METROLINX

GO Rail Network Electrification Final Environmental Project Report Addendum

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MORRISON HERSHFIELD

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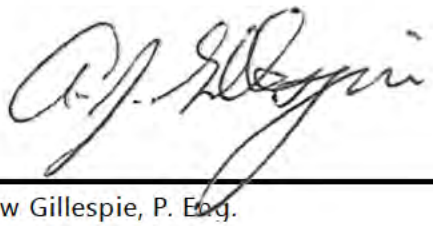
X 

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REVISION HISTORY

Revision No.	Date	Purpose of Submittal	Comments
00	2021-02-16	Final Submission to Metrolinx	N/A
01	2021-05-17	Revised Final Submission to Metrolinx	N/A

This submission was completed and reviewed in accordance with the Quality Assurance Process for this Project.

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Acronyms, Abbreviations, and Measurement Units

Term	Definition
AA	Archaeological Assessment.
AC	Alternating Current.
AG	Ecological Land Classification for Agriculture.
ANSI	Areas of Natural and Scientific Interest.
AODA	*Accessibility for Ontarians with Disabilities Act.*
APEC	Area of Potential Environmental Concern.
APTA	American Public Transportation Association.
AQ	Air Quality.
AQMP	Air Quality Management Plan.
ARA	Archaeological Research Associates.
AREMA	American Railway Engineering and Maintenance-of-Way Association. AREMA is the organization that represents the engineering function of the North American railroads.
ASI	Archaeological Services Inc.
ASL	Above Sea Level
ATRIS	Aboriginal and Treaty Rights Information System.
BHR	Built Heritage Resource.
BP	Before present.
BR	Barrie Rail Corridor.
BRCE	Barrie Rail Corridor Expansion.
CA	Conservation Authority.
Cadna/A	Noise propagation model.
CanNor	Canadian Northern Railway.
CE	Common Era.
CEAA	*Canadian Environmental Assessment Act.*
CENELEC	Comité Européen de Normalisation Électrotechnique CSA.
CFIA	Canadian Food Inspection Agency.

Term	Definition
CGL	Ecological Land Classification for Green Lands.
CH	Conservation Halton.
CHR	Cultural Heritage Report.
CHER	Cultural Heritage Evaluation Report.
CHL	Cultural Heritage Landscape.
CHSR	Cultural Heritage Screening Report.
CHVI	Cultural Heritage Value or Interest.
CLOCA	Central Lake Ontario Conservation.
CN	Canadian National Railway.
CNR	Canadian National Railway.
COS	Contamination Overview Study.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada.
COSSARO	Committee on the Status of Species at Risk in Ontario.
CP	Canadian Pacific Railway.
CPR	Canadian Pacific Railway.
CRA	Commercial, Recreational or Aboriginal (used in the context of describing fisheries).
CSA	Canadian Standards Association.
CSP	Corrugated Steel Pipe.
CTA	Canadian Transportation Agency.
CUM	Ecological Land Classification for Cultural Meadow.
CUP	Ecological Land Classification for Cultural Plantation.
CUT	Ecological Land Classification for Cultural Thicket.
CUW	Ecological Land Classification for Cultural Woodland.
CV	Ecological Land Classification for Constructed Lands.
CVC	Ecological Land Classification for Shallow Marsh.
CVC Authority	Credit Valley Conservation Authority.
CVI	Ecological Land Classification for Transportation and Utilities.
CVR	Ecological Land Classification for Residential Lands.
CWR	Continuous Welded Rail.

Term	Definition
DBFOM Model	Design – Build – Finance – Operate – Maintain Model.
DBH	Diameter at Breast Height.
Decibel (dB)	A-weighted decibels, abbreviated dBA, or dBa, or dB (a), are an expression of the relative loudness of sounds in air as perceived by the human ear.
DFO	Department of Fisheries and Oceans. This agency has since been renamed Fisheries and Oceans Canada but continues to use DFO as an acronym.
DL	Distribution Line.
DMU	Diesel Multiple Unit.
DRM	Design Requirements Manual.
DSF	Double Stacked Freight.
EA	Environmental Assessment.
EA Act	*Environmental Assessment Act.*
EASR	*Environmental Activity Sector Registry*.
ECCC	Environment and Climate Change Canada.
ELC	Ecological Land Classification.
ELF	Extremely Low Frequency.
EMC	Electromagnetic Compatibility.
EMF	Electric and Magnetic Field.
EMI	Electromagnetic Interference.
EMMP	Environmental Mitigation and Management Plan.
EMU	Electric Multiple Unit.
EN	European Norms/Standards.
END	Designation of "Endangered" for a Species at Risk under Ontario's *Endangered Species Act, 2007.*
EPB	Electrical Protection Barriers.
EPR	Environmental Project Report.
EPS	Electrification Performance Specifications.
ERIS	Environmental Risk Information Systems.
ESA	Environmentally Significant Area.
ESA, 2007	The *Ontario Endangered Species Act, 2007.*
ESAs	Environmental Site Assessments.

Term	Definition
ESC	Erosion and Sediment Control.
ESR	Environmental Study Report.
FCC	Federal Communications Commission.
FOD	The Ecological Land Classification for Deciduous Forest Community.
FOM	The Ecological Land Classification for Mixed Forest.
FRA	Federal Rail Administration (US Department of Transportation).
FTA	Federal Transit Administration (US Department of Transportation).
FWCA	*Fish and Wildlife Conservation Act*.
GHG	Greenhouse Gas.
GIS	Geographic Information System.
GMP	Groundwater Management Plan.
GPS	Global Positioning System.
GRT	Government Review Team.
GS	Grade Separation.
GSC	Geological Survey of Canada.
GTR	Grand Trunk Railway.
GTTA	Greater Toronto Transportation Authority.
HCM	Highway Capacity Manual.
HDF	Headwater Drainage Feature.
HIA	Heritage Impact Assessment.
HONI	Hydro One Networks Incorporated.
HV	High Voltages.
HWIN	Hazardous Waste Information Network.
IAA	*Impact Assessment Act.*
ICS	Infrastructure Configuration State.
IEC	International Electrotechnical Commission.
IEEE	Institute of Electrical and Electronics Engineers.
IO	Infrastructure Ontario
IPCC	The Intergovernmental Panel on Climate Change.

Term	Definition
IPZ	Intake Protection Zone.
JCT	Junction
Km	Kilometre.
KT	Kitchener Rail Corridor.
kV	Abbreviation for kilovolt (equal to 1000 volts).
LEED	Leadership in Energy and Environmental Design.
L_{EQ}	Equivalent Sound Level.
LID	Low Impact Development.
LIO	Land Information Ontario.
LPAT	Local Planning Appeal Tribunal.
LSE	Lakeshore East Rail Corridor.
LSRCA	Lake Simcoe Region Conservation Authority.
LSW	Lakeshore West Rail Corridor.
LV	Low Voltages.
m	Metres.
MA	Ecological Land Classification for Marsh.
MAM	Ecological Land Classification for Meadow Marsh.
MAS	Ecological Land Classification for Shallow Marsh.
MBCA	*Federal Migratory Birds Convention Act, 1994.*
mbgs	Metres below ground surface.
MECP	The acronym for Ontario Ministry of the Environment, Conservation, and Parks, formerly referred to as the Ministry of the Environment and Climate Change (MOECC), Ministry of the Environment and Energy (MOEE) or just Ministry of the Environment (MOE).
Megavolt-Ampere (MVA)	This is a unit for measuring the apparent power in an electrical circuit equivalent of one million watts.
MEM	Ecological Land Classification for Mixed Meadow.
MHSTCI	Ontario Ministry of Heritage, Sport, Tourism and Culture Industries (formerly the Ontario Ministry of Tourism, Culture and Sport [MTCS]). The governing body that enforces Part IV and V of the *Ontario Heritage Act* and may determine policies, priorities and programs for the conservation, protection and preservation of Ontario's heritage.
Milligauss	In electricity, a practical unit of magnetic induction equal to a thousandth of one gauss or of one c. g. s. electromagnetic unit.

Term	Definition
MIRR	Ministry of Indigenous Relations and Reconciliation.
MMAH	Ministry of Municipal Affairs and Housing.
MNO	Metis Nation of Ontario.
MNRF	Ontario Ministry of Natural Resources and Forestry.
MOEE/GO Protocol	MOEE/GO Transit Protocol for Noise and Vibration Assessment (1995).
MOL	Ministry of Labour.
MOW	Maintenance of Way.
MTO	Ontario Ministry of Transportation.
MVA	Megavolt-Ampere.
MVC	Minimum Vertical Clearance.
NAPS	National Air Pollution Surveillance
NAR	Designation of Not-at-Risk species.
NDA	New Directions Archaeology.
NHIC	Natural Heritage Information Centre.
NIEHS	National Institute of Environmental Health Sciences, a division of the United States National Institute of Health (NIH).
NEP	The acronym for Niagara Escarpment Plan areas, part of the Greenbelt Plan.
O.Reg	Ontario Regulation.
OA	Ecological Land Classification for Open Water.
OASD	Ontario Archaeological Sites Database.
OBA	Ontario Butterfly Atlas.
OCS	Overhead Contact System.
OGS	Ontario Geological Survey.
OHA	*Ontario Heritage Act*.
OHT	Ontario Heritage Trust.
OnCorr	On-Corridor
OP	Official Plan.
OPSS	Ontario Provincial Standard Specification.
OTM	Ontario Traffic Manual.

Term	Definition
OWRA	*Ontario Water Resources Act*, R.S.O. 1990, c. O.40.
PCA	Potentially Contaminating Activity.
PM	Progressive Maintenance.
PS	Paralleling Station.
PSW	Provincially Significant Wetland.
PTE	Permission to Enter.
PTTW	Permission to Take Water.
RCD	Reference Concept Design.
RER	Regional Express Rail.
RF	Radiofrequency.
RH	Richmond Hill Rail Corridor.
RNFP	Ravine and Natural Feature Protection.
RoC	Record of Consultation.
ROM	Royal Ontario Museum.
ROW	Right-of-Way.
RRFMP	Rouge River Fisheries Management Plan.
RTP	Regional Transportation Plan 2041.
S & G	Standards and Guidelines for Consultant Archaeologists.
S1	Committee on the Status of Species at Risk in Ontario designation for Critically Imperiled — meaning a critically imperiled species in the 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 province.
S2	Committee on the Status of Species at Risk in Ontario designation for Imperiled — meaning an imperiled species in the 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 province.
S3	Committee on the Status of Species at Risk in Ontario designation for Vulnerable — meaning a vulnerable species in the 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.
SAR	Species at Risk.
SARA	*Species at Risk Act, 2002.*
SARO	Species at Risk in Ontario.

Term	Definition
SC	Designation of "Special Concern" for a Species at Risk under Ontario's *Endangered Species Act, 2007*.
SCADA	The acronym for Supervisory Control And Data Acquisition. SCADA is a control and monitoring system that controls, monitors and collect status of the systems and devices for the electrification system. These devices may include motor operated disconnect switch, relay, meter and circuit breaker, transformer, of the Electrification System.
SEMMP	Soil and Excavation Materials Management Plan
SHO	Ecological Land Classification acronym for Open Shoreline.
SOCC	Species of Conservation Concern.
SPA	Source Protection Area.
SPP	Source Protection Plan.
ST	Stouffville Rail Corridor.
STEAM	Sound from Trains Environmental Analysis Method.
SUE	Subsurface Utility Engineering.
SW	Ecological Land Classification for Swamp.
SWD	Ecological Land Classification for Deciduous Swamp.
SWH	Significant Wildlife Habitat.
SWM	Stormwater Management.
SWS	Switching Station.
SWT	Ecological Land Classification for Swamp Thicket.
TAC	Technical Advisory Committee.
TAG	Ecological Land Classification acronym for Treed Agriculture.
TC	Transport Canada.
TDSB	Toronto District School Board.
THD	Ecological Land Classification acronym for Deciduous Thicket.
The Project	GO Rail Network Electrification.
THR	The acronym for the designation of Threatened for a Species at Risk.
TIA	Traffic Impact Assessment.
TMC	Turning Movement Counts.
TPAP	Transit Project Assessment Process.
TPF	Traction Power Facility.
TPZ	Tree Protection Zone.

Term	Definition
TRCA	Toronto and Region Conservation Authority.
TSS	Total Suspended Solids
TSS1	Train Service Scenario.
TTS	Transportation Tomorrow Survey.
UP Express	Union-Pearson Express.
UPS	Uninterrupted Power Supply.
USRC	Union Station Rail Corridor.
VOC	Volatile Organic Compound.
WHMIS	Workplace Hazardous Material Information System.
WHPA	Wellhead Protection Area.
WOD	Ecological Land Classification for Deciduous Woodland.

Glossary of Terms

Term	Definition
2041 Regional Transportation Plan (RTP) (2018)	The 2041 RTP is the second transportation plan for the GTHA developed by Metrolinx. The 2041 RTP outlines how governments and transit agencies will work together to build an integrated transportation system that will allow people to travel quickly and seamlessly to more places.
Accessibility for Ontarians with Disabilities Act (AODA) (2005)	The *Accessibility for Ontarians with Disabilities Act*, 2005 (AODA) is a statute enacted in 2005 by the Legislative Assembly of Ontario, Canada. Its purpose is to improve accessibility standards for Ontarians with physical and mental disabilities to all public establishments by 2025.
Adjusted Noise Impact	The Adjusted Noise Impact is based on the difference between the objective and Post-project noise (i.e., including ambient sound and sound from Post-project rail). In the context of the noise assessments completed for this project, the Post-project noise is the future scenario with the implementation of new rail infrastructure and Ultimate Capacity traffic volumes.
Alternating Current (AC)	An electric current in which the flow of electric charge periodically reverses direction, whereas in direct current (DC, also dc), the flow of electric charge is only in one direction.
Alternative Financing and Procurement (AFP)	An AFP model brings together private and public sector expertise in a unique structure that transfers the risk of project cost increases and scheduling delays typically associated with traditional project delivery.
Ambient Sound Levels	Sound existing at a receptor in the absence of all noise from GO Rail Network. Includes noise from road traffic and existing industry.
Area of Natural and Scientific Interest (ANSI)	An area of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study, or education.
Area of Potential Environmental Concern (APEC)	An area within the Study Area where one or more contaminants are potentially present, as determined through the Contamination Overview Study including identification of past or present land uses of concern and/or identification of a Potentially Contaminating Activity (PCA).
Autotransformer	Apparatus which helps boost the overhead contact system (OCS) voltage and reduce the running rail return current in the 2 X 25 kV autotransformer feed configuration. It is a single winding transformer having three terminals. The intermediate terminal located at the midpoint of the winding is connected to the rail and the static wires, and the other two terminals are connected to the catenary and the negative feeder wires, respectively.
Autotransformer Return Feeder	An overhead conductor supported on the same structure as the catenary conductors. The Autotransformer Return Feeder connects successive feeding points and is connected to one terminal of an autotransformer in the TPF via a circuit breaker or disconnect switch. At these facilities, the other terminal of the autotransformer is connected to a catenary section or sections via circuit breakers or disconnects.

Term	Definition
Best Practices	Professional procedures that are accepted or prescribed as being correct or most effective.
Bonding	A low impedance path obtained by permanently joining all normally non-current carrying conductive parts to ensure electrical continuity and having the capacity to conduct safely any current likely to be imposed on it.
Borden System	Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 km east to west, and approximately 18.5 km north to south.
BPEX Structures	Above ground steel transition structures. BPEX structures contain three (3) potheads which are required for the transition from underground transmission cables to overhead transmission cables.
Bridge Modifications	Bridge modifications may be required to accommodate electrification along GO rail corridors. Types of bridge modifications include: Electrification Protection Barriers, OCS Attachments/Support Structures, Vertical Clearance, Flash Plates, and Grounding and Bonding.
Bridge Overpass	Bridge Overpass is defined as rail-under-road or pedestrian walkway.
Bridge Protection Barrier	Bridge protection barrier is to protect pedestrians and infrastructure users within the public right-of-way on overhead bridges from direct contact with adjacent live parts of the Overhead Catenary System (OCS). The barrier also protects against damage to the OCS passing under bridges by providing an obstacle to debris that may be thrown onto the railway from overhead.
Business Case	In the Metrolinx context, Business Cases are prepared to provide timely information on potential investments to inform decision-making and support investment optimization as the investment advances through planning, design, delivery and operation.
Canadian Standards Association Group (CSA Group)	An organization which works in Canada and around the world to develop standards in 50 different program areas, such as electronics, telecommunications, occupational health and safety, healthcare, energy efficiency, and construction products and materials. Accredited by the Standards Council of Canada, CSA Group has developed more than 3,000 standards, codes and related products for the safety, design or performance of a wide range of products and services.
Cantilever	A beam that is supported by a pole at only one end and carries the load of the electrification equipment on top of tracks. At multiple track locations where cantilever frames are not practical, portal structures should be utilized.
Catenary System	An assembly of overhead wires consisting of, as a minimum, a messenger wire, carrying vertical hangers that support a solid contact wire which is the contact interface with operating electric train pantographs, and which supplies power from a central power source to an electrically-powered vehicle, such as a train.
Ch	The contraction of Chainage, measurement in kilometres along the rail corridors, starting at the center of Union Station and radiating outwards along the corridors.
Circuit	A conductor or system of conductors which form an electrical section between two switching points.

Term	Definition
Class Environmental Assessment	A document that sets out a standardized planning process for those classes or groups of activities for which the applicant is responsible. It is also known as a "parent" document in some class environmental assessments. A class environmental assessment is approved under the *Environmental Assessment Act* and applies to projects that are carried out routinely and have predictable environmental effects that can be readily managed. Examples of Class Environmental Assessments include the *GO Transit Class Environmental Assessment* document and the *Class Environmental Assessment for Minor Transmission Facilities*.
Class Environmental Assessment for Minor Transmission Facilities	The purpose of the Class Environmental Assessment for Minor Transmission Facilities (also referred to as "Class EA Document") is to provide information that will enable the Minister of the Environment, Conservation and Parks (Minister) to approve, following a single review, certain types of frequently occurring transmission projects specified in the Guide to Environmental Assessment Requirements for Electricity Projects (2011) and in O. Reg. 231/08. The project will be relatively small in scale, have predictable environmental effects that can be likely mitigated, and can be planned and constructed in accordance with a common process.
Combustion	The chemical process where a substance reacts with oxygen to release energy.
Combustion Emissions	The emissions released from the combustion of fossil fuels. These include carbon dioxide (CO_2), carbon monoxide (CO), oxides of nitrogen (NOx), particulate matter, and volatile organic compounds (VOCs).
Compensation (Vegetation Removal)	The replacement of a lost/altered natural feature or area and its functions, services, and value. Compensation to be undertaken based on location and ownership in accordance with Metrolinx Vegetation Guideline, 2020.
Conceptual Design	The first design stage of a project. This stage includes creating ideas and considering the pros and cons of those ideas. This is done to minimize project risks and evaluate the overall potential success of the project.
Conditional Heritage Property	A property, including buildings and structures on the property, that is determined to potentially have cultural heritage value or interest and that is not owned by the Crown in right of Ontario or by a prescribed public body.
Consist	The composition of a train, including type and number of locomotives and number of cars.
Contact Wire	A solid grooved, bare aerial, overhead electrical conductor of an OCS that is suspended above the rail vehicles and which supplies the electrically powered vehicles with electrical energy through roof-mounted current collection equipment - pantographs - and with which the current collectors make direct electrical contact.
Control Centre	The building or room location that is used to dispatch trains and control the train and maintenance operations over a designated section of track.

Term	Definition
Control Point	An established coordinate location for a physical feature. Control points are used as the basis for improving the spatial accuracy of all other points to which they are connected and for generating other points within an established distance or area around the control point.
Cross Bonds	The method of tying tracks together electrically to equalize traction return currents between tracks. This is done to minimize touch potential.
Cross Feeding System	Overhead feeder lines are provided between the main gantry and strain gantry across the electrified track to feed power to the OCS wires.
Cultural Heritage Evaluation Report (CHER)	A report prepared by, or with advice from a qualified heritage professional, who gathered and recorded, through research, site visits and public engagement, enough information about the property to sufficiently understand and substantiate its cultural heritage value.
Cultural Heritage Screening Report (CHSR)	A report prepared with advice by a qualified person who gathered and recorded, through research, site visits and public engagement enough information about the study area to identify those properties that have potential or known cultural heritage value.
Cultural Heritage Value or Interest	Term used to associate a location or structure with having characteristics or history that is significant to the Province of Ontario and has the potential to be worth maintaining.
Data Gap Analysis	An analysis conducted on previously available studies and research to see what information is missing to determine what requires further study.
Deadhead Movements	Empty train movements required to reposition a train before or after revenue service. (Revenue service entails train movements that carry fare paying passengers). Deadhead movements are also referred to as “unproductive moves” as they incur the costs of train operations but are not offset by any revenue from passengers.
Design – Build – Finance – Operate – Maintain (DBFOM) Model	The Design-Build-Finance-Operate-Maintain model integrates the work of multiple companies into one contract. These companies form a special purpose vehicle called a Project Company or a consortium to complete the project. The DBFOM model is the most comprehensive public-private partnership model and it transfers the most risks from the public sector to the private sector through a performance-based contract.
Detailed Design	The detailed design phase of a project is defined as the phase of the project where design is refined past the conceptual phase, when plans, specifications, and estimates are created. This will take place after the TPAP is completed and before the construction phase.
Diesel Multiple Unit (DMU)	A train comprising single self -propelled diesel units.
Distribution Line (DL)	Electrical line conveying electricity at voltages less than 50kV.
Double Stacked Freight (DSF)	Freight trains carrying double stack containers.
Duct Bank	A duct bank is an assembly of electrical conduits that are either directly buried or encased in concrete. The purpose of the duct bank and associated conduit is to protect and provide defined routing of electrical cables and wiring. It also provides physical separation and isolation for the various types of cables.

