88	**Yes (night-time)**
R22	23	90	80	88	**Yes (night-time)**
R23	22	90	80	89	**Yes (night-time)**
R24	21	90	80	89	**Yes (night-time)**
R25	21	90	80	89	**Yes (night-time)**
R26	19	90	80	90	**Yes (night-time)**
R27	17	90	80	91	**Yes (day and night)**
R28	22	90	80	89	**Yes (night-time)**

Note: [1] Where receptors are located within the project footprint, for analysis purposes it is assumed a minimum distance of 5 m from construction activities would be maintained.

Table 4-10 presents the predicted operations sound levels for all three scenarios.

Table 4-10: Operations Noise Impact Assessment

Receptor	Period	Predicted Noise Level (dBA)			Adjusted Impact Level[4]	Adjusted Impact Rating[5]
		Existing Rail[1]	Pre-Project[2]	Post-Project[3]		
R1	D	44.0	52.9	53.0	0.1	Insignificant
	N	38.2	47.7	48.1	0.4	Insignificant
R2	D	45.2	54.0	54.2	0.2	Insignificant
	N	39.4	48.8	49.5	0.7	Insignificant
R3	D	44.1	52.8	53.2	0.4	Insignificant
	N	38.2	47.6	48.6	1.0	Insignificant
R4	D	41.8	50.4	50.7	0.3	Insignificant
	N	35.9	45.1	46.1	1.0	Insignificant
R5	D	39.9	48.4	48.7	0.3	Insignificant
	N	34.1	43.2	43.9	0.7	Insignificant
R6	D	38.9	46.9	47.2	0.3	Insignificant
	N	33.0	41.7	42.3	0.6	Insignificant
R7	D	39.4	47.8	48.1	0.3	Insignificant
	N	33.5	42.6	43.4	0.8	Insignificant
R8	D	48.8	57.2	57.5	0.3	Insignificant
	N	42.9	52.1	52.8	0.7	Insignificant
R9	D	40.7	48.9	49.3	0.4	Insignificant
	N	34.7	43.7	44.5	0.8	Insignificant
R10	D	45.8	54.4	55.0	0.6	Insignificant
	N	40.1	49.3	50.5	1.2	Insignificant
R11	D	41.6	49.3	50.1	0.8	Insignificant
	N	35.6	43.9	45.2	1.3	Insignificant
R12	D	42.5	50.2	50.8	0.6	Insignificant
	N	36.4	44.7	45.8	1.1	Insignificant
R13	D	48.5	57.0	57.9	0.9	Insignificant
	N	43.5	52.3	53.8	1.5	Insignificant

Receptor	Period	Predicted Noise Level (dBA)			Adjusted Impact Level[4]	Adjusted Impact Rating[5]
		Existing Rail[1]	Pre-Project[2]	Post-Project[3]		
R14	D	53.0	60.9	62.2	1.3	Insignificant
	N	47.6	55.9	57.8	1.9	Insignificant
R15	D	53.6	61.5	62.7	1.2	Insignificant
	N	48.3	56.6	58.4	1.8	Insignificant
R16	D	45.8	54.0	55.2	1.2	Insignificant
	N	40.3	48.9	50.7	1.8	Insignificant
R17	D	46.1	54.4	55.7	1.3	Insignificant
	N	40.8	49.5	51.5	2.0	Insignificant
R18	D	46.9	55.1	55.5	0.4	Insignificant
	N	41.2	50.0	50.9	0.9	Insignificant
R19	D	47.7	55.9	56.4	0.5	Insignificant
	N	41.9	50.8	51.8	1.0	Insignificant
R20	D	51.7	59.9	60.3	0.4	Insignificant
	N	45.9	54.8	55.6	0.8	Insignificant
R21	D	57.7	64.3	64.4	0.1	Insignificant
	N	52.2	59.0	59.4	0.4	Insignificant
R22	D	53.6	60.3	60.2	-0.1	None
	N	48.1	55.0	55.0	0.0	None
R23	D	54.3	61.0	61.0	0.0	None
	N	48.8	55.7	55.7	0.0	None
R24	D	57.3	63.6	63.6	0.0	None
	N	51.8	58.3	58.3	0.0	None
R25	D	50.9	57.8	57.8	0.0	None
	N	45.4	52.6	52.6	0.0	None
R26	D	53.6	60.2	60.2	0.0	None
	N	48.2	55.0	55.0	0.0	None
R27	D	50.5	57.3	57.3	0.0	None
	N	45.1	52.2	52.1	-0.1	None
R28	D	56.2	62.2	62.2	0.0	None
	N	50.6	56.7	56.8	0.1	Insignificant

Notes: 1 - Existing and future rail noise levels calculated using CadnaA Version 2018 noise prediction software, using the operational data presented in Tables 2-1 and 4-4 in Appendix H of this Volume.
2 - Pre-project noise level is the combination of the ambient noise and future no-build rail noise.
3 - Post-project noise level is the combination of the ambient noise and future build rail noise.
4 - Adjusted Noise Impact is based on the difference between pre-project and post-project noise levels.
5 - Mitigation is only required when 'significant or greater' impact is predicted.
D - Day-time 16hr L_{eq} (07:00 - 23:00)
N - Night-time 8hr L_{eq} (23:00 - 07:00)

Vibration levels were modelled using the *General Method* presented in the FTA's *Transit Noise and Vibration Impact Assessment* guide.

Table 4-11 shows the two most impactful pieces of equipment and resulting ZOI. It is noted that pile driving is not expected to occur during construction.

Table 4-11: Construction Vibration ZOI

Equipment	Reference Peak Particle Velocity at 7.6 m (mm/s)	Zone of Influence (m)
Auger-Piling/Caisson Drilling	2.26	4.5
Vibratory Roller	5.33	8.0

Table 4-12 lists the receptor that is within the proposed construction zone. No other receptors are less than eight metres away from the edge of proposed construction zone (i.e. ZOI).

Table 4-12: Receptor within the Vibration ZOI

Receptor	Municipal Address	Distance to Construction Zone (m)
R8	1866 St Clair Avenue West	5

Note: Where receptors are located within the project footprint, it is assumed a minimum distance of 5 m from construction activities would be maintained.

Table 4-13 summarizes the predicted RMS vibration velocities at the representative receptor locations for each scenario. Although existing vibration levels were measured at three representative locations, the provided profile speeds were used to calculate vibration levels at all receptor locations for existing, future no-build, and future build conditions for consistency in the comparison.