Term	Definition
Durisol© Walls	Solid barrier required to meet Hydro One technical and safety requirements.
Ecological Land Classification (ELC)	A term used in Ontario to describe various systems to indicate natural regions based on ecological factors.
Electric and Magnetic Field (EMF)	Electric and magnetic fields arise from natural forces and permeate our environment. In addition to natural background EMF, anthropogenic sources include electric fields which arise anywhere electricity or electrical components are used and magnetic fields which arise wherever there is a flow of electric current. Common manmade sources of EMF include electronics, power stations, transmission lines, telecommunication infrastructure, electric motors, etc. The strength of man-made EMF depends on the characteristics of the source including amongst others, voltage, current strength and frequency.
Electric Multiple Unit (EMU)	A train comprising single self-propelled electric units.
Electric Section	This is the entire section of the overhead contact system (OCS) which, during normal system operation, is powered from a traction power substation (TPS) circuit breaker. The TPS feed section is demarcated by the phase breaks of the supplying TPS and by the phase breaks at the nearest SWS or line end. An electrical section may be subdivided into smaller elementary electrical sections.
Electric Traction Power Facility	The equivalent continuous sound level in A-weighted decibels equivalent to the total sound energy measured over a stated period of time.
Electrical Potential	A measurement of the voltage (or potential difference) between two points in a system. The unit for electrical potential is expressed in volts.
Electrical Protection Barriers (EPB)	Barriers are required on overhead bridges to ensure safety of the energized equipment. Approximate barrier height is 2 metres.
Electrification Performance Specifications (EPS)	Electrification Performance Specifications (EPS) are based on the combination of available knowledge, experience, industry Best Management Practices (BMP) and worldwide standards. These EPS outline the applicable design standards to be complied with and performance requirements to be met as part of delivering a safe, efficient and reliable electrified system. Accordingly, these specifications provided the context for the subsequent preparation of the GO Transit Network Electrification conceptual design.
Electromagnetic Compatibility (EMC)	The ability of a device, equipment, or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment.
Electromagnetic Interference (EMI)	A disturbance that affects an electrical circuit due to either electromagnetic induction or radiation from an external source.
Elementary Electrical Section	The smallest section of the OCS power distribution system that can be isolated from other sections or feeders of the system by means of disconnect switches and/or circuit breakers.
EMI Noise	Unwanted electrical signals that produce undesirable effects in the circuits of the control system in which they occur.

Term	Definition
Environmental Project Report (EPR)	The proponent is required to prepare an EPR to document the TPAP followed, including but not limited to: a description of the preferred transit project, a map of the project, a description of existing environmental conditions, an assessment of potential impacts, description of proposed mitigation measures, etc. The EPR is made available for public review and comment for a period of 30 calendar days. This is followed by a 35-day Minister's Decision Period.
Environmental Site Assessments (ESAs)	The study of a property to determine if contaminants are present and, if so, the location and concentration of these contaminants. This study includes a phase one environmental site assessment and where required a phase two environmental site assessment.
Environmentally Significant Area (ESA)	These are natural areas which are particularly significant or sensitive requiring additional protection to preserve their environmental qualities and significance.
Equivalent Sound Level	The equivalent continuous sound level in A-weighted decibels equivalent to the total sound energy measured over a stated period of time.
Existing Operations	Rail operations as of 2015, the Pre-project scenario.
Express Rail Service	GO train movements that do not stop at every GO Station along the Corridor.
Extremely Low Frequency (ELF)	The International Telecommunication Union (ITU) designation for electromagnetic radiation (radio waves) with frequencies from 3 to 30 Hz, and corresponding wavelengths from 100,000 to 10,000 kilometres.
Facility	Locations, structures, or facilities that have the potential to be impacted by or interact with the project.
Feeder	A current-carrying electrical connection between the overhead contact system and a traction power facility (substation, paralleling station or switching station).
Fisheries Act (1985)	The *Fisheries Act* (as amended in June 2019) is federal legislation intended to protect fish and fish habitat throughout Canada.
Flash Plate	A conductive plate installed above a bare energized wire and below reinforced concrete. The intent is to prevent 'flash over' which is where current finds its way into the reinforcing steel. Usually this is via water dripping, ice, or animals making the bridge between wire and concrete. The plate is bonded to the static wire.
Fossil Fuels	A group of combustible materials that have been formed from decayed plants and animals. These materials are often used as fuel by combusting them to release energy. Fossil fuels include oil, coal, and natural gas.
FRA Protocol	Federal Railroad Administration, U.S. Department of Transportation, High-Speed Ground Transportation Noise and Vibration Impact Assessment
Freight Switcher Trains	Freight trains with consists of 1 freight locomotive and 6 freight rail cars.
FTA Protocol	Federal Transit Administration, U.S. Department of Transportation, High-Speed Ground Transportation Noise and Vibration Impact Assessment

Term	Definition
Full Business Case (FBC)	This Business Case aligns with the part four of Metrolinx's stage gate process (Design and Procurement Preparation). The Full Business Case advances an investment to procurement and funding by confirming its scope, benefits, costs, and delivery approach.
Future Operations	Rail operations corresponding to the TSS1+ schedule, the Post-project scenario.
Gantry	The feeder wires from the TPS will be connected to the OCS with the help of gantries. The main gantry (also referred to as the catenary feeding gantry) is the one parallel to the track and closest to the TPF. Gantries are also used for traction power distribution. The feeder wires from the facility will be connected to the OCS with the help of gantries.
Genera	Plural of genius. The major subdivision of a family or subfamily in the hierarchy of biological classification of organisms, usually consisting of more than one species.
Geographic Information System (GIS)	Systems that are designed to capture, store, visualize, manipulate, analyze, manage, and present spatial or geographical data.
GO Expansion Program	Go Expansion is an investment program that will transform GO Rail into a Rapid Rail System that provides the expanded mobility the GTHA needs to accommodate growth and maintain a high quality of life and prosperous economy. GO Expansion is one of Canada's largest infrastructure and transport projects. It will cost $16.8 billion beyond the $38.9 GO Rail would need to spend over 60 years to continue to operate and maintain the system.
GO Station Platform	A GO Station platform is an area alongside a railway track providing convenient access to trains. All GO stations have some form of platform, with larger stations having multiple platforms.
Greater Toronto and Hamilton Area (GTHA)	The metropolitan region encompassing the City of Toronto, the four surrounding Regional Municipalities (Durham, Halton, Peel and York) and the City of Hamilton.
Greenhouse Gases	Gases that absorb infrared radiation emitted from the Earth thus containing the energy within the atmosphere. Total greenhouse gases are typically expressed as carbon dioxide equivalent (CO2e), which is the total mass of CO2 that would have the same impact on climate change as a mixture of greenhouse gases.
Grounding	Connecting to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to limit the build-up of voltages to levels below that which may result in undue hazard to persons or to connected equipment.
Grounding and Bonding – Bridges	Grounding and Bonding is required to prevent damage from flashovers to the bridge structures and to prevent step and touch potential from exceeding permissible limits as defined in the applicable standards.
Grounding Grid	A system of horizontal ground electrodes that consists of a number of interconnected, bare conductors buried in the earth, providing a common ground for electrical devices or metallic structures, usually in one specific location.

Term	Definition
Growth Plan for the Greater Golden Horseshoe (2019)	Growth Plan for the Greater Golden Horseshoe (2019) is a framework for implementing the Government of Ontario's initiative to plan for growth that supports economic prosperity, protects the environment, and helps communities achieve a high quality of life (Ministry of Municipal Affairs and Housing, 2019). It was prepared under the *Places to Grow Act* (2005) and is intended to guide decisions on a variety of issues, including the planning and management of transportation.
Heavy Maintenance	Heavy maintenance includes: replacement of engine traction motors, replacement of diesel engines on DMUs, replacement of transformers and ac propulsion systems on EMUs and replacement of wheel sets on engines. On railcars, heavy maintenance includes the replacement of wheel sets, repairs to windows and brake lines, and body repairs.
High Voltage (HV)	Refers to electrical energy at voltages high enough to cause injury and harm to human beings and living species. OESC describes high voltage for voltages over 750 V.
Hydro One	The utility that delivers electricity across the province of Ontario. Hydro One has four subsidiaries, the largest being Hydro One Networks. They operate 97% of the high voltage transmission grid throughout Ontario.
Immunity	The ability of equipment to perform as intended without degradation in the presence of an electromagnetic disturbance.
Impedance Bonds	An electrical device located between the rails consisting of a coil with a centre tap used to bridge insulated rail joints to prevent track circuit energy from bridging the insulated joint, while allowing the traction return current to bypass the insulated joint. The centre tap can also be used to provide a connection from the rails to the static wire and/or traction power facilities for the traction return current.
Initial Business Case (IBC)	The first Business Case prepared for a project in line with part two of Metrolinx's stage gate process (Feasibility and Options Analysis). This Business Case compares potential investments to identify if there is merit in further design and development.
Intake Protection Zone (IPZ)	Areas around municipal surface water intakes, designated primarily for emergency response purposes when the municipal water supply may be threatened with contamination.
Lines of Country	An atlas of railway and waterway history in Canada.
Local Rail Service	GO train movements that stop at every GO Station along the Corridor.
Low Voltage (LV)	According to the OESC LV is voltages between 30 V and 750 V.
Main Gantry	These 25 kV feeders from the TPF will be connected to the OCS with the help of main and strain gantries, as well as a cross feeder arrangement.
Maintenance Facility	A mechanical facility for the maintenance, repair, and inspection of engines and railcars.
Megavolt-Ampere (MVA)	This is a unit for measuring the apparent power in an electrical circuit equivalent of one million watts.

Term	Definition
Messenger Wire	In catenary construction, the OCS Messenger Wire is a longitudinal bare stranded conductor that physically supports the contact wire or wires either directly or indirectly by means of hangers or hanger clips and is electrically common with the contact wire(s).
Metrolinx Interim Cultural Heritage Management Process (2013)	The Metrolinx Interim Cultural Heritage Management Process (2013) involves four steps: • Step 1: Cultural Heritage Screening • Step 2: Heritage Evaluation • Step 3: Interim Cultural Heritage Management • Step 4: Review and Approval for Metrolinx Heritage Properties of Provincial Significance
Mid-span	Area between two OCS registration points.
Migratory Bird Convention Act (MBCA) (1994)	The federal *Migratory Bird Convention Act, 1994* (MBCA) protects most migratory birds and their nests in Canada. Bird families not protect under the Act include grouse, quail, pheasants, ptarmigan, hawks, owls, eagles, falcons, cormorants, pelicans, crows, jays, kingfishers, and some species of blackbirds; however, these bird families have some level of protection under the *Fish and Wildlife Conservation Act, 1997* (FWCA).
Minimum Vertical Clearance (MVC)	A clearance plate defines the maximum height and width for railway vehicles to ensure safe passage through bridges, tunnels and other structures. Standard plates are used throughout North America so that train operators know what size equipment will safely pass on a given line.
Mitigation Measure	An action taken to lessen or reduce the severity of potential adverse environmental effects or enhance positive environmental effects. These measures could include construction techniques, compensation or community enhancement.
Modelling	The process of using collected data and information to generate rational predictions regarding the future implementation of project components.
Non-Revenue Trains	GO and VIA train movements that do not carry passengers. These movements typically occur between layovers or maintenance facilities and GO Stations.
Notice of Commencement	Notice prepared by the proponent of the TPAP, which includes information as outlined *in O.Reg. 231/08, s. 7(2)*, and is distributed as described in *s.7(3) of O.Reg. 231/08.* The first day on which the Notice of Commencement of the TPAP is published in a newspaper marks the project commencement date. The proponent has 120 days following the Notice of Commencement to prepare and distribute the Environmental Project Report and issue the Notice of Completion.

Term	Definition
Notice of Completion	Refers to the Notice of Completion as outlined in *O.Reg. 231/08, s.11.* After conducting consultation in accordance with *O.Reg. 231/08, s.8* and preparing the Environmental Project Report, the proponent shall prepare a Notice of Completion of the Environmental Project Report. The preparation and distribution of the notice shall be in accordance with *O.Reg. 231/08, s. 11.* The Notice of Completion shall be issued within 120 days of the issuance of the Notice of Commencement (i.e., project commencement date), unless a Notice of Issue (i.e., suspension of 120-day period) is issued. The date on which the Notice of Completion is issued marks the start of a 30-day public review period of the Environmental Project Report.
Notice of Environmental Project Report (EPR) Addendum	Refers to the Notice of Environmental Project Report Addendum as outlined in O.Reg. 231/08, s.15, where a proponent wishes to make a change to the transit project that is inconsistent with its Environmental Project Report and the proponent considers the change significant. The Notice of Environmental Project Report Addendum shall be issued after the Statement of Completion is submitted by the proponent of the TPAP, and before construction or installation of the significant change to the transit project begins, and after following the steps required in O.Reg. 231/08, s. 15(6) of the regulation to identify Indigenous communities. The date on which the Notice of Environmental Project Report Addendum is issued marks the start of a 30-day public review period of the Environmental Project Report Addendum.
NPC-300: Environmental Noise Guideline - Stationary and Transportation Noise Sources - Approval and Planning	A guideline on the proper control of sources of noise emissions to the environment. The Ministry of the Environment and Climate Change (MOECC) ensures sources of emissions to the environment are adequately controlled to prevent potential negative effects. Published by the Ministry of Environment and Energy: August 2013
OCS Attachments/Support Structure	To run OCS wires under overhead bridges without attachments, there must be enough clearance between the messenger wire/catenary and the lowest part of the bridge structure. Where enough clearance does not exist, attachments (e.g., tunnel arms) on the structure are required to support the OCS. In addition, for rail overpass structures, OCS support structures (i.e., portals/cantilevers) may need to be installed on the structure to support the OCS system.
Official Plan	An Official Plan is a policy document that guides the short-term and long-term development in a community. It applies to all lands within the municipal boundary and the policies within it provide direction for the size and location of land uses, provision of municipal services and facilities, and preparation of regulatory bylaws to control the development and use of land.
Ontario Heritage Act (OHA) (1990)	Legislation giving municipalities and the provincial government powers to preserve the heritage of Ontario by protecting heritage properties and archaeological sites.
Ontario Planning Act (1990)	The *Planning Act* (the Act) is provincial legislation that sets out the ground rules for land use planning in Ontario. It describes how land uses may be controlled, and who may control them.

Term	Definition
Ontario Provincial Policy Statement (2020)	The Provincial Policy Statement, 2020 is issued under section 3 of the *Planning Act*. It is effective May 1, 2020 and applies to planning decisions made on or after that date. It replaces the Provincial Policy Statement, 2014.
O. Reg. 231/08: Transit Projects and Metrolinx Undertakings	O.Reg 231/08 is provincial legislation that sets out the ground rules for transit project in Ontario. It describes exceptions for Metrolinx projects.
Open Route	An area of tracks where there are no vertical conflicts to the OCS.
Orthoimagery	An orthoimage is a raster image that has been geometrically corrected (orthorectified) to remove distortion caused by differences in elevation, sensor tilt and, optionally, by sensor optics.
Overhead Contact Line Zone (OCLZ)	The zone whose limits are not likely to be exceeded by a broken overhead contact line. Protective measures against unacceptable voltages are necessary in this zone.
Overhead Contact System (OCS)	A system that is comprised of: • The aerial supply system that delivers 2x25 kV traction power from traction power substations to the pantographs of Metrolinx electric trains, comprising the catenary system messenger and contact wires, hangers, associated supports and structures including poles, portals, head spans and their foundations), manual and/or motor operated disconnect switches, insulators, phase breaks, section insulators, conductor termination and tensioning devices, downguys, and other overhead line hardware and fittings. • Portions of the traction power return system consisting of the return feeder and aerial static wires, and their associated connections and cabling.
Overhead Contact System (OCS) Impact Zone	The defined zone within which Overhead Contact System (OCS) infrastructure will be built (e.g., OCS foundations, portal/cantilever poles, etc.).
Overhead Structure	A structure that allows a road to cross over a railway underneath.
Overpass	A structure that allows a railway to cross over a road or watercourse underneath.
Pantograph	Device on the top of a train that slides along the contact wire to transmit electric power from the catenary to the train.
Paralleling Station (PS)	This type of traction power facility contains an autotransformer which helps support the OCS voltage in the electrified system.
Performance Standards	General specifications and criteria that define the parameters and requirements of a particular system.
Phase Break	An arrangement of insulators and grounded or non-energized wires or insulated overlaps, forming a neutral section, which is located between two sections of OCS that are fed from different phases or at different frequencies or voltages, under which a pantograph may pass without shorting or bridging the phases, frequencies, or voltages.

Term	Definition
Pipeline	A line that is used or to be used for the transmission of oil, gas or any other commodity and that connects a province with any other province or provinces or extends beyond the limits of a province or the offshore area and includes all branches, extensions, tanks, reservoirs, storage facilities, pumps, racks, compressors, loading facilities, interstation systems of communication by telephone, telegraph or radio and real and personal property, or immovable and movable, and works connected to them, but does not include a sewer or water pipeline that is used or proposed to be used solely for municipal purposes.
Places to Grow Act (2005)	The purposes of the Act are, • to enable decisions about growth to be made in ways that sustain a robust economy, build strong communities and promote a healthy environment and a culture of conservation; • to promote a rational and balanced approach to decisions about growth that builds on community priorities, strengths and opportunities and makes efficient use of infrastructure; • to enable planning for growth in a manner that reflects a broad geographical perspective and is integrated across natural and municipal boundaries; and • to ensure that a long-term vision and long-term goals guide decision-making about growth and provide for the co-ordination of growth policies among all levels of government. 2005, c. 13, s. 1.
Portal	An OCS structure that spans over the tracks between two OCS support poles located on the sides of the tracks in order to support the electrification equipment. The portal structure is used at multiple track locations where cantilever frames are not practical.
Portal Boom	Top steel section or truss/lattice at the top of the portal structure, supported by two columns placed either side of the railway. It provides support points for the OCS conductors.
Positive Train Control	A signaling system using on board and wayside equipment to automatically reduce the speed, or stop a train depending on the conditions on the track ahead.
Potential Effect	A potential impact (effect) that a proposed undertaking has or could potentially have on the environment, either positive or negative, direct or indirect, short- or long-term.
Potentially Contaminating Activity (PCA)	Use or activity at the site that has the potential to result in soil and/or groundwater. Examples are set out in Table 2, Schedule D of *O.Reg. 153/04*.
Potheads	Insulated electrical terminal used for transitioning high voltage underground transmission cables to overhead transmission cables.
PM Bay	A progressive maintenance bay and wash station is proposed to perform routine maintenance.
Preliminary Design	The design of a proposed project (including a detailed cost estimate) to a level that demonstrates that the project is buildable within the given parameters of the design scope.
Preventive Maintenance	Preventive maintenance includes items such as: replacing brake pads, measuring wheels, inspection of running gear, inspection and repair of central air conditioning, check radios and repair/replace, repair broken windows and doors, etc.

Term	Definition
Primary Voltage	Typically, between 750V and 50kV.
Progressive Maintenance (PM)	The light maintenance of rail stock (i.e., window cleaning, check oil levels and sand levels, clean engine cab, refill potable water, and empty washroom holding tanks).
Proponent	A person, agency, group, or organization that carries out or proposes to carry out an undertaking, or is the owner or person having charge, management or control of an undertaking.
Provincial Heritage Property (PHP)	A property, including buildings and structures on the property, that has cultural heritage value or interest and that is owned by the Crown in right of Ontario or by a prescribed public body; or that is occupied by a ministry or a prescribed public body if the terms of the occupancy agreement are such that the ministry or public body is entitled to make the alterations to the property that may be required under these heritage standards and guidelines.
Provincial Heritage Property of Provincial Significance (PHPPS)	A provincial heritage property that has been evaluated using the criteria found in *Ontario Heritage Act O. Reg. 10/06* and has been found to have cultural heritage value or interest of provincial significance.
Provincially Significant Wetland (PSW)	Wetlands that have been evaluated using the Ontario Wetland Evaluation System by a certified wetland evaluator and that have satisfied the Ontario Wetland Evaluation System criteria for significance.
Raceway	A group of conduits designed to protect electrical cabling, often consolidated in a buried or encased structure. The purpose of the Raceway and associated conduit is to protect and provide defined routing of electrical cables and wiring. It also provides physical separation and isolation for the various types of cables.
Rail Overpass	Rail overpass is defined as rail over road or water.
Rail Right-of-Way	Land that is reserved, usually through legal designation, for transportation purposes, such as for railway line. A right-of-way is often reserved for the maintenance or expansion of existing services.
Rail Track	A track with a designated location at the station to board and disembark trains is called station track or house track regardless of whether it is a main line or loop line. If such track is served by a platform, the track may be called platform track.
Rail Underpass	Rail underpass is defined as rail tunnel that runs underneath a road or railroad.
Reference Concept Design (RCD)	The Reference Concept Design illustrates how an investment be delivered. This reference concept design is used to: • Demonstrate that a working approach to deliver GO Expansion is possible. • Determine a budget and construction schedule to be approved by Treasury Board.

Term	Definition
Regional Transportation Plan: The Big Move (2008)	The Big Move is the GTHA's first ever Regional Transportation Plan (RTP), The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area. The *Big Move* provides the blueprint for transforming the regional transportation system over the next 25 years. Its proposed future regional transportation network includes "regional rail" and "express rail" services. Of the 92 Priority Actions and Supporting Policies in The Big Move, nine are highlighted as 'Big Moves'. These priority actions are intended to have the largest and most transformational impacts on the GTHA's transportation system.
Regulatory Agency	Government ministries, agencies, authorities, or departments (federal; provincial, including local conservation authorities; and, municipal, including local boards of health) who may have an interest, participate and contribute to the review of documentation prepared by the proponent for a transit project by providing comments based on their mandate.
Resilient Arm	A combined registration and support assembly with vertical resilience, used for support of catenary conductors in situations with restricted clearance such as tunnels and overhead bridges.
Retaining Wall	A retaining wall is any wall designed to resist lateral earth and/or fluid pressures, including any surcharge, in accordance with accepted engineering practice. The following types of retaining walls may be considered for implementation and will be subject to confirmation as part of the detailed design phase: • Lock block wall – concrete blocks that are stacked to create retaining walls; • Precast Concrete Lagging with Cantilevered Soldier Pile; • Precast Concrete Lagging with Solider Pile and Tieback; and • Sheet Pile.
Revenue Trains	GO or VIA train movements that carry passengers between stations. These trains do not stop at layovers or maintenance facilities.
Right-of-Way (ROW)	Land that is reserved, usually through legal designation, for transportation and/or utility purposes, such as for a hydro corridor, rail line, street or highway. A right-of-way is often reserved for the maintenance or expansion of existing services. A permit or legal permission is generally required for any work or encroachment on a right-of-way. For the purposes of this report, ROW refers to rail ROW unless otherwise specified.
Rouge River Fisheries Management Plan (RRFMP)	The Rouge River Fisheries Management Plan (TRCA, 2010).
Running Rails	Rails that act as a running surface for the flanged wheels of a car or locomotive.
SAR Screening	The suitability of an area to support habitat preferred by SAR species is based on a combination of factors; including, but not limited to: a species' requirements for critical life stages and adaptability, seasonal temperatures, precipitation, soils, vegetation, aquatic conditions, existing disturbances and land form.