Future build vibration levels at nearly all receptors are expected to be equal to or less than the future no-build vibration levels after implementation of the Project, because future express trains would generally be traveling at the same speeds as existing and future no-build conditions. However, the predicted vibration level at receptors R22 through R24 are expected to increase above the objective vibration level by 0.01 to 0.03 mm/sec, which corresponds to an increase of 6 to 24 percent.

Table 4-13: Operations Vibration Impact Assessment

Receptor	Distance to Track (m)	RMS Vibration Velocity (mm/sec)		Exceeds Objective by more than 25%?
		Objective[1]	Difference	
R1	190	0.14	-0.13	No
R2	176	0.14	-0.13	No
R3	165	0.14	-0.12	No
R4	220	0.14	-0.13	No
R5	278	0.14	-0.14	No
R6	248	0.14	-0.13	No
R7	227	0.14	-0.13	No
R8	111	0.14	-0.09	No
R9	186	0.14	-0.12	No
R10	132	0.14	-0.11	No
R11	98	0.14	-0.09	No
R12	77	0.14	-0.07	No
R13	56	0.14	-0.05	No
R14	41	0.14	-0.01	No

Receptor	Distance to Track (m)	RMS Vibration Velocity (mm/sec)		Exceeds Objective by more than 25%?
		Objective[1]	Difference	
R15	50	0.14	-0.04	No
R16	107	0.14	-0.10	No
R17	91	0.14	-0.09	No
R18	72	0.14	-0.08	No
R19	117	0.14	-0.11	No
R20	96	0.14	-0.10	No
R21	37	0.14	-0.01	No
R22	38	0.14	0.03	No
R23	39	0.14	0.02	No
R24	38	0.14	0.01	No
R25	36	0.14	0.00	No
R26	37	0.14	0.00	No
R27	38	0.14	0.00	No
R28	45	0.14	-0.03	No

Note: [1] Highest value between the Protocol objective vibration velocity of 0.14 mm/s, or measured vibration velocity.

4.8.2 Potential Effects, Mitigation and Monitoring Measures

Potential effects, corresponding mitigation measures and monitoring activities relating to noise and vibration are described in Table 4-14.

Further details on potential effects, mitigation and monitoring are provided in Appendix H of this Volume.

Table 4-14: Noise and Vibration Environment - Potential Effects, Mitigation and Monitoring

Feature/Location of Potential Effect	Potential Effect	Mitigation Measure	Monitoring Activity
Noise - Construction			
Representative receptors shown in Figure 4-1.	Temporarily Increased Sound Levels due to Construction	• A Noise and Vibration Control Plan will be developed prior to construction. The plan will include a complaint response protocol and will indicate that surrounding property owners and tenants will be informed of anticipated upcoming construction works, including any work at night. • A more detailed noise assessment of construction should be completed when the specifics of construction equipment are finalized, prior to construction start. This assessment should consider minimizing construction-related noise levels, while balancing construction schedules and expediting construction activity. • Trains passing construction zones may be required to use bells and/or whistles to warn construction personnel for safety reasons. This should be minimized as much as practical while promoting safety. • Construction equipment has safety features such as backup alarms (beeping sound). This is for the protection and safety of workers. Consideration will be given to the use of broadband rather than tonal backup beepers. • Construction should adhere to the City of Toronto noise by-laws (Noise Control By-Law, Municipal Code Chapter 591, By-law 1400-2007), summarized in Section 3.2.1.2, to the extent possible. • To the extent possible, nighttime construction activities should be avoided to reduce the potential impact of construction noise. Certain types of construction work can only be completed when trains are not in service (i.e., outside of business hours). Construction should be planned to minimize the number of nights where noisy nighttime construction activities may be required. • All construction equipment used should be in good repair and properly maintained to limit noise emissions. All construction equipment should be operated with effective muffling devices that are in good working order and idling of construction equipment kept to a minimum to reduce noise from construction activities. Unnecessary noise caused by faulty or non-operating components shall be addressed by regularly maintaining all equipment. • Noise emissions from construction equipment are to comply with the limits set out in NPC-115, NPC-118, and US Federal guidelines presented in Tables 3-1 through 3-3.	None anticipated to be required at this time. Potential monitoring locations presented in Figure 4-1.
Noise - Operations			
Representative receptors shown	Increase of less than 2 dB	None.	None.

Feature/Location of Potential Effect	Potential Effect	Mitigation Measure	Monitoring Activity
in Figure 3-12.			
Noise - Stationary			
Representative receptors shown in Figure 3-12.	Potential increase in noise levels	• During detailed/final design, the station public address system, ancillary systems, and any other stationary noise sources shall be designed so that the one-hour equivalent sound level does not exceed the higher of the applicable exclusion limit value given in NPC-300, or the background sound level.	None.
Vibration - Construction			
Representative receptors presented in Figure 4-2.	Temporarily Increased Vibration Levels due to Construction	• A Noise and Vibration Control Plan will be developed prior to construction. The plan will include a complaint response protocol and will indicate that surrounding property owners and tenants will be informed of anticipated upcoming construction works, including any work at night. • A more detailed vibration assessment of construction should be completed when the specifics of construction equipment are finalized, prior to construction start. This assessment should consider minimizing construction-related vibration levels, while balancing construction schedules and expediting construction activity. • It is recommended that the vibration limits in the City of Toronto by-law not be exceeded. This may entail monitoring of vibration levels during construction. Anticipated vibration levels will be confirmed during detailed design. • During detailed design, the predicted ZOI should be updated to confirm which structures fall within it. If a structure falls within the updated ZOI, the following is recommended: ◆ Pre-construction consultations with owners/occupants; ◆ Pre-construction measurements of background vibration levels; and ◆ Pre-construction survey by means of a photographic record of potentially affected structure façades and all surfaces, including visible sections of building foundations, building cladding, doors, windows, interior wall finishes, surface pavement, sidewalks, signs and trees. Each of the elements should be rated on their general condition (new, good, fair, poor, severe), and visible defects should be photographed.	• Consideration should be given to monitoring of vibration during vibration-intensive activities, to confirm that levels do not approach those required for structural damage • Once a detailed construction vibration assessment has been completed, work that may exceed the vibration limits in the City of Toronto bylaw or that may cause structural damage should be monitored
Vibration - Operations			
Representative receptors shown in Figure 3-12.	Overall Decreased Vibration Levels Increase of less than 25% at three receptors	• During detailed design, the effects of any discontinuities such as crossovers or switches need to be assessed at the adjacent vibration sensitive land uses.	• None.

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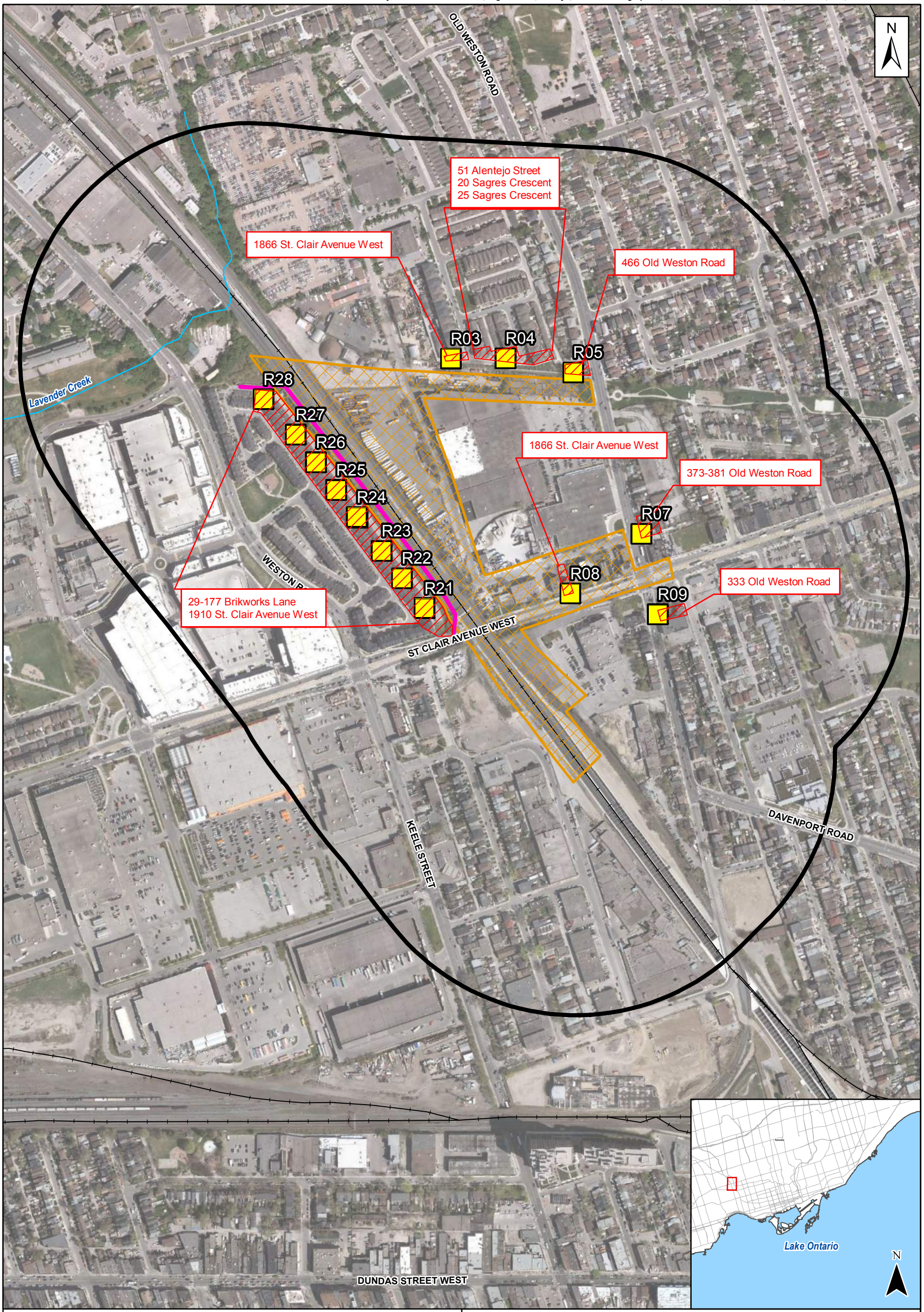

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Legend

- Study Area - 300 Metres
- Proposed Project Footprint (approximate)
- Permanent Watercourse
- Railway
- Existing Noise Barriers
- Potentially Affected Land Use (Due to Construction Noise)
- Potential Construction Noise Monitoring Location

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
Watercourses - Land Information Ontario
Project Footprint - Initial Preferred Designs
Receptor Data - Parsons

0 50 100 200 Metres

Project:	**New SmartTrack Station**		
Figure Title:	**St. Clair-Old Weston SmartTrack Station Potential Construction Noise Monitoring Locations**		
Prepared By:	4TRANSIT PARSONS HATCH WSP	**Date:**	**July 06 2018**
Version: CW.EPR.100-1	**Review:**	**Figure:** 4-1	

Aerial Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

User Name: p002247D

OLD WESTON ROAD

N

Lavender Creek

1866 St. Clair Avenue West

R08

WESTON ROAD

ST CLAIR AVENUE WEST

KEELE STREET

DAVENPORT ROAD

DUNDAS STREET WEST

Lake Ontario

N

Legend

- Study Area - 300 Metres
- Proposed Project Footprint (approximate)
- Permanent Watercourse
- Railway
- Existing Noise Barriers
- Potentially Affected Land Use (Due to Construction Vibration)
- Potential Construction Vibration Monitoring Location

DATA SOURCES:

Roads and Railways - Ontario Open Data Catalogue
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Receptor Data - Parsons

0 50 100 200 Metres

Project:	**New SmartTrack Station**
Figure Title:	**St. Clair-Old Weston SmartTrack Station** **Potential Construction Vibration Monitoring Locations**
Prepared By:	4TRANSIT PARSONS HATCH WSP
Date:	**July 06 2018**
Version: CW.EPR.100-1	**Review:**
Figure:	**4-2**

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4.9 Traffic and Transportation

4.9.1 Overview

Due to adjacent planned developments associated with the St. Clair West TMP, the study area transportation network will differ from existing conditions. The recommended changes are:

- Widening St. Clair Avenue West between Keele Street and Old Weston Road (from 1 lane to 2 lanes in each direction);
- Extending Gunns Road easterly from Weston Road to Union Street;
- Extending Keele Street southerly from south of Rogers Road to the Gunns Road extension;
- Extending Davenport Road northerly from Old Weston Road as an overpass over St. Clair Avenue West and connecting to Union Street.
- Improved cycling facilities (MUPs) on the west side of Union Street between Townsley Street and Turnberry Road/Gunns Road extension and west side of Davenport Road extension between Townsley Street and Davenport Road/Old Weston Road;
- MUPs along the south side of the Gunns Road extension, the west side of Union Street, and the Davenport extension to facilitate access to the station;
- The extension of Lavender Creek Trail to the intersection of Gunns Road and Weston Road; and
- Bike lanes on both sides of the Keele Street extension.