Term	Definition
Screening	The process of applying criteria to a set of alternatives in order to eliminate those that do not meet minimum conditions or requirements.
Secondary Plan	A secondary plan is a land use plan for a particular area of a municipality that is prepared as an amendment to an official plan. Typically, a secondary plan will provide more detailed policies for the area it covers, such as public spaces, parks and urban design.
Secondary Voltage	Typically, less than 750V.
Service Maintenance	Service maintenance is the light maintenance of engines (i.e., window cleaning, check oil levels and sand levels, clean engine cab, refill potable water, and empty washroom holding tanks).
Shield	As normally applied to instrumentation cables, refers to a conductive sheath (usually metallic) applied, over the insulation of a conductor or conductors, for providing means to reduce coupling between the conductors so shielded and other conductors that may be susceptible to, or which may be generating, unwanted electrostatic or electromagnetic fields (noise).
Shielding	The use of the conducting and/or ferromagnetic barrier between a potentially disturbing noise source and sensitive circuitry. Shields are used to protect cables (data and power) and electronic circuits. They may be in the form of metal barriers, enclosures, or wrappings around source circuits and receiving circuits. Additionally, shielding is used to protect overhead transmission lines or OCS from incidents of lightning, in regions of high isoceraunic activity. Shield wire is located above the exposed current carrying wires to provide a 45-degree angle of protection. In sensitive applications, the angle is reduced to 30 degrees for more conservative design.
Signal Bridges	A structure for mounting signals that spans one or more tracks. Signal bridges may be footed on both ends, or they may be 'cantilever signal bridges', footed only on one end.
Signal System	A combination of wayside and on-board equipment and/or software to provide for the routing and safe spacing of trains or rail vehicles.
Significant Wildlife habitat (SWH)	SWH is categorized as potential to occur “candidate” or “confirmed” within the Project study area. While some “edge” of SWH features (i.e. adjacent wetlands, forests) may occur associated with proposed track and layover facilities, these edges generally occur within the existing modified footprint of the Project study area and are considered to exhibit pre-disturbed conditions.
Source Protection Area (SPA)	Areas organized by the Ministry of Environment, Conservation and Parks that cover one or more watersheds, typically managed by their applicable conservation authority.
Source Protection Plan (SPP)	Source Protection Plans contain policies that, when implemented, will manage or prohibit significant threat activities so they cannot pollute or deplete the sources of municipal drinking water.
Species at Risk (SAR)	A species, subspecies, variety or genetically or geographically distinct population of animal, plant or other organism, other than a bacterium or virus, that is native to Ontario. Species at Risk in Ontario are all the species that are classified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as either extirpated, endangered, threatened, or special concern.

Term	Definition
Species at Risk Act (SARA) (2002)	SARA is the official list of wildlife species at risk in Canada and includes species listed as Extirpated, Endangered, Threatened and of Special Concern.
Spur	A railroad track that diverges from the main track to service a specific location or industry.
Statement of Completion	As per *O.Reg. 231/08, s. 14*., the statement of completion is completed by a proponent and submitted to the Director of the MECP Environmental Approvals Branch and the Regional Director to formalize the completion of the Transit Project Assessment Process.
Static Wire (Aerial Ground Wire)	A wire usually installed aerially adjacent to or above the catenary conductors and return feeders, that connects OCS supports collectively to ground or to the grounded running rails to protect people and installations in case of an electrical fault.
Steel Monopole	A single steel pole structure placed within the centreline of existing transmission towers. A steel monopole is used to raise existing overhead transmission cables to achieve required vertical clearances.
Strain Gantry	These 25 kV feeders from the TPF will be connected to the OCS with the help of main and strain gantries and a cross feeder arrangement. The strain gantry is located within the ROW parallel to and on the opposite side of the track from the TPF, with footprints exactly equal to that of the main gantry.
Study Area	The study area is defined as the limits of the geographic area being examined as part of the TPAP.
Switches	The function of a switch is to enable a train to be guided from one track to another at a railway junction. Switches allow trains to easily move across the network, providing increased service.
Switching Station (SWS)	SWS is an installation where the supplies from two adjacent traction power substations are electrically separated and where electrical energy can be supplied to an adjacent but normally separated electrical section during contingency power supply conditions. It also acts as a paralleling station.
Touch/Step Potential	Touch potential is defined as the difference voltage between the hand touching the energized object and the feet of a person in contact with the ground. Step potential is defined as the voltage difference between the feet of a person standing near an energized grounded object.
Top of Rail	Top of Rail is defined as the highest point in a running rail profile.
Traction Power Return System	The traction power return system includes all conductors (including the grounding system) for the electrified railway tracks, which form the intended path of the traction return current from the electrified rolling stock to the traction power substations. Conductors may include: • Running rails • Impedance bonds • Static wires, and buried ground or return conductors • Rail and track bonds • Return cables, including all return circuit bonding and grounding interconnections • Ground • Autotransformer feeders due to the configuration of autotransformer connections

Term	Definition
Traction Power Substation	Electric Traction Power Facility that transforms the utility supply voltage of 230 kV to 50 kV and 25 kV for distribution to the trains via catenary and autotransformer return feeders.
Train Layover Facility	A train layover facility is needed to: • Store, service (including fueling – until electrification), inspect and maintain trains when they are not in service; • Carry out minor repairs or replacement for items such as lights, interior car lights, brake shoes, air hoses, and electrical and communications; and • Co-ordinate trains during off-peak periods, thereby keeping unused trains off active tracks to minimize congestion at stations.
Train Service Scenario (TSS1)	The Train Service Scenario (TSS1) is the output of transportation modelling studies performed by Metrolinx and is one of the tools used to better understand the requirements that will support Metrolinx's GO Expansion Program.
Train Storage Yard	A train storage yard is used to store trains during the day as well as overnight to reduce congestion on the rail corridor and minimize non-revenue travel by being near major GO stations.
Transit Project Assessment Process (TPAP)	This process is defined in sections 6 through 17 in *O. Reg 231/08*. It consists of various steps and requirements. It is a focused impact assessment process that includes consultation, an assessment of potential positive and negative impacts, an assessment of measures to mitigate negative impacts, and documentation.
Transmission Line (TL)	Electrical line conveying electricity at voltages more than 50kV.
Transmission Station (TS)	This station may refer to a transformer station, switching station, compensation station, regulating station, terminal or tap station, high voltage direct current station or another type of substation used in the transmission and/or transformation of electrical power. In Ontario, transmission stations include those whose nominal operating voltage is equal to or greater than 115 kV or equal to or less than 500 kV. Where a station has more than one voltage level, the highest level is used in defining the station's nominal operating voltage.
Tree Protection Zone (TPZ)	Tree Protection Zones are the minimum required distances where tree protection is to be put in place so that no construction activity of any kind will take place inside the Tree Protection Zone.
Underground Feeder Connection	An underground conduit carrying electrical connection between the overhead contact system and a traction power facility (i.e., traction power substation, paralleling station or switching station).
Utility	An entity that generates, transmits and/or distributes electricity, water and/or gas from facilities that it owns and/or operates, including electrical transmission and distribution companies, communication companies, community antenna distribution systems and regional / municipal authorities.
Utility Bridge	Bridge structure made largely of aluminum that will carry Hydro One electrical infrastructure above-grade at each USRC subway.

Term	Definition
Vegetation Clearing Zone	A Vegetation Clearing Zone is required in order to provide safe electrical clearances to any existing vegetation along the rail corridors. The Vegetation Clearing Zone entails vegetation removals within the area encompassed by the overhead contact system/2 X 25 kV feeders plus an additional 2 metre (m) offset area on either side of the OCS components or 2 X 25 kV feeders.
VIA Trains	Passenger trains that travel through portions of the Metrolinx Corridors.
Viewshed	The area of visual influence of the project components.
Wellhead Protection Ares (WHPA)	Areas where water travels through the ground to a municipal well.

Executive Summary

Project Overview

On December 11, 2017, the Minister of the Environment and Climate Change (now referred to as Minister of the Environment, Conservation and Parks) issued a Notice to Proceed to Metrolinx and Hydro One (as Co-Proponents) for the GO Rail Network Electrification Environmental Project Report (EPR) to convert six GO owned rail corridors from diesel to electric propulsion. Metrolinx subsequently issued a Statement of Completion for the GO Rail Network Electrification Transit Project Assessment Process on December 15, 2017.

The purpose of this EPR Addendum is to document and assess the potential environmental impacts of changes to the project design associated with new/upgraded tracks, new layover facilities, (which are the subject of the New Track and Facilities TPAP and the Scarborough Junction Grade Separations TPAP), additional infrastructure required within the Union Station Rail Corridor (USRC) and surrounding areas to address identified conflicts with existing Hydro One transmission infrastructure and revisions required to update noise, vibration and air quality studies that have occurred since the completion of the 2017 GO Rail Network Electrification EPR (see **Figure 0-1** for a map of the Study Area).

EPR Addendum Process

As per *Section 15(1), Ontario Regulation 231/08,* any change that is inconsistent with a previously approved EPR requires a reassessment of the effects associated with the project, the identification of potentially new mitigation measures, and potentially new monitoring systems in an Addendum to the previously approved EPR.

The following are the key steps in the EPR Addendum process:

- Prepare an assessment of the effects the proposed change may have on the environment.
- Prepare and distribute an EPR Addendum.
- Prepare and distribute a Notice of Environmental Project Report Addendum.
- Review by the public and stakeholders prior to proceeding with the proposed Addendum.

In addition to the required key steps listed above, in order to enhance the planning process for this project, Metrolinx voluntarily conducted additional consultation, including four (4) rounds of public meetings, as described in Section 5.

Update to the Project Description

This GO Rail Network Electrification EPR Addendum addresses the following changes to the previously approved 2017 EPR:

Revised OCS Impact/Vegetation Clearance Zones

Since the 2017 EPR, Metrolinx has undertaken additional studies and engineering design to identify the additional infrastructure required to meet targeted GO Expansion service levels that have resulted in changes to the limits of the previously defined seven (7) metre OCS Impact/Vegetation Clearance Zones as previously established as part of the GO Rail Network

Electrification TPAP. These new infrastructure requirements include but are not limited to: new or modified track infrastructure along railway ROWs, new layover and/or storage facilities along select rail corridors, along select rail corridors that constitute revised OCS Impact/Vegetation Clearance Zone limits along rail corridors to be electrified.

The revised limits of the OCS Impact/Vegetation Clearance Zone assessed as part of this EPR Addendum relied on the proposed project infrastructure footprints (including property requirements) defined through the following TPAPs:

- New Track & Facilities (NT&F) TPAP
- Scarborough Junction Grade Separation (SJGS) TPAP

Several new tracks and track upgrades, as well as new layover/storage yard facilities have been proposed as part of the NT&F TPAP. A new train layover facility (to be electrified) was also proposed as part of the SJGS TPAP. Therefore, a review and assessment of potential impacts from an electrification perspective is required.

The scope of this Significant Addendum to the GO Rail Network Electrification EPR includes examining the potential environmental effects of building, operating and maintaining the electrification infrastructure needed to electrify the additional infrastructure being assessed as part of the NT&F TPAP and SJGS TPAP.

Changes to Proposed Infrastructure within Union Station Rail Corridor

Following the 2017 EPR, Metrolinx has undertaken additional review and analysis, in coordination with Hydro One, to confirm locations within and along the USRC where the proposed electrification infrastructure is in conflict with existing overhead Hydro One infrastructure. Therefore, to eliminate these conflicts, additional engineering design has been undertaken to identify solutions for relocating Hydro One transmission infrastructure. In order to ensure that potential environmental impacts of these relocations/solutions are evaluated, these proposed works are being assessed as part of this 2021 EPR Addendum. Specifically, this entails relocating Hydro One transmission infrastructure in the vicinity of the USRC from approximately Mile 0.72E (just east of Henry Lane Terrace) to Mile 1.72E (just west of the Don River Valley).

Revised GO Expansion Service Level Plan

Changes to the anticipated GO Expansion service levels (compared to those previously assessed in 2017) have been identified, which constitute the need for revised noise, vibration and air quality impact assessment studies. The revised service levels and operating scenario are generally described as follows.

The new GO Expansion Service Plan[1] (also referred to as the *Ultimate Capacity Train Service Schedule*) anticipates the following ultimate weekday train trips per day:

- Union Station Rail Corridor – 703
- Lakeshore West - 267
- Kitchener – 164
- Barrie Rail – 245
- Stouffville – 351
- Lakeshore East – 251

[1] The service plan is based on current forecasts of future demand for express rail service and is subject to revision.

Future demand will be met with new electric rolling stock and existing diesel trains in the following configurations:

- Electric locomotive powered 12- car (peak period) and 6-car (off-peak period) trains;
- Diesel locomotive powered 12-car (peak period) and 6-car (off-peak period) trains; and
- Electric Multiple Units (EMU) with 1 to 4 units. EMUs are self-powered electric cars that are not pulled or pushed by locomotives.

According to the service plan, some locations will be served by electric trains (Metrolinx-owned rail lines), some by a mix of electric and diesel trains (rail corridors with joint ownership), and others by only diesel trains (rail lines not owned by Metrolinx).

EPR Addendum Project Area

Revised OCS Impact/Vegetation Clearance Zones

A mapping overlay exercise was completed utilizing Geographic Information Systems (GIS) software and relying on the conceptual design information for the infrastructure proposed from the aforementioned TPAP projects to establish the revised limits of the seven (7) metre OCS Impact/Vegetation Clearance Zones in the applicable areas along each affected rail corridor. Accordingly, updated Conceptual Electrification Corridor Plans were generated that present the study area examined as part of this Addendum (refer to **Appendix N)**.

The GO Rail Network Electrification EPR Addendum study area key plan is provided in **Figure 0-1** below.

USRC Hydro One Conflicts Study Areas

The USRC Hydro One Conflicts Study Areas extends from approximately Mile 0.72E (just east of Henry Lane Terrace) to Mile 1.72E (just west of the Don River Valley), along the Union Station Rail Corridor in the City of Toronto, and include the following elements/locations (see **Figure 1-5**):

- Lower Sherbourne Street Bridge (Subway);
- Parliament Street Bridge (Subway);
- Cherry Street Bridge (Subway);
- Esplanade Transmission Station;
- Don Fleet Junction (JCT) (including new and existing sites adjacent to Lower Don Trail); and
- Portion of the Corktown Common, where future steel monopole is proposed that will be studied under a separate addendum.

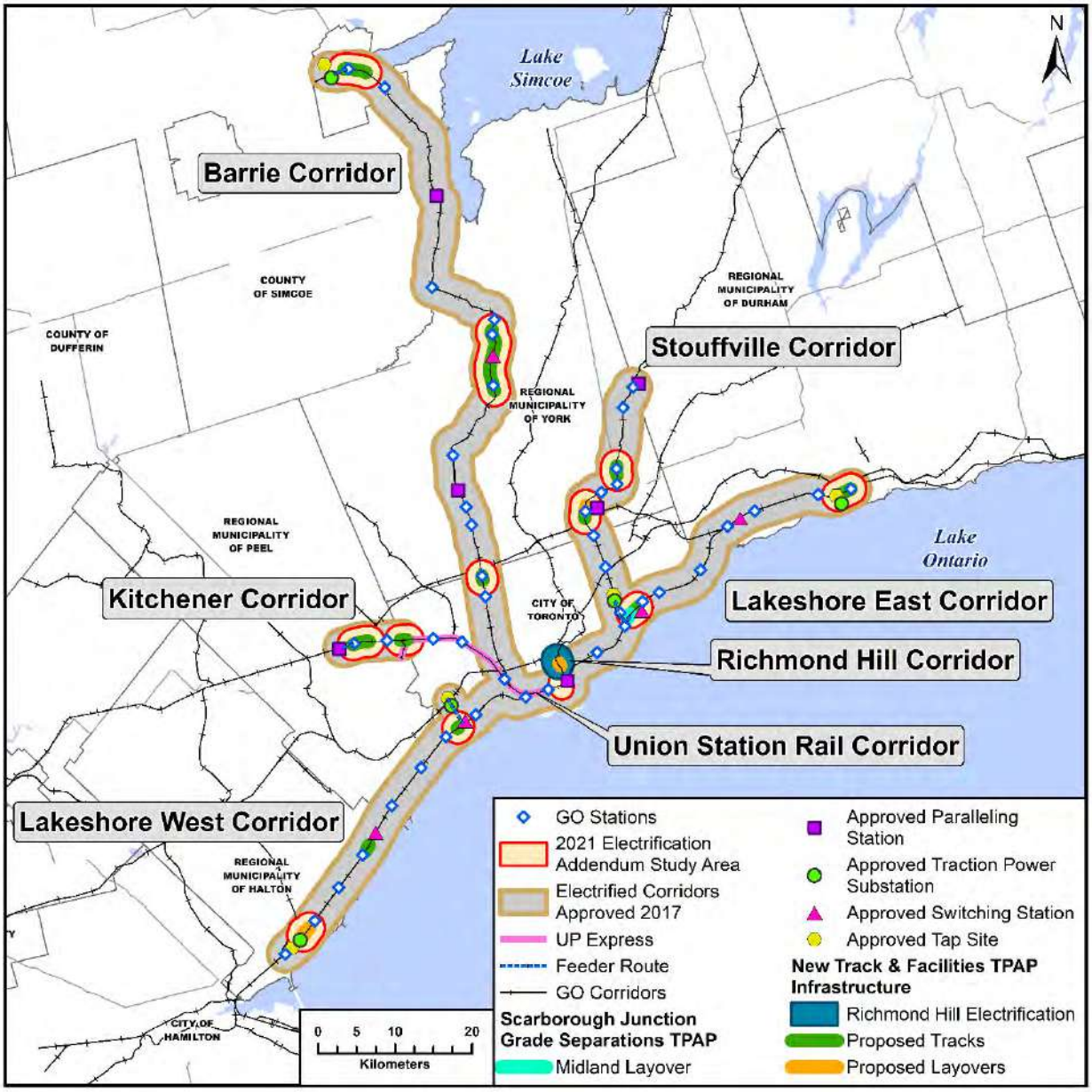

FIGURE 0-1: GO RAIL NETWORK ELECTRIFICATION EPR ADDENDUM STUDY AREA

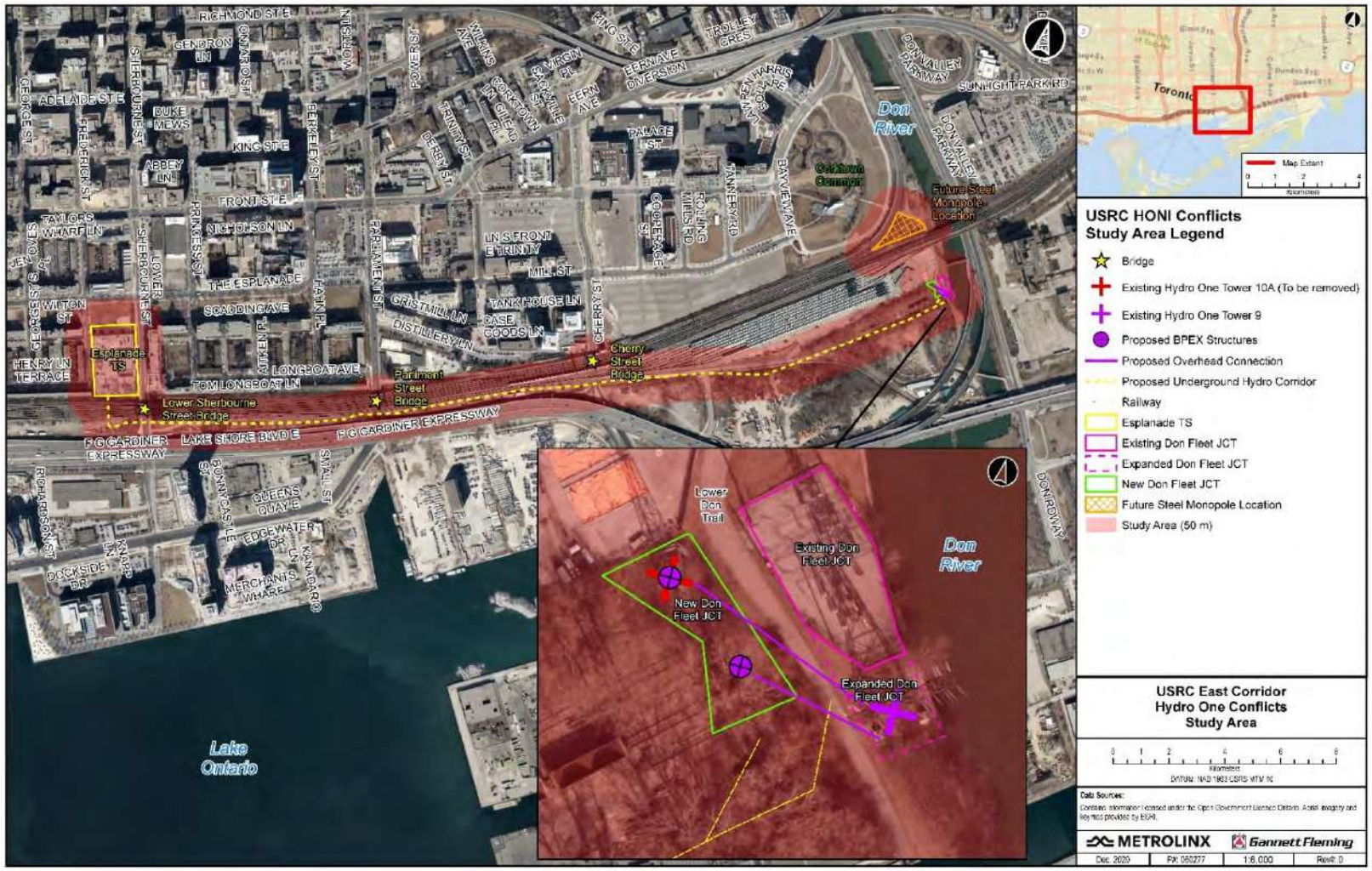

FIGURE 0-2: USRC HYDRO ONE CONFLICTS STUDY AREAS[2]

[2] Metrolinx and Hydro One have identified the need to locate an additional Hydro One transmission structure (i.e., steel monopole) between the Lower Don Valley River and Corktown Common to accommodate clearance requirements for the USRC Overhead Catenary System (OCS). A future addendum is to be completed to address environmental assessment requirements for this structure; at which time the significance of potential impacts will be determined.

Study Areas Associated with Noise, Vibration Studies

The updated Noise and Vibration Assessment included studies for the following Metrolinx-owned rail corridors includes (see **Figure 0-3**):

- Union Station Rail Corridor – From Union Station to Cherry Street;
- Lakeshore West Rail Corridor – From Strachan Avenue to approximately 1 km west of Burlington GO Station;
- Kitchener Rail Corridor – From the UP Express Pearson International Airport Spur to Bramalea GO Station;
- Barrie Rail Corridor - From Parkdale Junction (off Kitchener Corridor) to Allandale Waterfront GO Station;
- Stouffville Rail Corridor – Scarborough Junction north to Lincolnville GO Station; and
- Lakeshore East Rail Corridor – From just east of the Don River to Oshawa GO Station.

Study Areas Associated with Air Quality Studies

The Air Quality Assessment Update includes a network-wide “regional” assessment and three area-specific “local” assessments. The Regional Air Quality Study scope and study area includes six Metrolinx-owned rail corridors including:

- Union Station Rail Corridor – From Union Station to Cherry Street;
- Lakeshore West Rail Corridor (including the Canpa Subdivision) – From Strachan Avenue to approximately 1 km west of Burlington GO Station;
- Kitchener Rail Corridor – From the UP Express Pearson International Airport Spur to Bramalea GO Station;
- Barrie Rail Corridor – From Parkdale Junction (off Kitchener Corridor) to Allandale Waterfront GO Station;
- Stouffville Rail Corridor – From Scarborough Junction north to Lincolnville GO Station; and;
- Lakeshore East Rail Corridor – From just east of the Don River to Oshawa GO Station.

As part of the Local Air Quality Assessments, Metrolinx looked at the local ambient air pollutant concentrations on three electrified corridors where diesel train service is expected to increase, including:

- Union Station Rail Corridor – from Union Station for approximately 1.7 km to the east to Cherry Street;
- Kitchener Rail Corridor – from east of Malton GO Station for approximately 800 m to the west; and
- Lakeshore East Rail Corridor[3] – From the Don River east to Whitby Rail Maintenance Facility[4]; and

For all other corridors, increased service levels will be achieved by adding electrified trains and diesel train traffic levels will either remain the same or decrease in the future. As such, local air quality assessments were not required. It is noted that a local air quality assessment was

[3] Due to the long length of the Lakeshore East Corridor, the study area was divided into four study segments.
[4] Referred to as East Rail Maintenance Facility (ERMF) within the 2017 GO Rail Network Electrification EPR.

undertaken for the Richmond Hill Corridor and associated impacts have been documented as part of the New Track & Facilities TPAP. See **Figure 0-4**.

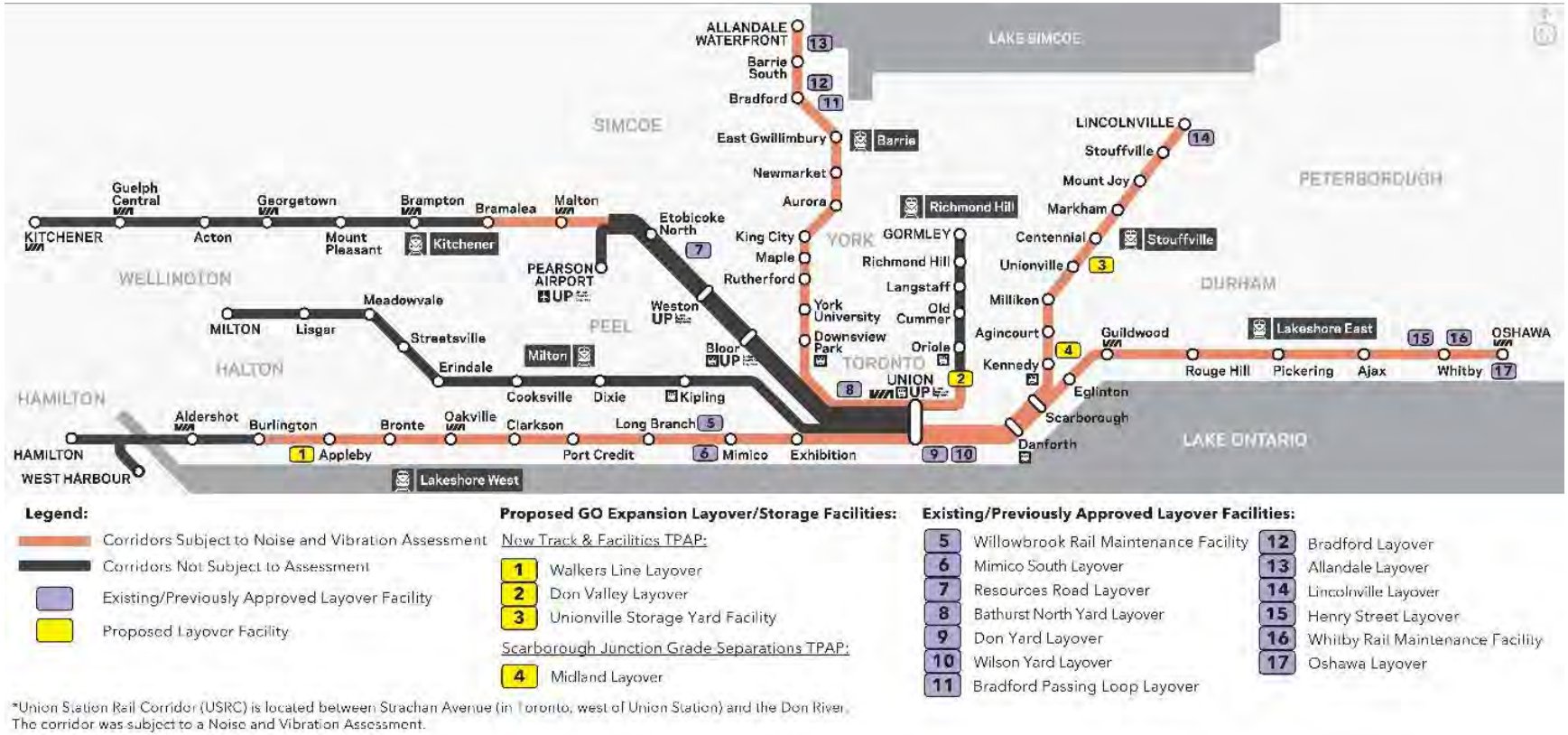

FIGURE 0-3: NOISE AND VIBRATION ASSESSMENT STUDY AREAS[5]

[5] Only some of the GO Expansion program study elements (and proposed infrastructure) are depicted in the map above. Infrastructure already studied in past TPAPs and future planned works including future stations are not included in the map.

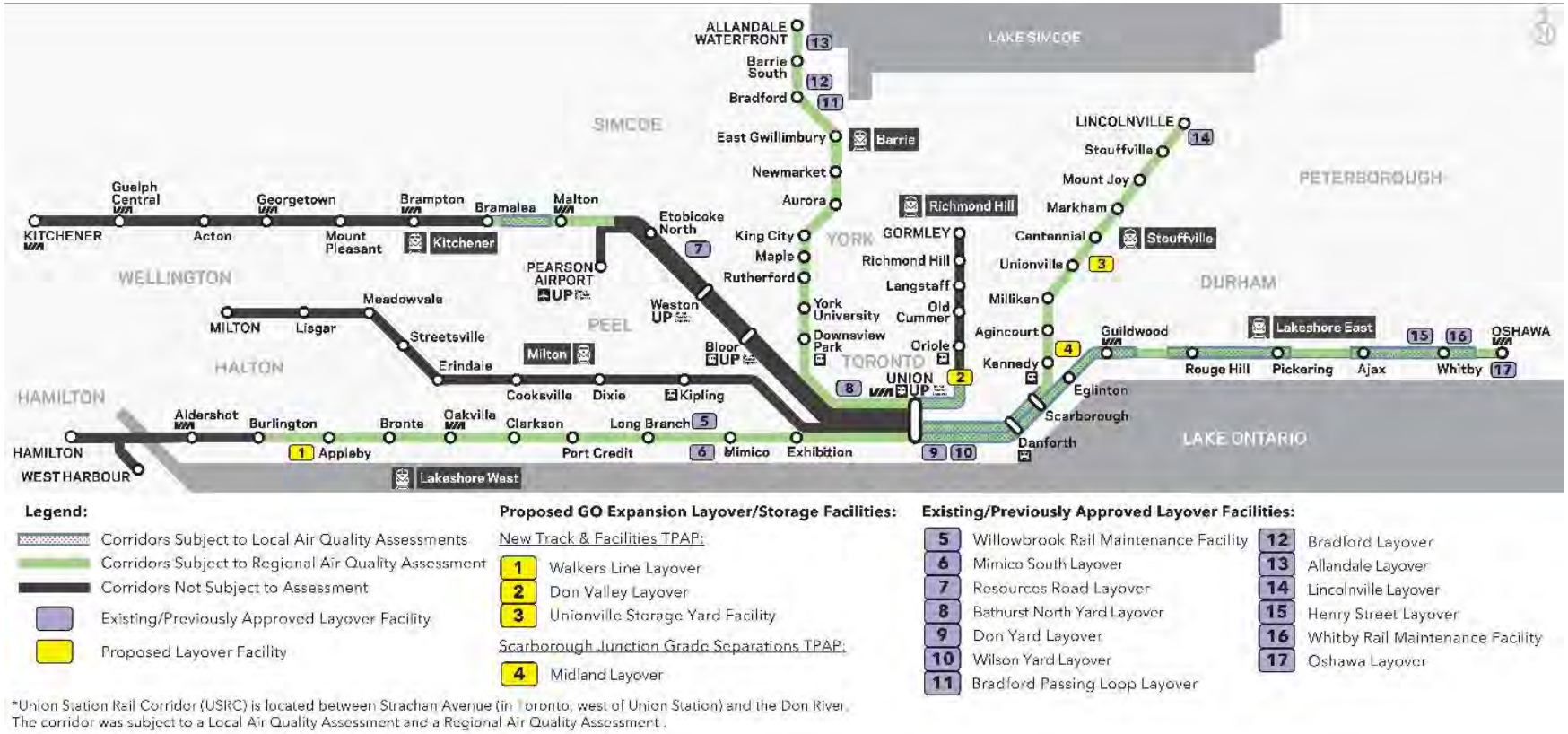

FIGURE 0-4: AIR QUALITY ASSESSMENT STUDY AREAS[6]

[6] *Only some of the GO Expansion program study elements (and proposed infrastructure) are depicted in the map above. Infrastructure already studied in past TPAPs and future planned works including future stations are not included in the map.*

Infrastructure

Design principles and standards identified in the 2017 GO Rail Network Electrification EPR will continue to be adhered to and implemented for the proposed electrification infrastructure. For a complete description of these principles, refer to GO Rail Network Electrification Transit Project Assessment Process Environmental Project Report Volume 1 (Morrison Hershfield and Gannett Fleming, 2017).

Overhead Contact System (OCS) Impact / Vegetation Removal Zone

The OCS is a fundamental component of the traction power distribution system and generally includes the following infrastructure components:

- OCS pole foundations
- Portal/cantilever poles
- Contact, autotransformer, and feeder wires

The OCS consists of a wiring system (i.e., messenger wire and contact wire) that provides efficient transfer of traction power to the pantograph, mounted on the train, and then to electric drive motors. The OCS will be suspended from several steel support structures (i.e., portals and cantilevers) planed along the corridors, including on bridges and overpasses where required.

For purposes of assessing potential impacts as part of the EPR Addendum, a conservative OCS Impact Zone was established that reflects an area spanning the tracks to be electrified plus a five (5) metre offset from the centerline of the outermost track to be electrified on either side of each rail corridor.

A Vegetation Clearing Zone is also required in order to provide safe electrical clearances to any existing vegetation along the rail corridors. The Vegetation Clearing Zone entails vegetation removals within the area encompassed by the OCS plus an additional two (2) metre (m) offset area on either side of the OCS components. As a result, the total clearing area is defined as seven (7) metres measured from the centerline of the outermost tracks to be electrified on either side of each rail corridor.

Layovers/Storage Yards

OCS will be installed over tracks in the layover facilities within the electrified territory. The same design principles applicable to OCS also apply to layover facilities. Three (3) new electrified layover/storage facilities are required to be sited and built at the following locations:

- Walkers Line Layover – Lakeshore West Corridor (proposed as part of NT&F TPAP)
- Unionville Storage Yard – Stouffville Corridor (proposed as part of NT&F TPAP)
- Midland Layover – Lakeshore East Corridor (proposed as part of NT&F TPAP)

Property

Following completion of the 2017 EPR, additional property requirements were identified in association with infrastructure proposed as part of the following TPAPs that were not previously known:

- New Track & Facilities TPAP
- Scarborough Junction Grade Separation TPAP

Notwithstanding this, it is anticipated that the proposed electrification infrastructure (e.g., OCS pole foundations) will be contained within these same property footprint requirements identified for the respective projects listed above, therefore there are no additional property requirements that were identified or assessed within this EPR Addendum pertaining to electrification infrastructure.

In cases where there are “pinch points” and the OCS Impact Zone falls outside of Metrolinx owned ROW, an engineering solution will be developed during detailed design to avoid property impacts, wherever possible. If property impacts are identified during detailed design, Metrolinx will proceed with the acquisition/easement in accordance with Metrolinx’s approved property acquisition process.

With respect to the USRC Hydro One Conflicts, permanent and/or temporary property acquisition will be required for the Don Fleet Junction. Specific property requirements, including those to facilitate construction (i.e., staging/laydown areas) will be confirmed during detailed design. Where access to property is required, Metrolinx will continue to consult with affected landowners as part of future project phases.

Summary of Potential Environmental Effects

The following is a summary of potential effects associated with the proposed project that will require mitigation measures, anticipated specific impacts following mitigation measures, and required commitments for the detailed design process to further refine and develop mitigation measures where necessary. Through the application of the mitigation measures detailed within this document, potential negative impacts associated with the construction and operation of project components will be successfully minimized or mitigated. A comprehensive list of impacts for each corridor segment and specific mitigation measures that will be required are included in Section 4, with a summary of all mitigation measures provided in Section 4.10.

Technical studies prepared as part of or referred to in support of this EPR Addendum are contained in **Appendices A to L.**

Natural Environment

Terrestrial

There will be a direct loss of vegetation where removal of vegetation is required for construction, including a permanent loss of both natural and planted vegetation. A Vegetation Management Plan will be prepared during detailed design, and site specific edge management mitigation measures will be identified. Where vegetation removals are required in public and private lands, Metrolinx has established a Vegetation Compensation framework within the Vegetation Guideline (2020) for Metrolinx undertakings and vegetation that is removed will be compensated for in accordance with the provisions of this framework.

Aquatic

There are no direct impacts to watercourses anticipated to result from OCS installation activities throughout the corridor as all work will be within the existing Metrolinx rail ROW away from the watercourses. Potential indirect effects of the construction works include siltation, introduction of contaminants into the watercourse through the use of industrial equipment, and construction debris. Erosion and sediment controls will be implemented to contain/isolate the construction zones, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment to any watercourses, and an Emergency Preparedness and Response Plan will be developed to govern spill response.

It is noted that there is one (1) watercourse feature within the Walkers Line area along the Lakeshore West Rail Corridor. Potential impacts to aquatic features within the layover site footprint, including OCS infrastructure is addressed within the New Track & Facilities TPAP Natural Environment Impact Assessment Report (Gannett Fleming, 2020).

Species at Risk

The habitat of threatened and endangered species is protected under the *Endangered Species Act*. There is potential for Butternut to occur within the rail corridors and be affected by construction impacts. The presence/absence of Butternuts will be confirmed through tree inventories of impacted areas during detailed design. A health assessment will be undertaken at that time for any pure Butternuts. There is also the potential for Redside Dace habitat to be present; where it does occur, an in-water works timing window of September 16th to June 30th will be adhered to, and the MECP will review and approve all plans for sediment and erosion control measures within the regulated habitat. As part of detailed design, requirements relating to SAR bats will be discussed with the MECP in relation to applicability and preferred approach for any permits/approvals as it relates to the Electrification Project works. Any required MECP permits/approval will be obtained prior to project implementation.

To help identify SAR species that may be found in transit through work areas during construction, on-site training awareness training will be provided to workers and site inspections will be conducted prior to commencing work.

Designated Areas

OCS infrastructure is proposed within the Greenbelt Urban River Valley and Lake Simcoe Protection Plan areas. There are no reasonable alternatives to siting OCS in these areas, given that OCS can only be located within the pre-existing rail corridors, which were located on these lands prior to the adoption of both plans. Mitigation measures developed for terrestrial factors will help mitigate impacts in these areas.

Preliminary Environmental Site Assessment

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required.

A Preliminary Environmental Site Assessment was prepared for new layover facilities and recommendations for further assessment have been identified, where required. A Soil and Excavated Materials Management Plan will be developed for the handling, management and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the work.

Cultural Heritage

A total of thirteen (13) Built Heritage Resources (BHRs) were identified within the revised OCS Impact/Vegetation Clearance Zone Addendum Study Area, all of which are located along the Barrie Corridor. Of the thirteen BHRs, nine (9) are potential BHRs and four (4) are known BHRs. No BHRs or Cultural Heritage Landscapes (CHLs) were identified in the remaining rail corridors of the Electrification Addendum Study Area.

No BHRs are anticipated to be directly impacted as a result of project footprint, construction activities, or operations and maintenance activities. Indirect impacts to ten (10) of the thirteen identified BHRs, are possible due to construction activities associated with OCS infrastructure

and which may result in limited and temporary adverse vibration impacts; baseline vibration monitoring should be undertaken in advance of construction, and construction activities planned accordingly to avoid impacts to the structure on the property.

With respect to the USRC Hydro One Conflicts study area, seven (7) known and potential BHRs and CHLs were identified in the Project Study Area; three (3) BHRs will be both directly and indirectly impacted, and one (1) additional BHR will be subject to indirect impacts only. The two identified CHLs will be neither directly nor indirectly impacted.

Heritage Impact Assessment (HIA) reports were individually prepared for: the Lower Sherbourne Street USRC Bridge, the Parliament Street USRC Bridge, and the Cherry Street USRC Bridge. The purpose of these HIAs was to assess the potential impacts to each of the three (3) USRC Bridges related to the Project and to recommend appropriate mitigation measures to reduce or eliminate impacts while still enabling the addition of the Hydro One utility bridges. Detailed information with respect to proposed mitigation measures and recommendations is presented in Section 4.2.3.3.

Archaeology

The disturbance of potential archaeological resources may occur at the following locations as a result of construction activities: the Walkers Line Layover and the area within a 200 m radius of the Allandale Site (BcGw-69) near Historic Allandale Station and new Allandale Waterfront GO Station along the Barrie Rail Corridor. Stage 2 Archaeological Assessment Studies have been recommended based upon completed Stage 1 Assessments to confirm the presence or absence of resources, for completion during detailed design. Based on the results and recommendations of the completed Stage 2 Archaeological Assessments, any required Stage 3 and/or 4 archaeological assessments will be carried out as required during detailed design. Associated recommendations for avoidance/mitigation will also be complied with.

With respect to the USRC Hydro One Conflict study area, the potential for Stage 2 monitoring has been identified for the Parliament Street to Cherry Street working area if construction reaches a depth of 76m above sea level (ASL). The exact locations and depth of excavation will be confirmed prior to construction of the underground utility corridor.

Land Use and Socio-Economic

Construction activities have the potential to impact sensitive receptors within the vicinity of the study area, including child-care centres, schools, community centres, community landmarks, and long-term care centres. The majority of these impacts will arise from noise and vibration increases, air quality disturbances, or visual changes; as such, these impacts will be managed utilizing the mitigation measures implemented under the Air Quality, Noise, And Visual disciplines. Proper fencing should be erected around all work areas prior to commencement of any earth moving, clearing or construction activities in order to prevent encroachment on adjacent properties.

To minimize impacts to local access and travel patterns, a Construction Management Plan and Traffic Management Plan shall be developed prior to construction and circulated to local municipalities/road authorities for review and discussion.

Air Quality

The potential air quality impacts associated with increased service levels were assessed in those segments of the corridors which are expected to experience an increase in diesel powered equipment activity relative to the 2015 (pre-project or baseline) levels and which have sensitive receptors exposed to the rail corridor (USRC, KIT, and LSE) . The equipment activities include running or idling of GO Transit trains in revenue and non-revenue service along corridors, at stations and in layover or train storage facilities. A regional air quality assessment was also undertaken to assess the impact of future service levels across the entire network.