The implementation of these recommendations will change the configuration of the existing critical intersections, and create new intersections with access to the station site, as follows:

- Extending Davenport Road northwest over St. Clair Avenue West will change the Union Street/Townsley Street intersection from a two-leg intersection to a T-intersection and the Davenport Road/Old Weston Road from a T-intersection to a four-leg intersection;
- Extending Gunns Road easterly from Weston Road to Union Street will change the Union Street/Turnberry Street intersection and the Gunns Road/Weston Road intersection from existing T-intersections to four-legged intersections; and
- Extending Keele Street south to the Gunns Road extension will create a new T-intersection.

In addition, future bus services are anticipated to operate along the new roadway expansions proposed in the St. Clair Avenue West TMP, including the Davenport Road, Keele Street and Gunns Road extensions, and Union Street.

Anticipated changes as a result of the Project are:

- An increase in vehicle and pedestrian/cyclist volumes at the two existing intersections, that is, Union Street and Townsley Street, and Union Street and Turnberry Street.

Consideration will be given to the installation of 3 or 4-way stops (depending on location) or signals for safety purposes to accommodate these increases.

- TTC bus routes are anticipated to be re-routed to better serve St. Clair-Old Weston SmartTrack Station with the use of a dedicated bus lay-by on Union Street. None of the possible TTC bus route changes have been formally approved.
- Pedestrian and cycling accessibility and connectivity to the station will be provided from either side of the rail corridor.
- A secured bike shelter will be provided near the southern main station entrance (on the east side of the rail corridor), and additional bicycle facilities will be provided at both station entrances on the east side of the rail corridor.

The City of Toronto's 10-Year Cycling Plan describes one initiative to improve cycling infrastructure near the station site: a trail/boulevard trail along the rail corridor.

As a result of these infrastructure improvements, as well as overall development and growth in the study area, it is anticipated that there will be an increase in pedestrian and cycling activities.

For the purposes of the transportation study, the amount of vehicular traffic generated by the Project was estimated to determine whether a comprehensive Transportation and Traffic Impact Study (TTIS) is required. Based on the City of Toronto's guidelines, a TTIS is required if a proposed development generates at least 100 net additional peak direction vehicle trips in the peak hour or impacts critical movements at area intersections. This threshold is defined by the City's Guidelines for the Preparation of Transportation Impact Studies, and is used to determine where the site-generated traffic might result in a noticeable change in the level of service on abutting roads, generate the need for transportation infrastructure (e.g., traffic control signals) or require the implementation of mitigating measures such as the construction of separate turn lanes (City of Toronto, 2013).

A full description of the development of the mode split forecast is included in Appendix I of this Volume. Existing local GO Transit station characteristics were used as a basis for the forecast mode split for the Project. As there will be no commuter parking at the station, all auto trips will be attracted and/or generated by informal PPUDO.

The forecast mode splits are shown in Table 4-15.

Table 4-15: Mode Splits for St. Clair-Old Weston SmartTrack Station

Mode	A.M. Peak		P.M. Peak	
	Boarding	Alighting	Boarding	Alighting
Walking	46%	70%	70%	54%
Local Transit	35%	25%	25%	23%
Cycling	3%	5%	5%	4%
Passenger Pick-Up/Drop-Off	16%	0%	0%	19%
Carpool Passengers	0%	0%	0%	0%
Drive and Park	0%	0%	0%	0%

Table 4-16 summarizes the total number of trips that are predicted to be created by the Project. The number of trips generated for each mode is the number of total boarding/total alighting occurring at the station, multiplied by the mode splits in Table 4-15. As illustrated, the total number of auto trips (PPUDO) generated for the station is less than 100 in all cases except the A.M. boarding period.

Table 4-16: St. Clair-Old Weston SmartTrack Station Trip Generation Summary

Mode	A.M. Peak		P.M. Peak	
	Boarding	Alighting	Boarding	Alighting
Walking	287	28	56	238
Local Transit	221	10	20	100
Cycling	20	2	4	17
Passenger Pick-Up/Drop-Off	102	0	0	85
Carpool Passengers	0	0	0	0
Drive and Park	0	0	0	0

The distribution of trips to the road network was determined based on existing trip patterns and existing land use surrounding the station site. Details of the distribution for all modes is included in Appendix I of this Volume.

The assignment of trips to the road network was based on the available routes and access points to the station, as well as the key intersections listed in Section 3.8.2.1 surrounding the station area. Details of the assignment for all modes is included in Appendix I of this Volume.

There is a maximum of 102 auto trips during the A.M. peak hour and 85 auto trips during the P.M. peak hour generated by the informal PPUDO. These trips will spread across the entire network, including three key intersections listed in Section 3.8.2.1.

Compared to the anticipated auto trips generated by the nearby future developments which are expected to have direct and more significant effects on the intersections adjacent to the station, the informal PPUDO trips generated by the Project (estimated conservatively) are negligible.

Given that the configuration of all three critical intersections are under development as per the St. Clair Avenue West TMP, the ability to ascertain if there will be any operational issues at these intersections is limited at this time; however, it is not anticipated that there will be any major operational issues due to the increased vehicle trips associated with the Project.

Similar to vehicle operations, it is difficult at this time to determine if there will be any operational issues with regards to pedestrian or cyclist operations at the three critical intersections. The effects of these trips will be spread out across the network and pedestrians and cyclists will use multiple routes to access the station, e.g., St. Clair Avenue West towards the southern end of the western platform and Gunns Road towards the northern end of the western platform. In addition, improvement initiatives for pedestrian and cycling infrastructure and station access have been included in the station's IPD, e.g., improvements along St. Clair Avenue West and Union Street. The initiatives included in the St. Clair Avenue West TMP will further enhance these improvements. However, due to the significant anticipated increase in pedestrian and cycling activities, it is predicted that there will be operational

concerns within the study area. Mitigation measures to address these concerns are presented in Section 4.9.2.