The assessments entail computer prediction of the emission and atmospheric dispersion of all major diesel train related air pollutants: particulate matter, oxides of nitrogen, carbon monoxide, benzene and benzo(a)pyrene. Predictions are made for a predictable worst-case scenario, which accounts for the planned ultimate train service levels, local meteorological conditions over the most recent 5 years for which data are available, and the 90th percentile of the background concentration of pollutants as measured at the National Air Pollution Surveillance (NAPS) monitoring station nearest to the project site.

The assessment compared the concentrations to objectives that have been established either provincially or nationally. The relevant objectives are the Ontario Ambient Air Quality Criteria (AAQC) and the Canadian Ambient Air Quality Standards (CAAQS). AAQCs represent desirable concentrations of air contaminants. They are commonly used in environmental assessments and are not statutory limits. The CAAQS are used by provinces and territories to guide air zone management actions.

At the regional level, the annual greenhouse gas emissions (CO2eq) range from a slight reduction to an increase above the baseline scenario, depending on the mix of electricity generation sources. At the local level for corridors that will see an increase in diesel traffic, the following pollutants will continue to meet provincial AAQC: CO, NO_2, acrolein, formaldehyde, acetaldehyde, and 1,3- butadiene, which are all byproducts of combustion. Benzene and benzo-a-pyrene may exceed some of the AAQC and NO_2 and $PM_{2.5}$ may exceed some of the Canadian Ambient Air Quality Standards. In many cases, the impacts of the future service levels on concentrations of NO_2, $PM_{2.5}$, benzene, and benzo(a)pyrene are minor compared to background conditions.

Noise and Vibration

Noise

The potential noise impacts of trains and associated equipment and facilities are assessed in all corridors and corridor segments, which are part of the GO Expansion Program. The assessed equipment activities include running or idling of GO Transit trains in revenue and non-revenue service along corridors, at stations and in layover or train storage facilities.

The assessment entails computer prediction of noise impacts during a 16-hour day (7:00 to 23:00) and 8-hour night period (23:00 to 7:00), as required by MECP guidance. Results are produced for a predictable worst-case scenario, which accounts for the planned ultimate train service level as well as train propulsion system (diesel or electric), configuration, and operating condition, and the local topography at each assessed noise sensitive receptor. Modelling is carried out with the most up-to-date modelling algorithm approved by MECP.

In cases where the MECP criteria are exceeded, mitigation in the form of noise walls is considered. The default height of noise walls is 5 metres. In cases where a 5 metre noise wall can reduce noise exposure by a minimum of 5 dBA, it is considered to be acoustically effective. If the 5 dB reduction was not achieved, first a 6 m barrier was considered followed by a 7 m barrier. The next steps in the consideration include an assessment of the constructability of the wall and its economic, operational and administrative feasibility.

The total length of recommended noise walls for each corridor are shown in the table below:

	USRC	Lakeshore West	Kitchener	Barrie	Stouffville	Lakeshore East
2021 Electrification Addendum	0 km	0.5 km	0.76 km	4.4 km	3.7 km	2.2 km

Refer to Section 4, **Appendix G** and **Appendix O** for further details regarding the noise assessment and for maps showing locations of receptors and recommended noise walls.

It is noted that an Enhanced Noise Mitigation Assessment was undertaken as a separate and complementary study to the GO Rail Network Electrification Addendum noise and vibration studies, to examine the potential for additional mitigation along the rail corridors in locations where mitigation was not triggered under the requirements of the Environmental Assessment (EA). The intention is for Metrolinx to consider further noise barriers to protect receptors where absolute noise levels were predicted to be relatively high due to existing rail traffic levels, even if the increase in noise impacts did not meet the (5 dB) threshold for increased noise impacts identified in the updated noise and vibration assessment studies. The additional noise walls recommended as part of the Enhanced Noise Mitigation Assessment are beyond the scope of this EPR Addendum, and as such are not captioned within this document or supporting studies and materials.

Vibration

The assessment of vibration impacts was completed at locations where new tracks and switches are proposed. Where sensitive receptors fall within areas of influence and where operational vibration levels are expected to exceed the MOEE/GO Protocol vibration limits, mitigation is recommended.

Where vibration mitigation is recommended, further evaluation based on administrative, operational, economic and technical feasibility should be completed at the detailed design stage. The recommended vibration mitigation is identified as ballast mats, though consideration of other mitigation options, such as under sleeper pads or resilient fixation can be assessed at the detailed design stage.

Refer to Section 4, **Appendix G** and **Appendix O** for further details regarding the vibration assessment and for maps showing locations of receptors and recommended vibration mitigation for new track and switches.

Visual

Areas of special visual/aesthetic consideration were reviewed along the rail corridors. The installation of OCS infrastructure at new Layover/Storage Yard Facilities have potential to affect views within the surrounding area, particularly where vegetation/tree clearing is required or

where there are no existing obstructions. As part of detailed design, efforts will be made to minimize visual effects as much as possible. This may include the placement and siting of infrastructure in relation to supporting infrastructure such as viaducts, and the development of vegetation compensation in accordance with requirements of the Metrolinx's *Vegetation Guideline* (2020), which will entail offsetting tree loss as much as possible/feasible through planting of trees in other areas and in affected parks wherever possible. As part of operations and maintenance, periodic inspections shall be required for vegetation and infrastructure, and will involve the pruning and replacement of dead plants and the maintenance and repainting of degraded finishes.

With respect to the USRC Hydro One Conflicts study area, the underground transmission corridor is largely located within a designated utilities corridor, therefore there are no visual effects expected that warrant mitigation. The relocation of Hydro One transmission infrastructure using utility bridges, however, is expected to have visual effects on the south views of the Lower Sherbourne Street, Parliament Street and Cherry Street USRC Bridges. Additionally, since Durisol© walls are required to delineate the new and existing Don Fleet JCT from the Lower Don Trail (to ensure public safety), it is anticipated that the new and existing Don Fleet JCT will alter current views experienced by pedestrians along the Lower Don Trail.

Refer to Section 4 for further details regarding recommended mitigation measures for the USRC Hydro One Conflicts.

Utilities

Metrolinx is currently in the process of completing a Due Diligence Exercise which will review new track/upgrade areas to determine utility conflicts. Potential utility conflicts have been identified at the Walkers Line Layover, Midland Layover, and Unionville Storage Yard, located along the Lakeshore West Rail Corridor, Lakeshore East Rail Corridor, and Stouffville Rail Corridor respectively. These conflicts will require confirmation during detailed design. Reservicing of the sites will be required.

Additionally, Metrolinx and Hydro One have identified the need to locate an additional Hydro One transmission structure (i.e., steel monopole) between the Lower Don Valley River and Corktown Common to accommodate clearance requirements for the USRC OCS. A future addendum is to be completed to address environmental assessment requirements; at which time the significance of potential impacts will be determined.

A Utility Infrastructure Relocation Plan shall be developed and implemented that identifies all existing utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. This will include a written workplan and schedule that addresses the work required to the existing utilities in the area of the works. Corridor Crossing Agreements will also be required to define future access and maintenance scopes, and will be updated as required.

Electromagnetic Interference & Electromagnetic Frequencies

The operation of OCS infrastructure has the potential to produce Extremely Low Frequency (ELF) and Electromagnetic Interference (EMI) impacts on sensitive receptors and electronics. An Electromagnetic Compatibility (EMC) Control Plan shall be developed during detailed design to communicate the design and development strategy for EMC general (including both EMI and

EMF) and to catalogue the types of electronics that will be installed. A frequency management plan shall be developed and implemented by the contractor, to capture the operating frequencies at the system engineering level from all intentional emitters in the vicinity of the railway. Additional design mitigations shall be developed to help mitigate the effects of Time-Varying EMFs, Radiated Magnetic Fields, ELF and Electromagnetic Frequencies (EMF), and induced currents in neighbouring metallic structures. Continued consultations will be required with CN, CP, VIA, NAVCAN, and GTAA to satisfy respective requirements.

Post construction measurement and monitoring of the above impacts will be required to ensure mitigation measures have been properly implemented.

Stormwater Management & Drainage

Significant impacts on stormwater quality and drainage patterns are not anticipated to result from the installation of OCS infrastructure, though construction activities have the potential to increase sediment transport into natural drainage areas, watercourses, and municipal drainage infrastructure. Further assessment of the proposed stormwater management features at the Walkers Line Layover, Midland Layover and Unionville Storage Yard will be required during detailed design to ensure that existing storm sewer infrastructure is adequate to handle increases in discharge, and that the stormwater management features proposed for each site are adequate. The Constructor shall prepare and implement a Drainage and Stormwater Report, an Erosion and Sediment Control Plan, detailed drainage design and erosion and sediment control drawings, and shall engage in turbidity monitoring and sampling of runoff where required to ensure compliance with applicable regulations.

Groundwater and Wells

The potential impact on groundwater and wells due to project activities is expected to be imperceptible, due to the relatively shallow foundations of the OCS infrastructure; however, this will be further evaluated at the Detailed Design phase along with the requirement to prepare an Erosion and Sediment Control Plan and/or a Discharge/Mitigation Plan, obtain a PTTW or register the water taking on the EASR. The development of both a Soil and Excavated Materials Management Plan and a Groundwater Management and Dewatering Plan will be required to address the management and disposal of excavated materials and groundwater respectively during construction.

Climate Change & Sustainability

As part of the EPR Addendum, Metrolinx's climate change and sustainability goals were reviewed based on their: overall effectiveness in reducing the Project's impact on climate change (climate change mitigation); and ability to increase the Project's and local ecosystem's resilience to climate change (climate change adaptation), as per the MECP guide for considering climate change in environmental assessments, as well as Metrolinx's Sustainable Design Standard (2020).

Efforts will be made to ensure that climate change mitigation and adaptation and sustainability measures are applied to the maximum extent possible. Metrolinx is continuing to refine its climate change and sustainability requirements and approach and additional sustainability measures specific to GO Expansion Program infrastructure will be incorporated at a future date.

Consultation Process

The objectives for the consultation strategy remained the same as those from the 2017 GO Rail Network Electrification TPAP. In an effort to engage a diverse set of participants, provide information and updates on the project, and to allow opportunities for interested persons to provide comments and feedback throughout the process, the following methods of consultation were employed:

- Online via, Metrolinx Engage;
- Project e-mail addresses (IndigenousRelations@metrolinx.com and GOExpansionTPAP@metrolinx.com) or the appropriate Metrolinx Regional Representative at the following emails:
  - TorontoEast@metrolinx.com (residents east of Don River)
  - TorontoWest@metrolinx.com (residents west of Don River)
  - HaltonRegion@metrolinx.com
  - DurhamRegion@metrolinx.com
  - YorkRegion@metrolinx.com
  - Peel@metrolinx.com
  - SimcoeCounty@metrolinx.com
- Public Open Houses and Public Review Opportunities;
- Newspaper Advertisements;
- Notifications and Email Updates;
- Meetings with Review Agencies (Federal, Provincial, Municipal and Conservation Authorities);
- Meetings with Elected Officials;
- Notifications to Indigenous Nations & organizations;
- Meetings with Other Stakeholders (e.g., transit authorities, utilities); and
- Notifications to Property Owners.

In order to more efficiently present information on multiple, interrelated aspects of the GO Expansion Program, and so that interested persons could participate in combined meeting sessions, consultation activities for the Significant Addendum to the Electrification TPAP were undertaken in combination with the rest of the GO Expansion Program.

Metrolinx hosted a total of four rounds of public meetings occurring over multiple dates. Only the first round of meetings were held in person, with the remainder hosted virtually on Metrolinx Engage (i.e. virtual open houses). Newspaper advertisements for Public Meeting – Round 1 were published in local newspapers and online publications with distribution in vicinity of the corridors, as well as online. Notices were also distributed to those on the Stakeholder Contact List in advance of the Public Meetings, and to property owners within 100 m of the study area as part of Public Meeting – Round 1 and Round 3.

A total of ten (10) Public Meetings were held during Public Meeting Round #1, between February 18 and February 29, 2020, at locations spread around the GTHA. The meetings

provided the public an opportunity to review display boards and meet with staff one on one to discuss the project. Comment sheets were collected both during and after the meetings to gather feedback from participants and answer questions.

Metrolinx hosted the second round of public consultation for the GO Expansion Program online from August 18 to September 1, 2020. In the second round of consultation Metrolinx introduced new proposed infrastructure, presented potential impacts and mitigation, and continued to seek feedback on potential impacts and proposed new infrastructure as part of the GO Expansion Program, particularly for the three TPAPS: (1) New Tracks & Facilities, (2) Scarborough Junction Grade Separation, and (3) Stouffville Rail Corridor Grade Separations. The information presented at the second round of consultation for the GO Rail Network Electrification Addendum was limited to a description of key preliminary design and construction commitments, along with updates on the project schedule.

Metrolinx hosted the third round of public consultation for the GO Expansion Program online from November 27 to December 11, 2020. In the third round of consultation, Metrolinx presented the draft environmental and technical study findings and provided updates on outstanding study results for the three (3) TPAPs (New Track and Facilities TPAP, Scarborough Junction Grade Separation TPAP, Stouffville Rail Corridor Grade Separations TPAP) and the two (2) addenda projects (the Network-Wide Structures Project [an Addendum to the Barrie Rail Corridor Expansion TPAP 2017], and the Addendum to the GO Rail Network Electrification TPAP 2017); sought public feedback on the proposed mitigation measures, recommendations, and other advice for implementation for each of the projects; and introduced the Union Station Trainshed – Heritage Conservation project.

Metrolinx hosted a fourth round of public consultation online from February 2 to February 11, 2021 to provide additional information regarding the proposed scope of work within the Union Station Rail Corridor (USRC) associated with the Hydro One Conflicts, including upgrades to the existing and new Don Fleet Junction.

A Consultation Report, including consultation materials developed/presented, as well as correspondence and feedback/comments received from review agencies, Indigenous Nations & organizations, the public and other stakeholders has been provided as **Appendix M**.

Commitments to Future Work

O. Reg 231/08 requires future commitments, including required permits and approvals, to be documented as part of the TPAP to facilitate project implementation in accordance with project-specific mitigation measures and monitoring activities described in the Significant Addendum to the GO Rail Network Electrification TPAP and in a manner that does not result in negative impact on matters of provincial interest related to the natural or socio-economic environment, including areas of cultural heritage value or interest, or on constitutionally protected Indigenous or treaty rights.

In recognition of the fact that there could be changes to the project design/description following its TPAP completion during detail design and/or construction, Metrolinx will comply with O. Reg. 231/08 for reviewing any changes to the project following completion of the Significant Addendum to the GO Rail Network Electrification TPAP. Metrolinx will therefore review any changes to the project design/description and determine whether the change constitutes either an Insignificant Change or a Significant Change. If the significance of the change is determined to be not significant/negligible, in accordance with *O. Reg. 231/08*, Metrolinx will document the rationale for this decision and keep a record of the EPR addendum/change documentation in the project file, and may proceed without the filing of A Notice of Environmental Project Report

Addendum. If the significance of the change to the project is deemed to result in an increased potential adverse effect, then it would be categorized as a change that will require the publishing of a Notice of Environmental Project Report Addendum, as per *O. Reg. 231/08*, along with all other requirements herein.

All applicable permits, approvals, and monitoring requirements under environmental laws will be reviewed, confirmed, and obtained by Metrolinx prior to construction of the project.

1 Introduction

1.1 Study Purpose

On December 11, 2017, the Minister of the Environment and Climate Change (now referred to as Minister of the Environment, Conservation and Parks) issued a Notice to Proceed to Metrolinx and Hydro One (as Co-Proponents) for the GO Rail Network Electrification Environmental Project Report (EPR) to convert six GO owned rail corridors from diesel to electric propulsion. Metrolinx subsequently issued a Statement of Completion for the GO Rail Network Electrification Transit Project Assessment Process on December 15, 2017.

The purpose of this EPR Addendum is to document and assess the potential environmental impacts of changes to the project design associated with new/upgraded tracks, new layover facilities (which are the subject of separate TPAPs – refer to Section 1.2.1 below), additional infrastructure required within the Union Station Rail Corridor (USRC) and surrounding areas to address identified conflicts with existing Hydro One transmission infrastructure and revisions required to update the noise and vibration study that have occurred since the completion of the 2017 GO Rail Network Electrification EPR. These changes are further summarized in Section 1.4 below.

1.2 Study Background

The population of the Greater Toronto Hamilton Area (GTHA) is increasing, and with it, traffic congestion. Metrolinx is committed to improving the GO Transit system to bring 15-minute, two-way electrified service to core parts of the rail network (see **Figure 1-1**) through the GO Expansion program (previously referred to as Regional Express Rail [RER]). The GO Expansion program will transform the existing GO Rail Network into a world class rail system and is set to become one of the biggest transit infrastructure builds in Canada. It is part of ongoing provincial investments in public transit that includes Light Rail Transit (LRT), subway, and bus projects across the GTHA. Upon delivery, the GO Expansion program will transform the GO Rail Network from a commuter focused rail system to the backbone of the GTHA's Rapid Transit Network. These improvements will expand the GO Rail network to new markets which will enable seamless travel across the region. The program consists of many different projects. The largest piece represents all the work that is required to enable service levels identified in the GO Expansion Full Business Case, including new trains, signals, systems, track, as well as the maintenance and operation of the system for years to come.

It is through this program that Metrolinx is proposing to convert several rail corridors within the GO Transit network from diesel to electric propulsion. Metrolinx and Hydro One (as co-proponents) jointly carried out a Transit Project Assessment Process (TPAP) in 2017 in accordance with *Ontario Regulation 231/08 - Transit Projects and Metrolinx Undertakings*. An Environmental Project Report was prepared detailing the undertaking, which included design and implementation of traction power supply and traction power distribution components (including an Overhead Contact System [OCS]) along the electrified rail corridors, electrical feeder routes, as well as a number of electrical power supply/distribution facilities (referred to as Traction Power Facilities) located in the vicinity of the rail corridors.

FIGURE 1-1: GO TRANSIT NETWORK

1.2.1 Overview of GO Expansion TPAPs

As part of GO Expansion, Metrolinx is already starting to transform the existing GO rail system from a commuter service to a whole new rapid transit experience. To this end, Metrolinx is undertaking several Transit Project Assessment Processes (TPAPs) and EPR Addendums in accordance with *Ontario Regulation 231/08 - Transit Projects and Metrolinx Undertakings* for various new infrastructure requirements including but not limited to: new tracks, new layover and/or storage facilities, grade separations, structures modifications, as follows:

- New Track & Facilities TPAP
- Scarborough Junction Grade Separation TPAP
- Network Wide Structures Project (an Addendum to the Barrie Rail Corridor Expansion TPAP 2017)
- Stouffville Rail Corridor Grade Separations TPAP

The study areas associated with these projects are situated along various rail corridors within the GO Transit Network including the Union Station, Lakeshore West, Kitchener, Barrie, Stouffville, Lakeshore East, and Richmond Hill Rail Corridors.

Table 1-1 provides a summary of the planned infrastructure associated with each TPAP/EPR Addendum, the status of each project, relevant Metrolinx rail corridor(s), and relevance to this EPR Addendum.

TABLE 1-1: GO EXPANSION TPAP/EPR ADDENDA AND RELEVANCE TO 2021 GO RAIL NETWORK ELECTRIFCATION EPR ADDENDUM

TPAP or EPR Addendum	Status of TPAP/Addendum Process	Scope of Infrastructure	Metrolinx Rail Corridor(s)	Relevance to 2021 GO Rail Network Electrification EPR Addendum
New Track & Facilities TPAP	Notice of Completion issued December 29, 2020.	Proposed infrastructure along various rail corridors that will enable Metrolinx to deliver the planned increased service levels, including: • New track and upgrades to existing tracks (various corridors); • Retaining walls (various corridors); • Switches (various corridors); • GO Station platforms; • Don Valley Layover (Richmond Hill Corridor), Walkers Line Layover (Lakeshore West Corridor) and Unionville Storage Yard (Stouffville Corridor); • Thickson Road Bridge Expansion (Lakeshore East corridor); and • Electrification of the Richmond Hill rail corridor from the southern limits of the rail corridor near Eastern Avenue north to approximately Pottery Road, within the City of Toronto.	• Lakeshore West Rail Corridor; • Kitchener Rail Corridor; • Barrie Rail Corridor; • Stouffville Rail Corridor; • Lakeshore East Rail Corridor; and • Richmond Hill Rail Corridor.	• Updated project description within 2021 EPR Addendum reflects Revised OCS & Vegetation/Tree Removal Zones along each relevant rail corridor & associated impact assessment • Proposed infrastructure considered within the updated GO Expansion train service levels/operating scenario used to carry out the revised Noise, Vibration and Air Quality Studies, as documented within this 2021 EPR Addendum.
Scarborough Junction Grade Separation TPAP	Notice of Completion issued December 21, 2020.	As part of eliminating potential conflicts with opposing and express trains, Metrolinx is proposing to construct a grade separation between the Stouffville Corridor and Lakeshore East Corridor at the Scarborough Junction. The Scarborough Junction Grade Separation TPAP includes the following infrastructure components:	• Stouffville Rail Corridor; and • Lakeshore East Rail Corridor.	• Updated project description within 2021 EPR Addendum reflects Revised OCS & Vegetation/Tree Removal Zones along each relevant rail corridor & associated impact assessment • Proposed infrastructure considered within the updated GO Expansion train service levels/operating

TPAP or EPR Addendum	Status of TPAP/Addendum Process	Scope of Infrastructure	Metrolinx Rail Corridor(s)	Relevance to 2021 GO Rail Network Electrification EPR Addendum
		• Midland Layover (Lakeshore East Corridor); • Rail/rail grade separation of the new Stouffville connection under the Lakeshore East tracks at Scarborough Junction; • Depressed rail corridor from St. Clair Avenue East Bridge to Corvette Park; • Depressed rail grade separation at Danforth Road to maintain Danforth Road at the existing grade; • Multi-use crossing, including the construction of an overpass bridge or tunnel option to replace the existing at-grade pedestrian crossing at Corvette Park; • New bridge structure over St. Clair Avenue East to carry the Stouffville north track; • New alignment of the Lakeshore East tracks at Scarborough Junction; • Construction of retaining walls in areas where there is a significant change of grade; • Construction of protective barriers in areas of electrification infrastructure; and • Modification or relocation of the Scarborough GO Station building to accommodate additional track.		scenario used to carry out the revised Noise, Vibration and Air Quality Studies, as documented within this 2021 EPR Addendum.
Network Wide Structures Project (Addenda to the Barrie Rail Corridor Expansion TPAP 2017)	Pre-Planning phase. Anticipate Statement of Completion in 2021.	Through the Network-Wide Structures Project, road-rail grade separations are proposed[7], including: • Wellington Street East Grade Separation, Town of Aurora; and	• Barrie Rail Corridor.	• No significant changes identified with respect to OCS & Vegetation/Tree Removal Zones included in 2017 EPR. • Proposed infrastructure considered within the updated GO Expansion

[7] It is noted that the scope of the Network Wide Structures Project was under review at time of writing this EPR Addendum and may be subject to future changes.

TPAP or EPR Addendum	Status of TPAP/Addendum Process	Scope of Infrastructure	Metrolinx Rail Corridor(s)	Relevance to 2021 GO Rail Network Electrification EPR Addendum
		• McNaughton Road Grade Separation, City of Vaughan.		train service levels/operating scenario used to carry out the revised Noise, Vibration and Air Quality Studies, as documented within this 2021 EPR Addendum.
Stouffville Rail Corridor Grade Separations TPAP	Notice of Completion issued January 5, 2021.	This project includes proposed modifications required to meet the service goals of the GO Expansion program and reduce the number of road and at-grade rail crossings along the Stouffville Rail Corridor. The proposed grade separation locations are as follows: • Denison Street, City of Markham: Road Under Rail • Kennedy Road, City of Markham: Road Under Rail • McNicoll Avenue, City of Toronto: Road Under Rail • Huntingwood Drive, City of Toronto: Road Under Rail • Havendale Road, City of Toronto: Road Closure with Multi-Use Crossing • Progress Avenue, City of Toronto: Road Over Rail	• Stouffville Rail Corridor.	• No significant changes identified with respect to OCS & Vegetation/Tree Removal Zones included in 2017 EPR. • Proposed infrastructure considered within the updated GO Expansion train service levels/operating scenario used to carry out the revised Noise, Vibration and Air Quality Studies, as documented within this 2021 EPR Addendum.

1.3 EPR Addendum Process

As per *Section 15(1), Ontario Regulation 231/08,* any change that is inconsistent with a previously approved EPR requires a reassessment of the effects associated with the project, the identification of potentially new mitigation measures, and potentially new monitoring systems in an Addendum to the previously approved EPR.

The following are the key steps in the EPR Addendum process:

- Prepare an assessment of the effects the proposed change may have on the environment.
- Prepare and distribute an EPR Addendum.
- Prepare and distribute a Notice of Environmental Project Report Addendum.
- Review by the public and stakeholders prior to proceeding with the proposed Addendum.

In addition to the required key steps listed above, in order to enhance the planning process for this project, Metrolinx voluntarily conducted additional consultation, including three (3) rounds of public meetings that were executed as part of the GO Expansion engagement efforts, as described in Section 5. For all changes to the project that are inconsistent with the EPR, the Proponent shall prepare an addendum to the EPR that contains the following information:

- A description of the proposed change (refer to Section 1 and Section 2)
- The reason for the proposed change (refer to Section 1 and Section 2)
- An assessment and evaluation of any impacts that the proposed change might have on the environment (refer to Section 4)
- A description of any proposed measures for mitigating any negative impacts that the proposed Project might have on the environment (refer to Section 4)
- A statement of whether the proponent is of the opinion that the proposed change is significant (or not), and reason for the opinion (refer to Section 1.4.4).

Figure 1-2 illustrates the EPR Addendum process.

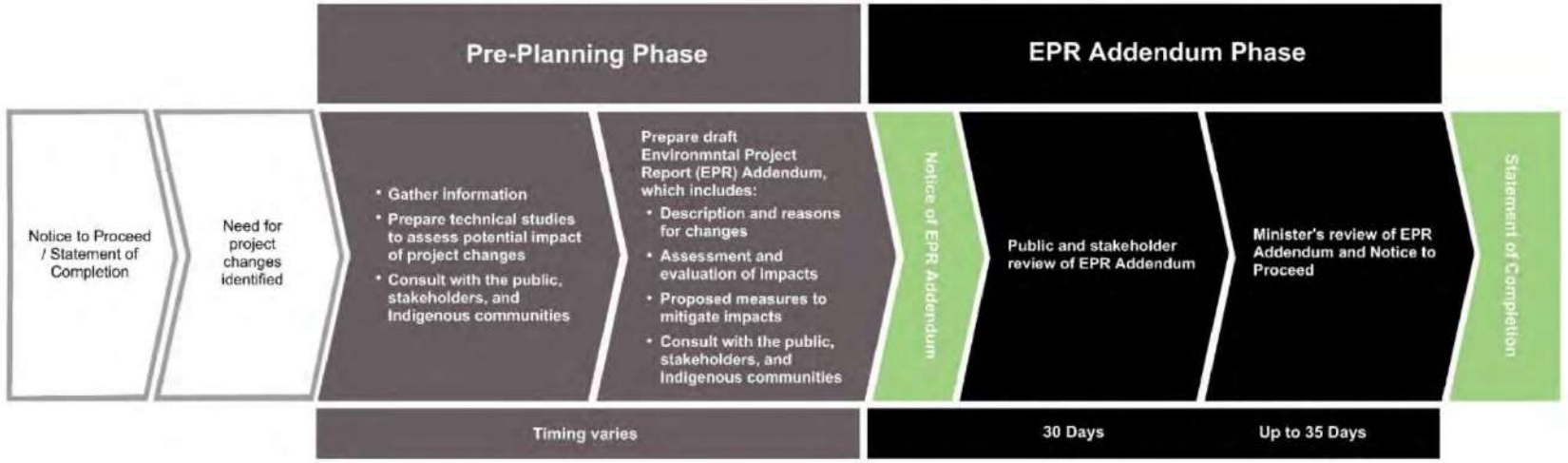

FIGURE 1-2: EPR ADDENDUM PROCESS

1.4 Summary of Proposed Design Changes

This GO Rail Network Electrification EPR Addendum addresses the following changes to the previously approved 2017 EPR:

1.4.1 Revised OCS Impact/Vegetation Clearance Zones

Changes to the base case scenario[8] primarily consisting of: new or modified track infrastructure along railway rights-of-way (ROWs), new layover/storage facilities along select rail corridors, and new grade separations along select rail corridors that constitute revised OCS Impact/Vegetation Clearance Zones along the rail corridors to be electrified.

The differences between the OCS Impact/Vegetation Clearance Zones as defined in the 2017 EPR, and the revised limits of these zones as assessed within this 2021 EPR Addendum are depicted in the mapping contained in **Appendix N** (refer to Section 2 for further detail).

1.4.2 Changes to Proposed Infrastructure within Union Station Rail Corridor

Following the 2017 EPR, Metrolinx has undertaken additional review and analysis, in coordination with Hydro One, to confirm locations within and along the USRC where the proposed electrification infrastructure is in conflict with existing overhead Hydro One infrastructure. Therefore, to eliminate these conflicts, additional engineering design has been undertaken to identify solutions for relocating Hydro One transmission infrastructure. In order to ensure that potential environmental impacts of these relocations/solutions are evaluated, these proposed works are being assessed as part of this 2021 EPR Addendum. Specifically, this entails relocating Hydro One transmission infrastructure in the vicinity of the USRC from approximately Mile 0.72E (just east of Henry Lane Terrace) to Mile 1.72E (just west of the Don River Valley), including the following elements:

- Relocating Hydro One transmission infrastructure using utility bridges adjacent to the Lower Sherbourne Street USRC Bridge (Subway)[9], Parliament Street USRC Bridge (Subway) and Cherry Street USRC Bridge (Subway)[10].
- Relocating two (2) overhead circuits and one (1) underground circuit to a new underground transmission corridor from the Esplanade Transmission Station (TS) to the Don Fleet Junction (JCT).
    - An underground transmission corridor is proposed to accommodate a spare circuit. The relocated corridor will be designed to contain up to four (4) transmission cables utilizing a combination of surface troughs, cable banks and utility bridges.
- Replacement of three (3) existing potheads, and replacement/extension of existing chain link fence with Durisol© wall to capture existing Hydro One Tower #9 at the existing Don Fleet JCT (located on the east side of the Lower Don Trail).
- Removal of existing Hydro One Tower #10A, installation of two (2) new BPEX structures[11], overhead connection of two (2) circuits from BPEX structures to existing

[8] The Base Case Scenario was documented in Volume 1, Section 3.2 of the 2017 GO Rail Network Electrification EPR.
[9] Utility bridge at Lower Sherbourne Street will be attached to the future expanded bridge, as approved in 2018 under the USRC East Enhancements Environmental Project Report.
[10] Proposed utility bridges are anticipated to be a truss structure clad in either horizontal or vertical fins, regardless of which treatment options are applied.
[11] Each BPEX structure will contain three (3) new potheads.

Hydro One Tower 9, and installation of Durisol© wall at the new Don Fleet JCT (located on the west side of the Lower Don Trail).

Additionally, Metrolinx and Hydro One have identified the need to locate an additional Hydro One transmission structure (i.e., steel monopole) between the Lower Don Valley River and Corktown Common to accommodate clearance requirements for the USRC Overhead Catenary System (OCS). A future addendum is to be completed to address environmental assessment requirements; at which time the significance of potential impacts will be determined.

1.4.3 Revised GO Expansion Service Level Plan

Changes to the anticipated GO Expansion service levels (compared to those previously assessed in 2017) have been identified, which constitute the need for revised noise, vibration and air quality impact assessment studies. The revised service levels and operating scenario are generally described as follows (refer to Section 2 for further detail).

The new GO Expansion Service Plan[12] (also referred to as the *Ultimate Capacity Train Service Schedule*) anticipates the following ultimate weekday train trips per day:

- Union Station Rail Corridor – 703
- Lakeshore West - 267
- Kitchener – 164
- Barrie Rail – 245
- Stouffville – 351
- Lakeshore East – 251

Future demand will be met with new electric rolling stock and existing diesel trains in the following configurations:

- Electric locomotive powered 12- car (peak period) and 6-car (off-peak period) trains;
- Diesel locomotive powered 12-car (peak period) and 6-car (off-peak period) trains; and
- Electric Multiple Units (EMU) with 1 to 4 units. EMUs are self-powered electric cars that are not pulled or pushed by locomotives.

According to the service plan, some locations will be served by electric trains (Metrolinx-owned rail lines), some by a mix of electric and diesel trains (rail corridors with joint ownership), and others by only diesel trains (rail lines not owned by Metrolinx). Refer to **Figure 1-3** for a reference map.

[12] The service plan is based on current forecasts of future demand for express rail service and is subject to revision.

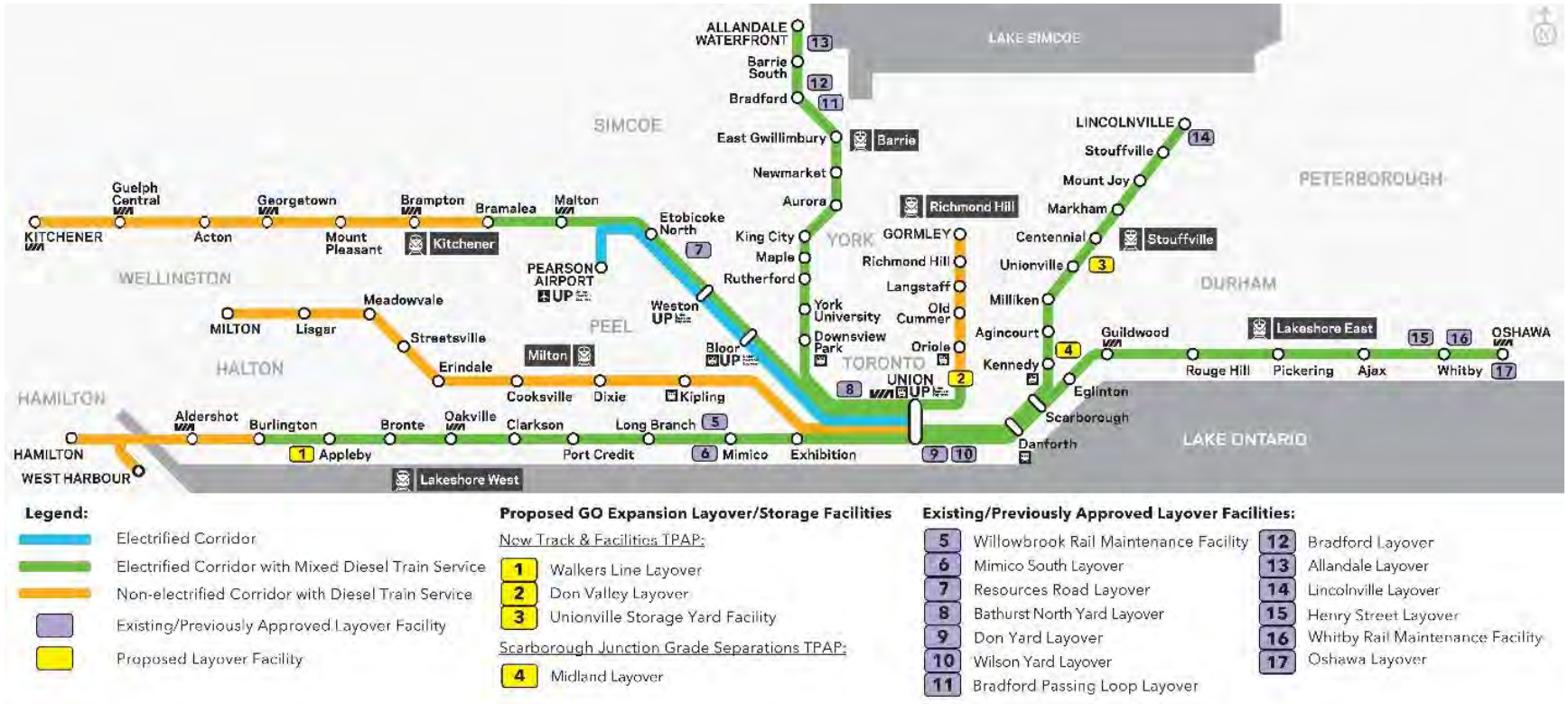

FIGURE 1-3: FUTURE TRAIN SERVICE TYPE AND ELECTRIFED CORRIDORS[13]

[13] Only some of the GO Expansion program study elements (and proposed infrastructure) are depicted in the map above. Infrastructure already studied in past TPAPs and future planned works including future stations are not included in the map.

Accordingly, the scope of this EPR Addendum is as follows:

- To provide an assessment of the potential environmental impacts (and required mitigation/monitoring) associated with the revised OCS Impact/Vegetation Clearance Zones, which are the zones of influence within which electrification infrastructure is proposed.
- To provide an assessment of the infrastructure, and determine mitigation for, changes proposed within the vicinity of the Union Station Rail Corridor between Mile 0.72E and 1.72E where proposed electrification infrastructure is in conflict with Hydro One overhead transmission line infrastructure.
- To document the revised noise, vibration and air quality study results associated with updated GO Expansion service levels, including proposed mitigation and monitoring measures.

1.4.4 Significance of the Proposed Changes

In accordance with *Section 15 of O. Reg. 231/08*, Metrolinx assessed the significance of the proposed changes to the GO Rail Network Electrification Project that are inconsistent with the approved 2017 EPR. Based on this assessment, Metrolinx determined that the changes are considered *significant* for the following reasons:

- The potential environmental effects and proposed mitigation/monitoring measures associated with the revised OCS Impact/Vegetation Clearance Zones (along each rail corridor to be electrified) require review and updates in order to reflect the latest GO Expansion infrastructure plans;
- The proposed utility bridges required at the Lower Sherbourne Street USRC Bridge (Subway), Parliament Street USRC Bridge (Subway) and Cherry Street USRC Bridge (Subway) related to eliminating Hydro One conflicts necessitate the preparation of Heritage Impact Assessment (HIA) studies, as these structures were identified by Metrolinx as Provincial Heritage Properties (PHP) under the *Ontario Heritage Act,* section 25.2; and
- The assumed train service levels were significantly revised since the 2017 EPR to align with the currently proposed GO Expansion service levels; therefore a fulsome update of the noise, vibration, and air quality impact assessment studies is required in order to ensure that potential effects are articulated accurately and that mitigation and monitoring measures are reviewed and updated accordingly.

1.4.5 Study Areas

1.4.5.1 Revised OCS Impact/Vegetation Clearance Zone Study Areas

The Revised OCS Impact/Vegetation Clearance Zone Study Areas that were examined as part of this EPR Addendum are generally described as follows and are illustrated in **Figure 1-4**.

1. Revised OCS Impact/Vegetation Clearance Zone along the Union Station Rail Corridor (USRC) – From UP Express Union Station to Don Yard Layover;
2. Revised OCS Impact/Vegetation Clearance Zone Lakeshore West Corridor – from immediately west of Bathurst Street (Mile 1.20) to Burlington;

3. Revised OCS Impact/Vegetation Clearance Zone Kitchener Corridor – from UP Express Spur[14] (at Highway 427) to Bramalea;
4. Revised OCS Impact/Vegetation Clearance Zone Barrie Corridor – from Parkdale Junction (off Kitchener Corridor) to Allandale Waterfront GO Station;
5. Revised OCS Impact/Vegetation Clearance Zone Stouffville Corridor – from Scarborough Junction (off Lakeshore East Corridor) to Lincolnville GO Station; and
6. Revised OCS Impact/Vegetation Clearance Zone Lakeshore East Corridor – from Don Yard Layover to Oshawa GO Station

[14] The portion of the Kitchener corridor from Strachan Ave. to the airport spur (at Highway 427) was previously assessed/approved as part of the Metrolinx UP Express Electrification TPAP.

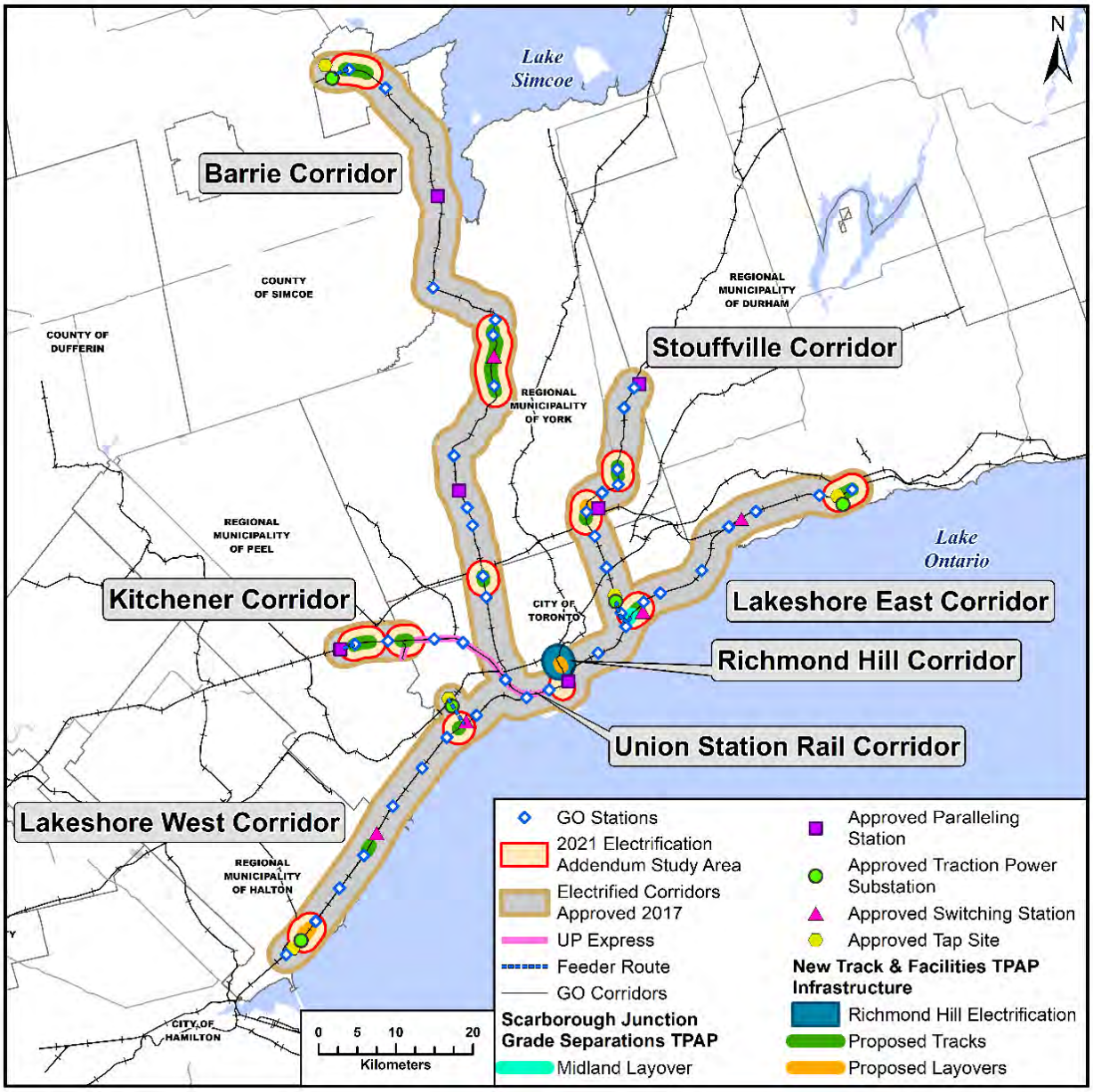

FIGURE 1-4: REVISED OCS IMPACT/VEGETATION CLEARANCE ZONE STUDY AREAS – 2021 ELECTRIFICATION EPR ADDENDUM

1.4.5.2 USRC Hydro One Conflicts Study Areas

The USRC Hydro One Conflicts Study Areas extends from approximately Mile 0.72E (just east of Henry Lane Terrace) to Mile 1.72E (just west of the Don River Valley), along the Union Station Rail Corridor in the City of Toronto, and include the following elements/locations (see **Figure 1-5**):

- Lower Sherbourne Street Bridge (Subway);
- Parliament Street Bridge (Subway);
- Cherry Street Bridge (Subway);
- Esplanade Transmission Station;
- Don Fleet Junction (JCT) (including new and existing sites adjacent to Lower Don Trail); and
- Portion of the Corktown Common, where future steel monopole is proposed that will be studied under a separate addendum.