One location where there is circulation within the station site is the bus loop located on Union Street on the east side of the rail corridor. It is recommended that the direction of travel within the bus loop be counter-clockwise. This will facilitate safe and easy transfers for local transit riders accessing the station: the doors on TTC buses are on the right side of the vehicle, so having the bus stop facing southbound allows the doors to open towards the station, allowing passengers to board/alight and walk directly into the station, as opposed to having to cross the street within the bus loop.

No conflicts are expected between buses using the loop and pedestrians walking along the west side of Union Street. The north station entrance is north of the bus loop, and the south station entrance is south of the bus loop; pedestrians from the north and south will therefore be able to access the north and south station entrances, respectively, without having to cross the street where the bus loop entrance and exit are located.

4.9.2 Potential Effects, Mitigation and Monitoring Measures

The minimal number of auto trips generated by the informal PPUDO (102 in the A.M. peak hour and 85 in the P.M. peak hour estimated conservatively) are not expected to have significant effects on the existing transportation network relative to other nearby developments. This number of auto trips satisfactorily meets the trip threshold as per the City's TIS guidelines (the number of trips in the A.M. peak hour is slightly over 100, but it has been concluded that this is acceptable given the conservative nature of the analysis);

Mitigation measures are recommended to support development around the station site regarding pedestrian and cycling connectivity, flow and movement, as additional means to mitigate the anticipated increase in pedestrian and cyclist activities. These initiatives are outlined in Table 4-17.

Other items to be considered are as follows:

- It is recommended that the bus loop travel in a counter-clockwise direction, to facilitate safe and easy transfers for local transit riders accessing the station;
- It is recommended that the intersection of Union Street at Turnberry Avenue be signalized, if the Gunns Road extension is constructed, to ensure safety for all road users accessing the south station entrance; and
- It is recommended that the intersection of the Keele Street extension and Gunns Road extension be signalized (if these extensions are constructed) to ensure safety for all road users accessing the station.
- It is recommended that further study into improving the pedestrian and cyclist operations at the intersection of Union Street and Townsley Street or a pedestrian crossing signal north of Townsley Street in particular be conducted, where the pedestrian/cyclist activities are expected to be the most significant: e.g., wide crosswalk, modifications to pedestrian/cyclist signal timing, pedestrian/cyclist overpass/underpass, etc.
- It is recommended that local transit service in the study area be reviewed, such as increasing transit frequency and capacity, as well as the re-routing of existing routes to

utilize the new bus loop and the implementation of new bus routes, to address the anticipated increase in local transit demand for trips to/from the station.

- It is recommended that opportunities for future bicycle parking, specifically at the northern access west of the rail corridor (off Gunns Road extension) will be provided.

Further details on potential effects, mitigation and monitoring are provided in Appendix I of this Volume.

Table 4-17 Transportation Environment - Potential Effects, Mitigation and Monitoring

Feature	Potential Effect	Mitigation Measure	Monitoring
Operations			
Traffic	Increased pedestrian/cyclist flow along sidewalk/roadways adjacent to the station and at key intersections.	• Signalize the Union Street and Townsley Street intersection, including the implementation of pavement markings for crossings, to accommodate the significant increase in pedestrian/cyclist volumes and ensure safety for all road users; or keep this intersection as stop-controlled intersection (one way or three way) with pedestrian crossing signal being added north of Townsley; • Install sidewalks on both the north and south sides of Townsley Street between Union Street and Old Weston Road; • Install a sidewalk on the west side of Union Street between the northern limit of the currently proposed multi-use path and Turnberry Avenue; • Implement pavement markings for crossings on the north and east legs of the intersection of Union Street and Turnberry Avenue; • Provide highest standard of pedestrian safety in design of sidewalks and intersections, including appropriate curb radii designed according to City Curb Radii Design Guidelines, and other pedestrian safety features where appropriate. • Install two bike shelters on the west side of the rail corridor; one at the north end of the platform and one at the south end of the platform, to facilitate access for cyclists to/from the west. • Ensure station entrance facilities meet the requirements of the *Accessibility for Ontarians with Disabilities Act, 2005* (AODA), to the extent possible.	• Following construction of the new station and local improvements, monitor pedestrian and cyclist activity to determine if additional mitigation measures are required.
Construction			
Construction Effects	Road closure or reduced lanes during construction will temporarily impede traffic flow in the vicinity of the station.	• A Construction Traffic Management Plan will be developed prior to construction which will include providing pedestrian and cyclist access through work zones, alerting local transit of potential travel delays/service disruptions in advance of Project construction including road closures; and identification of best detour routes for transit vehicles that minimizes travel time and service disruptions.	Monitor the effectiveness of the traffic management/control strategies and adjust as necessary during the construction period.

5. Permits, Approvals and Commitments to Future Work

5.1 Permits and Approvals

5.1.1 Federal

5.1.1.1 Canadian Environmental Assessment Act, 2012

Under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), the Regulations Designating Physical Activities identify the types of projects that may require a Federal EA. The Project does not constitute a designated project under CEAA 2012.

5.1.1.2 Species at Risk Act

The federal *Species at Risk Act*, 2002 (SARA 2002) provides a framework to ensure the survival of wildlife species and the protection of natural heritage in Canada. Under SARA, the federal government has responsibility for wildlife on federal lands. On private lands, SARA protection applies to: aquatic species listed as endangered, threatened or extirpated in Schedule 1 of SARA; migratory birds protected under the MBCA; and species in certain cases where provincial/territorial measures do not adequately protect a species;

No federal lands, aquatic species or migratory birds protected under the MBCA are anticipated to be impacted by the Project, and as such no permits are required under SARA.

5.1.1.3 Fisheries Act

As there are no anticipated effects on the watercourse within the study area, a Federal *Fisheries Act* Authorization is not required.

5.1.2 Provincial

5.1.2.1 Conservation Authorities Act

The study area is not regulated by the TRCA under Ontario Regulation 166/06 - Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. Therefore, no further work is required with respect to the Conservation Authorities Act.

5.1.2.2 Endangered Species Act, 2007

The *ESA* provides specific protection to Endangered and Threatened species and their habitat. Two Threatened SAR were identified as potentially occurring in the study area: Barn Swallow, and Chimney Swift.

No Barn Swallows were observed during site investigations but there is moderate potential for the species to nest in the area, particularly beneath the railway bridge. The rail bridge is planned for removal and replacement as part of the IPD. Prior to Project commencement, the Project area (i.e. bridge deck) should be inspected for Barn Swallow nests to ensure none exist. If nests are discovered, the Project must register the activity with the MNRF as part of ESA O. Reg. 242/08 prior to commencement of work. Installation of compensation habitat will likely be required, such as a nesting “kiosk”. Barn Swallows reuse nests from year to year, and their nests are protected year-round under the ESA.

No Chimney Swifts or their nests were identified during presence/absence surveys conducted on June 19, 2018; however, they may still be encountered incidentally within the study area and/or they may nest in the area between the finalization of this report and commencement of

construction. Therefore, targeted roost surveys for Chimney Swift should be completed in appropriate chimneys if buildings (with chimneys) are proposed for removal within the study area prior to commencement of demolition activities. Repair, maintenance, or demolition of Chimney Swift roost/nesting structure may constitute destruction of critical habitat and the Project must register the activity with the MNRF as part of O. Reg. 242/08 under the ESA.

There are no requirements for Peregrine Falcon or Common Nighthawk under the ESA as they are Special Concern species and no effects to their habitat (e.g., nesting habitat) are anticipated.

5.1.2.3 Environmental Protection Act

Dewatering during construction may be required to facilitate creation of an isolated dry work area and may require registration on the Environmental Approval Sector Registry (EASR) system (if dewatering is over 50,000 L/day but under 400,000 L/day) or a Permit to Take Water (if dewatering exceeds 400,000 L/day).To improve air quality around the station during operation and maintenance, MOECC EASR recommendations for exempt equipment (O. Reg. 524/98) that has minimal air quality impacts, as well as application to the EASR for equipment that qualifies (O. Reg. 1/17 and O. Reg. 419/05) will be adhered to.

5.1.2.4 Ontario Water Resources Act

A Permit to Take Water may be required if dewatering during construction exceeds 400,000 L/day).

Approvals for discharge of pumped water will be required, which could include one or a combination of MOECC Environmental Compliance Approval (ECA) (under the *Ontario Water Resources Act* (OWRA), Section 53)), Municipal Discharge Permits, and/or Conservation Authority Approval (through the Voluntary Project Review process). The need for these permits will be determined during detailed design.

5.1.3 Municipal

Metrolinx, as a Provincial Crown Agency, is not generally subject to municipal permitting and approval requirements; regardless, Metrolinx works in co-operation with local municipalities to adhere to the intent of the relevant permit/approval requirements to the extent possible. Metrolinx is in the process of establishing a Vegetation Compensation Protocol for RER projects; vegetation that is removed for the Project will be compensated for in accordance with the provisions of this protocol.

Removal and/or damage of woody vegetation located in adjacent lands, beyond the Kitchener rail corridor, may require municipal tree removal permits. To support the permit applications, an Arborist Report will be completed during detailed design to supplement the Tree Inventory Plan. Metrolinx will work in co-operation with the City of Toronto in the spirit of meeting by-law requirements, specifically the Private Tree By-law and Trees on City Streets By-law.

Municipal Discharge Permits may also be required for the discharge of pumped water associated with construction dewatering activities.

Construction should adhere to the City of Toronto noise by-laws (Noise Control By-Law, Municipal Code Chapter 591, By-law 1400-2007), to the extent possible. It is recommended that the vibration limits in the City of Toronto bylaw not be exceeded. This may entail

monitoring of vibration levels during construction. Anticipated vibration levels will be confirmed during detailed design.

5.2 Commitments to Future Work

Metrolinx is committed to implementing the mitigation measures and monitoring activities outlined in Section 4. Permits, approvals and commitments to future work to be completed during the detailed design, as well as during pre-construction and construction, are outlined in Table 5-1.

Table 5-1: Commitments to Future Work

Discipline	Commitments
Detailed Design	
General	• Mitigation measures and monitoring requirements documented in Section 4 of this Volume of the EPR related to detailed design will be implemented. • Metrolinx will consult with Hydro One during detail design. Design drawings will be provided for review. • Metrolinx will ensure that CP is notified in advance of any potential service disruptions and consult with CP Rail to establish a suitable mitigation strategy to be implemented.
Natural Environment	• Metrolinx, as a Provincial Crown Agency, is not generally subject to municipal permitting and approval requirements; regardless, Metrolinx works in co-operation with local municipalities to adhere to the intent of the relevant permit/approval requirements to the extent possible. Metrolinx is in the process of establishing a Vegetation Compensation Protocol for RER projects; vegetation that is removed for the Project will be compensated for in accordance with the provisions of this protocol. • Efforts will be made to coordinate with Toronto Hydro, Toronto Water and other utility companies that may be affected by utility relocations to help minimize the overall impacts of the Project on the natural heritage system. • Infrastructure and utility works will either be completed by Metrolinx as part of this Project, or by utility companies. Metrolinx and its Contractors will follow TRCA regulatory requirements. • A Soil Management Plan will be developed by a Qualified Professional as defined in O. Reg. 153/04 for managing soil materials on-site (includes excavation, location of stockpiles, reuse and off-site disposal). • A Stormwater Management Report will be completed to determine potential effects and mitigation measures. The report will be completed in consultation with TRCA and the MOECC. Stormwater management design will consider guidance provided by the MOECC Stormwater Management Planning and Design Manual (2003), Ministry of Transportation Ontario (MTO) Drainage Management Manual (2008), TRCA Storm Water Management Criteria (2012), and the Low Impact Development Stormwater Management Planning and Design Guide (TRCA/Credit Valley Conservation, 2010). • No in-water works are anticipated at this time; in the event in-water works are identified to be required during detailed design, the project team will consult with TRCA, MNRF and DFO to identify restricted activity timing windows. • Measures to mitigate a potential loss of green space and reduce storm runoff will be identified in detailed design. • Flood Contingency Plan will be developed to identify the need for flood contingency measures where flood plain areas exist.
Geology and Groundwater	• Hydrogeological and geo-environmental studies will be carried out, which may identify recommendations for groundwater mitigation measures and monitoring. These future studies will be circulated to TRCA for review. • TRCA Geotechnical Engineering Design and Submission Requirements guidelines will be referenced during detail design phase. • Soil and bedrock conditions, as well as bedrock elevations, will be confirmed through future geotechnical investigations to be undertaken in support of detailed design. • Ongoing engagement with the CTC source protection authority will be maintained.
Trees	• Removal and/or damage of woody vegetation located in adjacent lands, beyond the Kitchener rail corridor, may require municipal tree removal permits. To support the permit applications, an Arborist Report will be completed during detailed design to supplement the Tree Inventory Plan. Metrolinx will work in co operation with the City of Toronto in the spirit of meeting by-law requirements, specifically the Private Tree By-law and Trees on City Streets By-law.