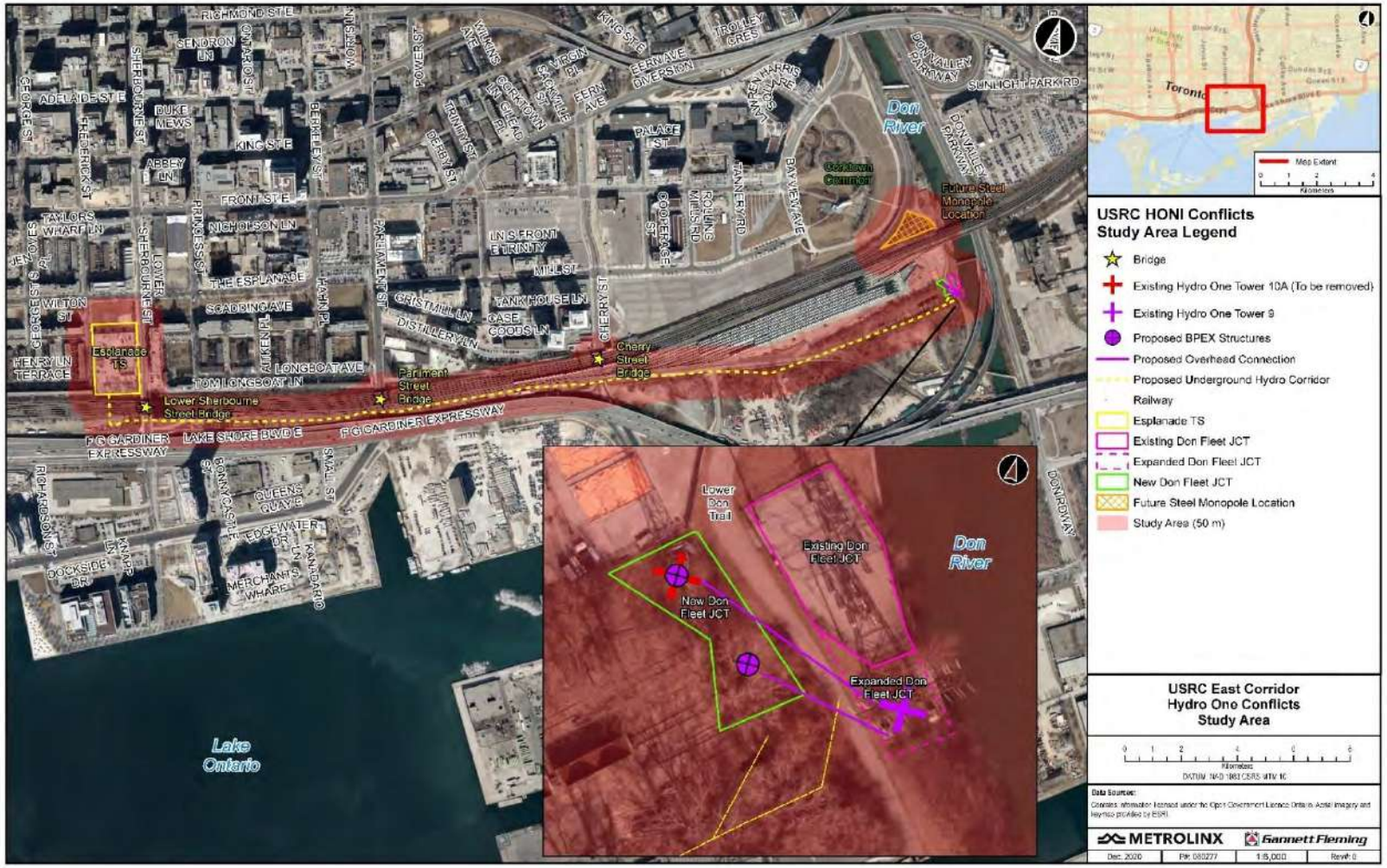

FIGURE 1-5: USRC HYDRO ONE CONFLICTS STUDY AREAS15

[15] Metrolinx and Hydro One have identified the need to locate an additional Hydro One transmission structure (i.e., steel monopole) between the Lower Don Valley River and Corktown Common to accommodate clearance requirements for the USRC Overhead Catenary System (OCS). A future addendum is to be completed to address environmental assessment requirements for this structure; at which time the significance of potential impacts will be determined.

1.4.5.3 Study Areas Associated with Noise, Vibration Studies

The updated Noise and Vibration Assessment included studies for the following Metrolinx-owned rail corridors includes:

- Union Station Rail Corridor – From Union Station to Cherry Street;
- Lakeshore West Rail Corridor – From Strachan Avenue to approximately 1 km west of Burlington GO Station;
- Kitchener Rail Corridor – From the UP Express Pearson International Airport Spur to Bramalea GO Station;
- Barrie Rail Corridor - From Parkdale Junction (off Kitchener Corridor) to Allandale Waterfront GO Station;
- Stouffville Rail Corridor – From Scarborough Junction north to Lincolnville GO Station; and
- Lakeshore East Rail Corridor – From just east of the Don River to Oshawa GO Station.

Noise modelling impacts for portions of the USRC (between Cherry Street and the Don River) and the LSE corridor (between the Don River and Carlaw Avenue) within the Ontario Line Joint Corridor have been assessed and documented separately as part of the Ontario Line TPAP. It is also noted that a noise and vibration assessment was undertaken for the Richmond Hill Corridor and associated impacts have been documented as part of the New Track & Facilities TPAP.

Refer to **Figure 1-6** for an illustration of the Noise and Vibrations Assessment study areas.

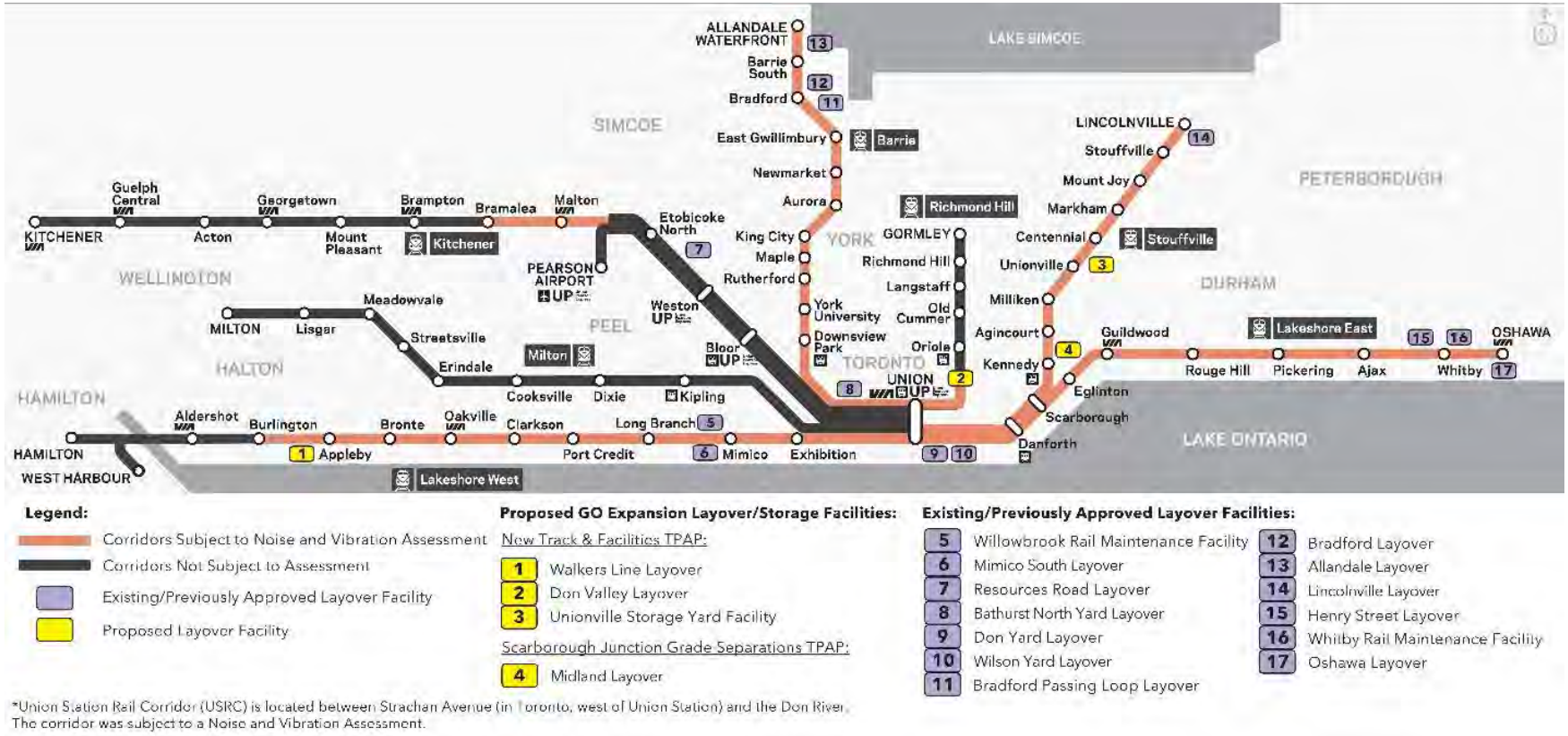

FIGURE 1-6: NOISE AND VIBRATION ASSESSMENT STUDY AREAS [16]

[16] *Only some of the GO Expansion program study elements (and proposed infrastructure) are depicted in the map above. Infrastructure already studied in past TPAPs and future planned works including future stations are not included in the map.*

1.4.5.4 Study Areas Associated with Air Quality Studies

The Air Quality Assessment Update includes a network-wide "regional" assessment and three area-specific "local" assessments. The Regional Air Quality Study[17] scope and study area includes six Metrolinx-owned rail corridors including:

- Union Station Rail Corridor – From Union Station to Cherry Street;
- Lakeshore West Rail Corridor (including the Canpa Subdivision) – From Strachan Avenue to approximately 1 km west of Burlington GO station;
- Kitchener Rail Corridor – From the UP Express Pearson International Airport Spur to Bramalea GO Station;
- Barrie Rail Corridor – From Parkdale Junction (off Kitchener Corridor) to Allandale Waterfront GO Station;
- Stouffville Rail Corridor – From Scarborough Junction north to Lincolnville GO Station; and
- Lakeshore East Rail Corridor – From just east of the Don River to Oshawa GO Station.

As part of the Local Air Quality Assessments, Metrolinx looked at the local ambient air pollutant concentrations on three electrified corridors where diesel train service is expected to increase, including:

- Union Station Rail Corridor – from Union Station for approximately 1.7 km to the east to Cherry Street;
- Kitchener Rail Corridor – from east of Malton GO Station for approximately 800 m to the west; and
- Lakeshore East Rail Corridor[18] – From the Don River east to Whitby Rail Maintenance Facility[19]; and

For all other corridors, increased service levels will be achieved by adding electrified trains and diesel train traffic levels will either remain the same or decrease in the future. As such, local air quality assessments were not required. It is noted that a local air quality assessment was undertaken for the Richmond Hill Corridor and associated impacts have been documented as part of the New Track & Facilities TPAP.

Refer to **Figure 1-7** for an illustration of the Regional Air Quality and Local Air Quality Assessment study areas.

[17] The assessment of the Richmond Hill corridor is included within the NT&F TPAP

[18] Due to the long length of the Lakeshore East Corridor, the study area was divided into four study segments.

[19] Referred to as East Rail Maintenance Facility (ERMF) within the 2017 GO Rail Network Electrification EPR.

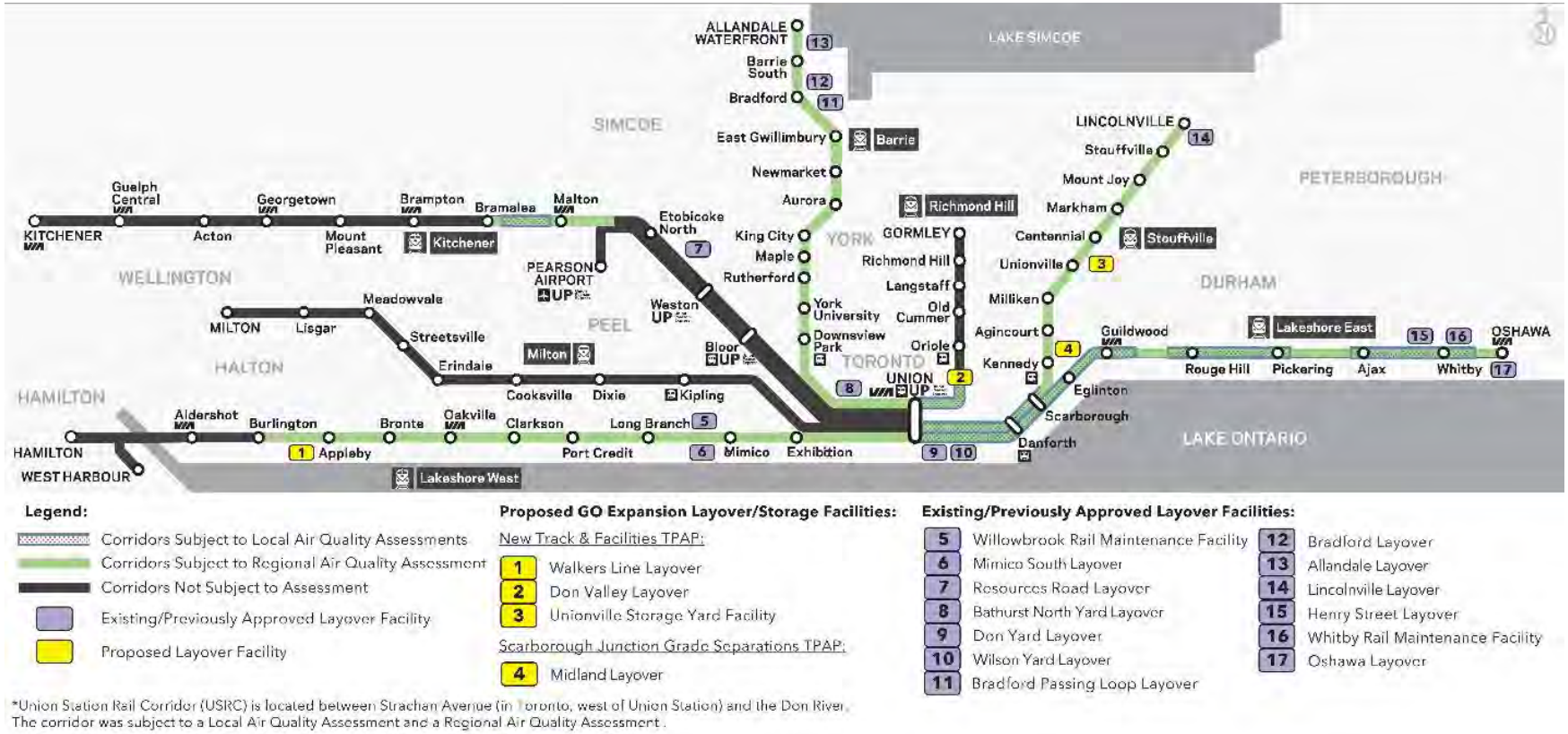

FIGURE 1-7: AIR QUALITY ASSESSMENT STUDY AREAS[20]

[20] Only some of the GO Expansion program study elements (and proposed infrastructure) are depicted in the map above. Infrastructure already studied in past TPAPs and future planned works including future stations are not included in the map.

1.5 EPR Addendum Organization

The following provides a brief overview of the contents found within each section of the EPR Addendum and supporting technical reports (included as Appendices).

- **Section 1** – describes the study background, purpose, rationale for the changes, and regulatory context.
- **Section 2** – provides the updated project description and overview of the study area (including map).
- **Section 3** – provides a description of the updated baseline (existing) environmental conditions within the study area.
- **Section 4** – describes the updated assessment of potential environmental impacts, including updated noise, vibration and air quality impacts, as well as recommended mitigation and monitoring measures associated with implementation of the Project.
- **Section 5** – describes the consultation process and activities that were undertaken as part of the GO Rail Network Electrification EPR Addendum. This section also provides an overview of the input/comments/feedback received from various stakeholders and how they were considered by Metrolinx (i.e., Review Agencies, Indigenous Nations & organizations, the Public, Property Owners, etc.).
- **Section 6** – describes the proposed additional and/or updated commitments to future work, and outlines the additional anticipated approvals and permits required for implementing the Project.

2 Update to Detailed Project Description

The purpose of this Section is to describe design changes to the Project since the completion of the 2017 GO Rail Network Electrification EPR.

2.1 Design Principles

Design principles and standards identified in the 2017 GO Rail Network Electrification EPR will continue to be adhered to and implemented for the proposed electrification infrastructure. For a complete description of these principles, refer to GO Rail Network Electrification Transit Project Assessment Process Environmental Project Report Volume 1 (Morrison Hershfield and Gannett Fleming, 2017).

The following sections provide a brief summary of the Overhead Contact System (OCS) and Vegetation Clearance Zone requirements for contextual purposes.

2.1.1 Overhead Contact System (OCS)

The OCS is a fundamental component of the traction power distribution system and generally includes the following infrastructure components:

- OCS pole foundations
- Portal/cantilever poles
- Contact, autotransformer, and feeder wires

The OCS consists of a wiring system (i.e., messenger wire and contact wire) that provides efficient transfer of traction power to the pantograph, mounted on the train, and then to electric drive motors. The OCS configuration is generally dependent on a combination of factors including train speed, wire size, system height (i.e., maximum space between contact wire and messenger wire), climatic conditions, the height of the wire above the track, and track alignment.

The OCS will be suspended from several steel support structures (i.e., portals and cantilevers) planed along the corridors, including on bridges and overpasses where required[21]. Generally, the number of tracks to be spanned dictates the type of structure required (i.e. portals are typically used when spanning three or more tracks, whereas cantilevers are used when two or less tracks are spanned).

Furthermore, OCS attachments to third party property along the corridors is not anticipated based on the conceptual design. Notwithstanding this, the need for any attachments will need to be verified during detailed design based on the established track configurations.

2.1.1.1 OCS Impact & Vegetation Clearing Zone

A conservative OCS Impact Zone was established that reflects an area spanning the tracks to be electrified (including tracks associated with proposed layover and storage facilities) plus a five (5) metre offset from the centerline of the outermost track to be electrified on either side of each rail corridor.

[21] No additional bridge modifications beyond what was assessed as part of the 2017 GO Rail Network Electrification TPAP are proposed as part of this TPAP Addendum.

A Vegetation Clearing Zone is required in order to provide safe electrical clearances to any existing vegetation along the rail corridors. The Vegetation Clearing Zone entails vegetation removals within the area encompassed by the OCS plus an additional two (2) metre (m) offset area on either side of the OCS components. As a result, the total clearing area is defined as seven (7) metres measured from the centerline of the outermost tracks to be electrified on either side of each rail corridor.

Vegetation clearing is required to:

- Minimize the risk of tree limbs falling on the track or overhead wires, thus potentially causing a conflict with the electrified system resulting in loss of service and revenue.
- Accommodate a mandatory clearance zone to ensure maintenance workers are safe when working in an electrified environment.

The project will comply with the European standard EN50122-1:211+A1:2011 (E) Paragraph 5.2.6: Railway Applications - Fixed installations. This European Standard specifies requirements for the protective provisions relating to electrical safety in fixed installations associated with alternating current (AC) traction systems and to any installations that can be endangered by the traction power supply system.

The seven (7) metre vegetation clearing zone is made up of (see **Figure 2-1):**

- 2.9 m clearance from the track to the OCS pole to ensure clearance of the train to the OCS pole.
- 2.5 m vegetation clearance from the electrical components to the limits of the trees.
- Up to 1.6 m to account for tree grow back (regrowth zone).