Discipline	Commitments
	• An update of the tree removal count of the Project will be undertaken. This should be based upon a more detailed level of design, with available access permissions and more detailed survey information, to the extent possible. • An update of the tree inventory to account for detailed grading, work zones and proposed clearing, to illustrate TPZ and their protection measures (types and locations), and tree removal zones, in accordance with the completion of an Arborist Report. The Arborist Report will be completed during detailed design and will contain at a minimum the following information in addition to details of tree location, size, species, conditions and category: 1. Recommendations for tree/vegetation protection and preservation measures for all trees/vegetation that are to be retained; 2. Details of tree pruning; 3. Details of all trees/vegetation recommended for removal, including removal measures; 4. Appraised values of trees/vegetation to be removed; 5. Mitigation and monitoring measures recommended to ensure success of preservation and removal measures; 6. Should vegetation compensation be required, it will be in accordance with the Metrolinx Vegetation Compensation Protocol; and 7. Mapping. • Assessment of trees within or adjacent to the work zones will be completed, as defined by the detailed design, as part of an Arborist Report to determine if trees will be affected. • Preparation of detailed tree removal, restoration, and compensation plans will be undertaken in coordination with a Certified Arborist and/or Landscape Architect (licensed to practice in the Province of Ontario) to assist with species selection, planting locations and measures to promote establishment success.

Built Heritage Resources and Cultural Heritage Landscapes	• Recommendations for BHRs and CHLs are based on the CHSR, CHAR, and CHERs undertaken for this Project. The following mitigation measures will be undertaken:
	  • Heritage Impact Assessments must be completed for SW-1 - the St. Clair Avenue West Subway.
	• The following mitigation measures will be implemented for SW-3 - 1900 St. Clair Avenue West:
	  • Pre-construction consultations between the applicant and owners/occupants;
	  • Pre-construction measurements of background vibration levels;
	  • Pre-condition survey by means of a photographic record of potentially affected structure façades and all surfaces, including visible sections of building foundations, building cladding, doors, windows, interior wall finishes, surface pavement, sidewalks, signs and trees. Each of the elements should be rated on their general condition (new, good, fair, poor, severe), and visible defects will be photographed.
	  • Any additional measures outlined in the Noise and Vibration Control Plan should be implemented for the properties of known and potential CHVI that fall within the ZOI.
	  • A CHER and, if required, HIA will be prepared during Detailed Design, to assess additional potential impacts related to the design of the station, for the ABC Lumber property at 153 Weston Road SW-9, within which the Project footprint is located.
	  • If during detailed design the final limits of the St. Clair-Old Weston Station are altered and fall outside the Project footprint, further assessment may be necessary.

Discipline	Commitments

	• Metrolinx will:
	  • Complete CHERs, where recommended, as early as possible during the detailed design phase of the Project and prior to completion of detailed design.
	  • Complete HIAs, where required, in accordance with the Standards and Guidelines for Conservation of Provincial Heritage Properties and as early as possible during the detailed design phase and prior to completion of detailed design. The HIA will discuss the alternatives considered, and that all other alternatives to removal and/or demolition have been considered and the best alternative has been adopted. The HIA will also make recommendations to minimize or mitigate adverse effects on the property.

Archaeology	• Archaeological recommendations are based on a Stage 1 AA undertaken for this Project. Archaeological recommendations have been made based on the background historic research, locations of known or registered archaeological sites, previous AAs, and indicators of archaeological potential as outlined in the 2011 S&G. These recommendations are:
	  • Areas determined to be undisturbed will be subjected to a Stage 2 AA Test Pit Survey at 5-meter intervals in accordance with section 2.1.2 of the 2011 S&G prior to construction activities to ensure no cultural heritage resources will be impacted;
	  • Areas determined to be disturbed do not require further assessment; and,
	  • If final limits of the St. Clair-Old Weston Project are altered and fall outside the current study area, an additional Stage 1 AA is required to assess the new footprint.
	• Figure 3-7, in Section 3.4.2 of this EPR Volume, indicates areas of archaeological potential requiring Stage 2 AA. Metrolinx will:
	  • Complete all required AA (Stage 2 and Stage 3 if recommended by the Stage 2AA) as early as possible, prior to the completion of detail design, and well in advance of any ground disturbance;
	  • Undertake future work in a manner that protects archaeological sites by conserving them in their original location or through archaeological fieldwork, and endeavour to conserve significant archaeological resources in their original location through documentation, protection, and avoidance of impacts. Where activities could disturb significant archaeological resources or areas of archaeological potential, Metrolinx will take appropriate measures to mitigate impacts; and
	• Include provisions in contract as recommended by archaeological assessment(s) (e.g. in case archaeological resources are discovered, protection of sites).

Socio-Economic and Land Use Characteristics	• Confirm effects on utilities. Additional SUE investigations may be conducted, as required, to confirm existing utilities. A review of existing and proposed future utilities plans, in addition to on-going consultation with utility companies and the City of Toronto, will be conducted during the detailed design stage. • Any relocations, service interruptions, or utility protection projects will be identified as early as possible to allow for project coordination and construction management plans to be created with consideration of utility needs. • Specific property requirements will be determined during detailed design. Ongoing consultation with affected property owners will help identify appropriate site-specific mitigation measures. Where access to property is required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures. • A lighting plan will be developed where the quality of light produced, and type of light sources used on the exterior of buildings, signs, pedestrian walkways, and other areas of the site, are compatible with, and appropriate to the overall design and use of the site.

Discipline	Commitments
	• Metrolinx will work with Hydro One during detailed design to avoid impacts and/or develop mitigation. • Metrolinx will continue to work with CP through detailed design to minimize potential effects on CP operations.
Air Quality	• To improve air quality around the station during maintenance and operation, MOECC EASR recommendations for exempt equipment (O. Reg. 524/98) that has minimal air quality impacts, as well as application to the EASR for equipment that qualifies (O. Reg. 1/17 and O. Reg. 419/05) will be adhered to during detailed design.

Noise and Vibration	• A more detailed noise assessment of construction will be completed when the specifics of construction equipment are finalized, prior to construction start. This assessment will consider minimizing construction-related noise levels, while balancing construction schedules and expediting construction activity.
	• During detailed design, the station public address system, ancillary systems, and any other stationary noise sources will be designed so that the one-hour equivalent sound level does not exceed the higher of the applicable exclusion limit value given in NPC-300, or the background sound level.
	• A more detailed vibration assessment of construction will be completed when the specifics of construction equipment are finalized, prior to construction start. This assessment will consider minimizing construction-related vibration levels, while balancing construction schedules and expediting construction activity.
	• A vibration monitoring plan will be completed during detailed design.
	• During detailed design, the predicted ZOI will be updated to confirm which structures fall within it. If a structure falls within the updated ZOI, the following is recommended:
	  • Pre-construction consultations with owners/occupants;
	  • Pre-construction measurements of background vibration levels; and
	  • Pre-construction survey by means of a photographic record of potentially affected structure façades and all surfaces, including visible sections of building foundations, building cladding, doors, windows, interior wall finishes, surface pavement, sidewalks, signs and trees. Each of the elements will be rated on their general condition (new, good, fair, poor, severe), and visible defects should be photographed.

Traffic and Transportation	• City of Toronto staff will be requested to include, in their 2-year review of the Ten-Year Cycling Network Plan scheduled in 2018, a review of the cycling infrastructure and routes in the vicinity of the Project in order to identify possible improvements to the cycling network (both on-street and on trails) to enhance convenience and safety for cyclists accessing this station.
Construction[11]	
General	• Mitigation measures and monitoring requirements documented in Section 4 of this Volume of the EPR related to construction will be implemented. • An Environmental Mitigation and Monitoring Plan (EMMP) will be developed prior to construction to outline the responsibilities for carrying out monitoring and reporting activities, including timing and frequency of monitoring activities, as well as the compliance process. The EMMP will include all mitigation measures, categorized by Project phase, and will identify the party responsible for implementation.
Natural Environment	• An ESC Plan prior to construction for implementation throughout construction will be developed. The ESC Plan will include consideration of the Greater Golden Horseshoe Area Conservation Authorities' Erosion and Sediment Control Guideline for

[11] Construction phase commitments include pre-construction commitments, completed following detailed design but prior to ground disturbance.

Discipline	Commitments
	Urban Construction and OPSS 805 (Erosion and Sediment Control Measures, Ministry of Transportation, 2015). This plan will encompass all areas of soils disturbance, particularly in the vicinity of the Lavender Creek.
Geology and Groundwater	• Dewatering during construction may be required to facilitate creation of an isolated dry work area and may require registration on the Environmental Approval Sector Registry (EASR) system (if dewatering is over 50,000 L/day but under 400,000 L/day) or a Permit to Take Water (if dewatering exceeds 400,000 L/day). • Approvals for discharge of pumped water will be required, which could include one or a combination of MOECC ECA (under the *Ontario Water Resources Act* (OWRA), Section 53)), Municipal Discharge Permits, and/or Conservation Authority Approval (through the Voluntary Project Review process). The need for these permits will be determined during detailed design. • Municipal Discharge Permits may also be required for the discharge of pumped water associated with construction dewatering activities.
Archaeology	• Should deeply buried archaeological materials be encountered during construction, all work will cease and a professionally licenced archaeologist will be consulted to assess the cultural heritage value and significance of the archaeological deposits; • Areas identified to contain deeply buried archaeological potential will be subjected to a Stage 2 AA in accordance with Section 2.1.7, Standard 3 of the 2011 S&G, prior to construction activities. Trenches should be excavated at a maximum 10 m intervals to obtain clear sedimentary profiles to assess deeply buried potential. Trench placement should be determined to be an effective response to the detailed design of the Project (Figure 3-7); • Areas identified to contain deeply buried archaeological potential without key defining historical elements (i.e., structures) must be subjected to Stage 2 AA construction monitoring in accordance with Section 2.1.7 Standard 4 (Figure 3-7); • MTCS will be notified if archaeological resources are encountered or impacted during the course of the EA project work. All activities impacting archaeological resources will cease immediately, and a licensed archaeologist will carry out an archaeological assessment in accordance with the OHA and the Standards and Guidelines for Consultant Archaeologists. • If human remains are encountered during project work, all activities will cease immediately and the local police as well as the Cemeteries Regulation Unit of the Ministry of Government and Consumer Services will be contacted. In situations where human remains are associated with archaeological resources, MTCS will also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the OHA. • No construction activities will take place within the study area prior to the MTCS confirming in writing that all archaeological requirements have been met.
Socio-Economic and Land Use Characteristics	• Site-Specific Construction Traffic Control and Management Plans will be prepared and implemented prior to Project construction to maintain reasonable access through work zones, to the extent possible.
Air Quality	• An Air Quality Management Plan will be developed for implementation during construction to address construction equipment and vehicle exhaust, fugitive dust and odour.
Noise and Vibration	• Construction should adhere to the City of Toronto noise by-laws (Noise Control By-Law, Municipal Code Chapter 591, By-law 1400-2007), to the extent possible. It is recommended that the vibration limits in the City of Toronto bylaw not be exceeded. This may entail monitoring of vibration levels during construction. Anticipated vibration levels will be confirmed during detailed design. • A Noise and Vibration Control Plan will be developed prior to construction. The plan will include a complaint response protocol and will indicate that surrounding property owners and tenants will be informed of anticipated upcoming construction

Discipline	Commitments
	works, including any work at night.
Traffic and Transportation	• A Construction Traffic Management Plan (CTMP) will be developed prior to construction which will include providing pedestrian and cyclist access through work zones, alerting local transit of potential travel delays/service disruptions in advance of Project construction including road closures; identification of best detour routes for transit vehicles that minimizes travel time and service disruptions should be identified.
Operations and Maintenance	
General	• Mitigation measures and monitoring requirements documented in Section 4 of this Volume of the EPR related to operations will be implemented.

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