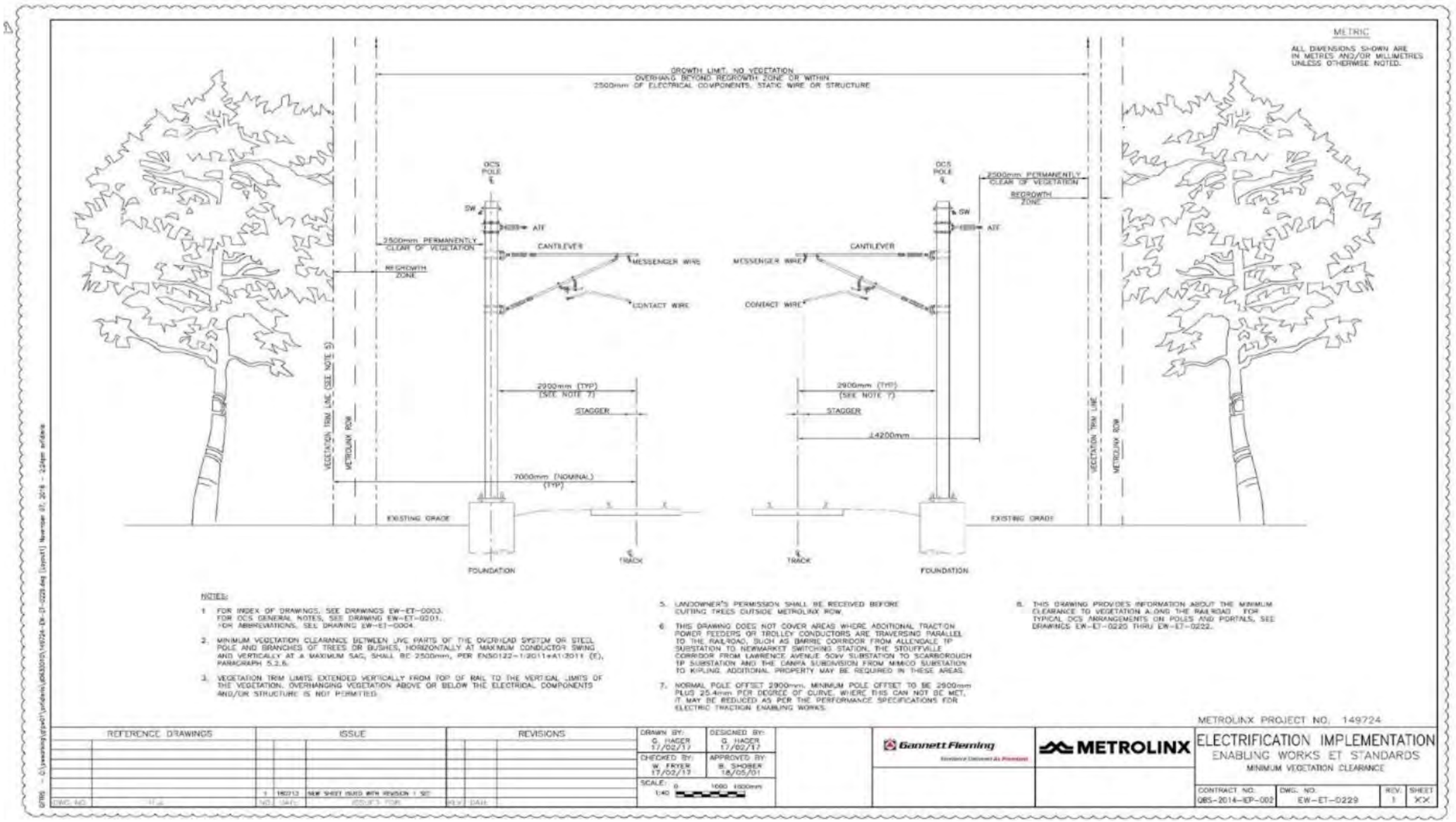

Figure 2-1: OCS Impact and Vegetation Clearing Zone

2.2 Revised OCS Impact/Vegetation Clearance Zones

Since the 2017 EPR, Metrolinx has undertaken additional studies and engineering design to identify the additional infrastructure required to meet targeted GO Expansion service levels that have resulted in changes to the limits of the previously defined seven (7) metre OCS Impact/Vegetation Clearance Zones as previously established as part of the GO Rail Network Electrification TPAP. These new infrastructure requirements include but are not limited to: new or modified track infrastructure along railway ROWs, new layover and/or storage facilities along select rail corridors, along select rail corridors that constitute revised OCS Impact/Vegetation Clearance Zone limits along rail corridors to be electrified.

The revised limits of the OCS Impact/Vegetation Clearance Zone assessed as part of this EPR Addendum relied on the proposed project infrastructure footprints (including property requirements) defined through the following TPAPs:

- New Track & Facilities (NT&F) TPAP
- Scarborough Junction Grade Separation (SJGS) TPAP

2.2.1 Property Requirements

Based on the conceptual design developed and documented in the 2017 EPR, the OCS pole foundations can generally be accommodated within Metrolinx owned rail ROW, and no property impacts were anticipated due to the placement of OCS infrastructure along the corridors.

Following completion of the 2017 EPR, additional property requirements were identified in association with infrastructure proposed as part of the following TPAPs that were not previously known:

- New Track & Facilities TPAP
- Scarborough Junction Grade Separation TPAP

Notwithstanding this, it is anticipated that the proposed electrification infrastructure (e.g., OCS pole foundations) will be contained within these same property footprint requirements identified for the respective projects listed above, therefore there are no additional property requirements that were identified or assessed within this EPR Addendum pertaining to electrification infrastructure.

In cases where there are “pinch points” and the OCS Impact Zone falls outside of Metrolinx owned ROW, an engineering solution will be developed during detailed design to avoid property impacts, wherever possible. If property impacts are identified during detailed design, Metrolinx will proceed with the acquisition/easement in accordance with Metrolinx’s approved property acquisition process.

With respect to the USRC Hydro One Conflicts, permanent and/or temporary property acquisition will be required for the Don Fleet Junction. Specific property requirements, including those to facilitate construction (i.e., staging/laydown areas) will be confirmed during detailed design. Where access to property is required, Metrolinx will continue to consult with affected landowners as part of future project phases.

2.2.2 Construction Methods – OCS Infrastructure

There are no changes to the proposed construction methods or typical construction activities associated with the installation of OCS infrastructure as presented in the GO Rail Network Electrification Transit Project Assessment Process EPR Volume 1.

2.2.3 Mapping Overlay Assessment

A mapping overlay exercise was completed utilizing Geographic Information Systems (GIS) software and relying on the conceptual design information for the infrastructure proposed from the aforementioned TPAP projects to establish the revised limits of the seven (7) metre OCS Impact/Vegetation Clearance Zones in the applicable areas along each affected rail corridor. Accordingly, updated Conceptual Electrification Corridor Plans were generated that present the study area examined as part of this Addendum (refer to **Appendix N)**.

In addition, the tables provided in the sections that follow present a summary of the new infrastructure proposed as part of the relevant TPAP projects (i.e., NT&F TPAP, SJGS TPAP) along each rail corridor along with a determination of where an evaluation of potential impacts was required as part of this EPR Addendum. It should be noted that the corridor specific study areas for each corridor are divided into sections with their proposed infrastructure and the associated **Appendix N** figures (maps) provided for ease of reference.

2.2.4 Union Station Rail Corridor

2017 EPR

As part of the GO Rail Network Electrification EPR, the Union Station Rail Corridor (USRC) electrification limits were defined as: beginning at UP Express Union Station Mile Point (MP) 0.00 and continuing east to the Don Yard Layover at MP 1.65 on the USRC subdivision. A conceptual design was prepared that consisted of all tracks in the USRC being electrified. A freight route will be maintained through USRC and the design will include the provision for a route for Double-Stacked Freight.

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A number of relocations/solutions have been proposed as part of this EPR Addendum to eliminate conflicts between electrification infrastructure and existing overhead Hydro One infrastructure (see Section 2.3 below for further detail). Therefore, a review and assessment of potential impacts from an electrification perspective is required and is summarized in **Table 2-2** below. The locations of these features are shown in detail in **Figure 1-5**.

TABLE 2-1: SUMMARY OF USRC EPR ADDENDUM STUDY AREA AND RESPECTIVE MAP REFERENCES

Electrification Corridor Segment	Proposed New Infrastructure included in USRC Hydro One Conflicts Assessment / Study Area Segment	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N) – 2021 EPR Addendum
USRC-2	Relocating Hydro One transmission infrastructure using a utility bridge adjacent to the Lower Sherbourne Street USRC Bridge (Subway). Relocating two (2) overhead circuits, one (1) underground circuit, and one (1) new circuit to a new underground transmission corridor from the Esplanade Transmission	New infrastructure does not result in a revised 7m OCS Impact/Vegetation Removal Zone.	USRC-2 to USRC-4

Electrification Corridor Segment	Proposed New Infrastructure included in USRC Hydro One Conflicts Assessment / Study Area Segment	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N) – 2021 EPR Addendum
	Station (TS) to the Don Fleet Junction (JCT).		
USRC-3	Relocating Hydro One transmission infrastructure using utility bridge adjacent to the Parliament Street USRC Bridge (Subway) and Cherry Street USRC Bridge (Subway). Relocating two (2) overhead circuits, one (1) underground circuit, and one (1) new circuit to a new underground transmission corridor from the Esplanade Transmission Station (TS) to the Don Fleet Junction (JCT).	New infrastructure does not result in a revised 7m OCS Impact/Vegetation Removal Zone.	USRC-3 to USRC-4
USRC-3	Relocating two (2) overhead circuits, one (1) underground circuit, and one (1) new circuit to a new underground transmission corridor from the Esplanade Transmission Station (TS) to the Don Fleet Junction (JCT). Replacement of three (3) existing potheads, and replacement/extension of existing chain link fence with Durisol© wall to capture existing Hydro One Tower #9 at the existing Don Fleet JCT. Removal of existing Hydro One Tower #10A, installation of two (2) new BPEX structures , overhead connection of two (2) circuits from BPEX structures to existing Hydro One Tower 9, and installation of Durisol© wall at the new Don Fleet JCT. Metrolinx and Hydro One have identified the need to locate an additional Hydro One transmission structure	New infrastructure does not result in a revised 7m OCS Impact/Vegetation Removal Zone.	USRC-4

Electrification Corridor Segment	Proposed New Infrastructure included in USRC Hydro One Conflicts Assessment / Study Area Segment	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N) – 2021 EPR Addendum
	(i.e., steel monopole) between the Lower Don Valley River and Corktown Common to accommodate clearance requirements for the USRC Overhead Catenary System (OCS)[22].		

It should be noted that since the 2017 EPR, vegetation documented has now largely been removed due to the Gardiner Rehabilitation and Port Lands Flood Protection projects.

2.2.5 Lakeshore West Rail Corridor

2017 EPR

As part of the 2017 GO Rail Network Electrification EPR, the Lakeshore West Corridor electrification limits were defined as: beginning at Mile 1.20 and continuing west to Burlington GO Station Mile 31.5 on the Oakville subdivision. A conceptual design was prepared as part of the 2017 TPAP that consisted of five tracks[23] from sta. 10+900 (Mile 6.7) to 51+000 (Mile 31.7) at Burlington GO Station and which also incorporated the existing GO stations at: Exhibition, Mimico, Long Branch, Port Credit, Clarkson, Oakville, Bronte, Appleby and Burlington.

2021 EPR Addendum

A number of track upgrades and one (1) new layover facility (to be electrified) have been proposed as part of the NT&F TPAP. Therefore, a review and assessment of potential impacts from an electrification perspective is required and is summarized in **Table 2-2** below. The locations of these features, along with previously approved electrification infrastructure, are shown in detail in **Figure 2-2**.

TABLE 2-2: SUMMARY OF LAKESHORE WEST CORRIDOR EPR ADDENDUM STUDY AREA AND RESPECTIVE MAP REFERENCES

Electrification Corridor Segment	Proposed New Infrastructure included in New Track and Facilities TPAP / Study Area Segment	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N) – 2021 EPR Addendum
LSW-2	Track Segment LSW-1: Track upgrade from Mile 2.45 to 2.60 (Canpa subdivision)	New track infrastructure falls outside 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	LSW-16 to LSW-17

[22] A future addendum is to be completed to address environmental assessment requirements; at which time the significance of potential impacts will be determined.
[23] For the purposes of the TPAP, five (5) tracks were assumed for this section for ultimate build out, however for RER expansion over the next 30 years, four (4) tracks are proposed.

Electrification Corridor Segment	Proposed New Infrastructure included in New Track and Facilities TPAP / Study Area Segment	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N) – 2021 EPR Addendum
LSW-5	Track Segment LSW-2 & LSW-3: Track upgrade from Mile 20.44 to 20.80 Track upgrade from Mile 20.58 to 20.88	New track infrastructure does not result in a revised 7m OCS Impact/Vegetation Removal Zone.	--
LSW-8	Track Segment LSW-4 & LSW-5: Walkers Line Layover from Mile 28.65 to 29.48	New track infrastructure falls outside 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	LSW-71 to LSW-74

FIGURE 2-2: LAKESHORE WEST – EPR ADDENDUM CORRIDOR KEY PLAN

2.2.6 Kitchener Rail Corridor

2017 EPR

As part of the 2017 GO Rail Network Electrification EPR, the Kitchener Corridor electrification limits were defined as beginning at the limits of the Union Pearson (UP) Express Spur (just west of Highway 427)[24] located at Mile 13.48 on the Weston subdivision and continuing west to Bramalea on the Halton subdivision. A conceptual design was prepared as part of the 2017 TPAP that consisted of three tracks from sta. 21.500 (Mile 13.4) to 26+200 (Mile 16.3), two tracks from sta.26+200 (Mile 16.3) to 28+700 (Mile 12), and a third turn back track at Bramalea Station and which incorporated the existing GO stations at Malton and Bramalea.

2021 EPR Addendum

A number of new tracks and track upgrades have been proposed as part of the NT&F TPAP. Therefore, a review and assessment of potential impacts from an electrification perspective is required and is summarized in **Table 2-3** below. The locations of these features, along with previously approved electrification infrastructure, are shown in detail in **Figure 2-3.**

TABLE 2-3: SUMMARY OF KITCHENER CORRIDOR EPR ADDENDUM STUDY AREA AND RESPECTIVE MAP REFERENCES

Electrification Corridor Segment	Proposed New Infrastructure included in New Track and Facilities TPAP/Study Area Segment	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N) – 2021 EPR Addendum
KT-1	Track Segment KT-1 & KT-2: Track upgrade from Mile 13.19 to 13.69. Track upgrade from Mile 13.19 to 13.64. Track upgrade from Mile 13.35 to 13.70.	Portions of the new track infrastructure (south side and north side mile 13.4 to 13.7) fall outside of the 2017 Electrification TPAP study area and results in a revised 7m OCS Impact/Vegetation Removal Zone. Mile 13.4 Eastward - *Outside 2017 Electrification TPAP scope. To be addressed via separate EPR Addendum to 2014 UP Express Electrification EPR, if required*	KT-1

[24] Excluding Highway 427 bridges that were previous assessed under the UP Express Electrification TPAP (Metrolinx, 2014).

Electrification Corridor Segment	Proposed New Infrastructure included in New Track and Facilities TPAP/Study Area Segment	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N) – 2021 EPR Addendum
KT-2	Track Segment KT-3: Track upgrade from Mile 16.20 to 16.39 Track upgrade from Mile 16.20 to 16.39.	Portions of new track infrastructure (north side ~mile 16.24 to 16.36) falls outside of 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone. Portions of the new track infrastructure (south side mile 16.2 to 16.39) falls outside of 2017 Electrification TPAP study area and results in a revised 7m OCS Impact/Vegetation Removal Zone.	KT-6 to KT-7
	Track Segment KT-4: Track upgrade from Mile 16.46 to 11.54 Track upgrade from Mile 16.52 to 11.56.	Portions of the new track infrastructure (south side ~mile 16.46 to 16.7 and ~mile 16.8 to 11.16) falls outside of 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	KT-7 to KT-9
	Track Segment KT-4: New track from Mile 16.50 to 11.11	Portions of the new track infrastructure (north side mile 11.1 to 16.5) falls outside of 2017 Electrification TPAP study area and results in a revised 7m OCS Impact/Vegetation Removal Zone.	KT-7 to KT-9
	Track Segment KT-5: New track from Mile 11.39 to 11.75	Portions of new track infrastructure (south side mile 11.39 to 11.75) falls outside of 2017 Electrification TPAP study area and results in a revised 7m OCS Impact/Vegetation Removal Zone.	KT-8 to KT-9

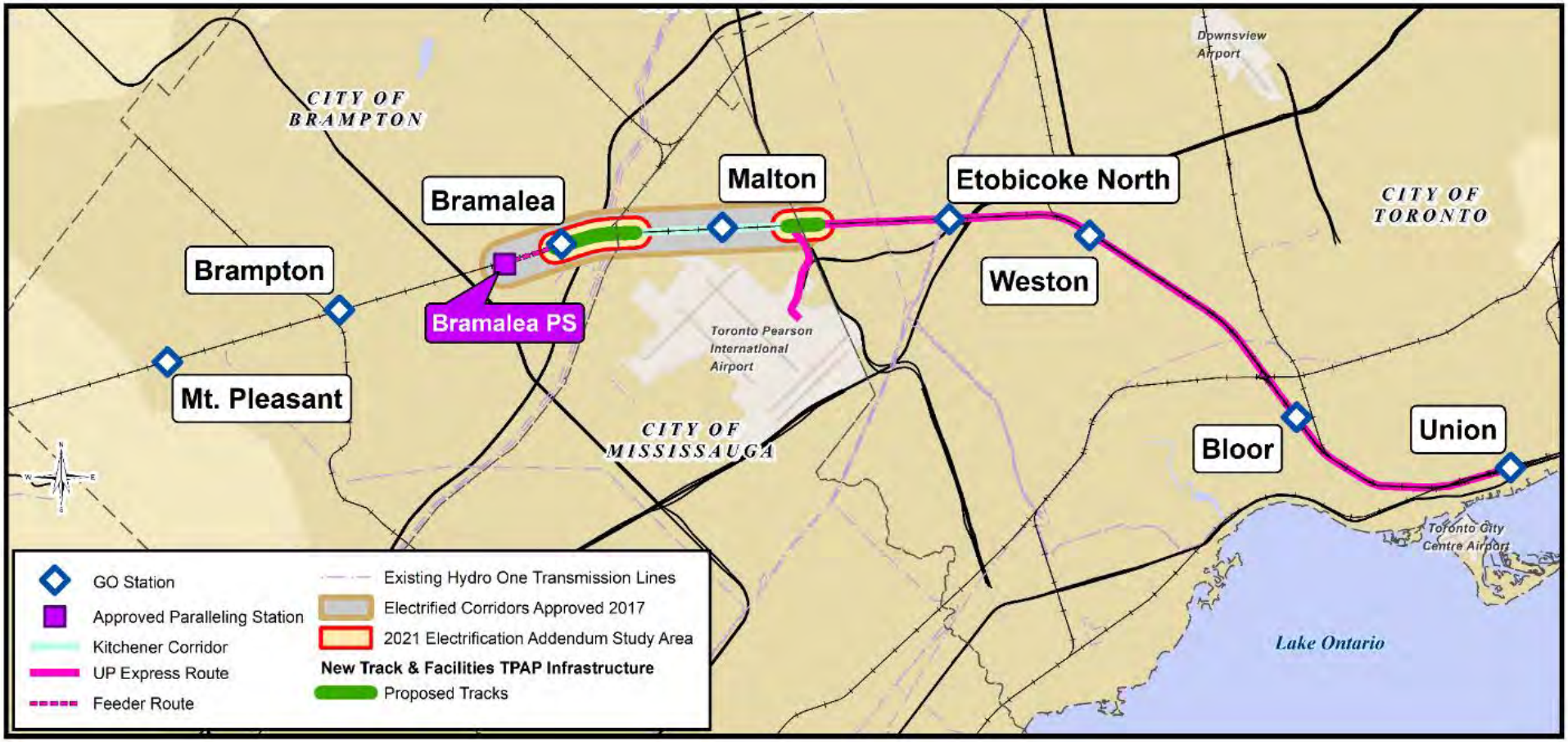

FIGURE 2-3: KITCHENER – EPR ADDENDUM CORRIDOR KEY PLAN

2.2.7 Barrie Rail Corridor

2017 EPR

As part of the GO Rail Network Electrification EPR, the Barrie Corridor electrification limits were defined as: beginning at the limits of the Parkdale Junction (off Kitchener Corridor) at Mile 3.0 and continuing north to Allandale Waterfront GO Station Mile 63.00 on the Newmarket subdivision. A conceptual design was prepared as part of the 2017 TPAP that consisted of two tracks from sta. 4+900 (Mile 3.0) to sta.101+500 (Mile 63.0). The conceptual design also incorporated the existing GO stations at: Rutherford, Maple, King City, Aurora, Newmarket, East Gwillimbury, Bradford, Barrie South and Allandale. The design incorporated the provision of two future GO Stations at: Caledonia and Downsview Park (Downsview Park GO Station has since opened in December, 2017).

2021 EPR Addendum

A number of new tracks and track upgrades have been proposed as part of the NT&F TPAP. Therefore, a review and assessment of potential impacts from an electrification perspective is required and is summarized in **Table 2-4** below. The locations of these features, along with previously approved electrification infrastructure, are shown in detail in **Figure 2-4.**

TABLE 2-4: SUMMARY OF BARRIE CORRIDOR EPR ADDENDUM STUDY AREA AND RESPECTIVE MAP REFERENCES

Electrification Corridor Segment	Proposed New Infrastructure included in New Track and Facilities TPAP/ Study Area Segment	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N) – 2021 EPR Addendum
BR-3	Track Segment BR-1: New track from Mile 12.19 to 12.53.	Portion of the new track infrastructure (west side ~ mile 12.19 to 12.53) falls outside of 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	BR-31 to BR-32
BR-6	Track Segment BR-2: Track upgrade from Mile 29.50 to 29.60.	Portions of the new track infrastructure (east side mile 29.50 to 29.60) falls outside of 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	BR-83
BR-7	Track Segment BR-2 & BR-3: New track from Mile 29.54 to 34.62	Portion of the new track infrastructure (west side ~mile 30.25 to 30.76, ~mile 31.56 to 31.67, ~mile 32.07 to 32.12, ~mile 32.68 to mile 32.73, ~mile 33.23 to mile 33.40, ~mile 33.59 to 34.05, ~mile 34.17 to mile 34.42, ~mile 34.38 to mile 34.52) falls outside of 2017 Electrification TPAP study area; which results in a revised 7m	BR-85 to BR-87, BR-90 to BR-99

Electrification Corridor Segment	Proposed New Infrastructure included in New Track and Facilities TPAP/ Study Area Segment	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N) – 2021 EPR Addendum
		OCS Impact/Vegetation Removal Zone.	
	Track Segment BR-2 & BR-3: Track upgrade from Mile 29.96 to 30.29	New track infrastructure does not result in a revised 7m OCS Impact/Vegetation Removal Zone.	BR-85
BR-12	Track Segment BR-13 & BR-16: New track from Mile 61.40 to 63.40	Portion of 7m vegetation zone for the new infrastructure (west side ~mile 61.41 to mile 61.88, ~mile 61.97 to mile 62.45 ~mile 62.65 to mile 62.76, ~mile 63.06 to mile 63.16 and ~mile 63.24 to mile 63.26) falls outside of 2017 Electrification TPAP study area ~Mile 62.08 to mile 62.42 track is outside of 2017 Electrification TPAP study area; which results in a revised 7m OCS Impact/Vegetation Removal Zone.	BR-173 to BR-177

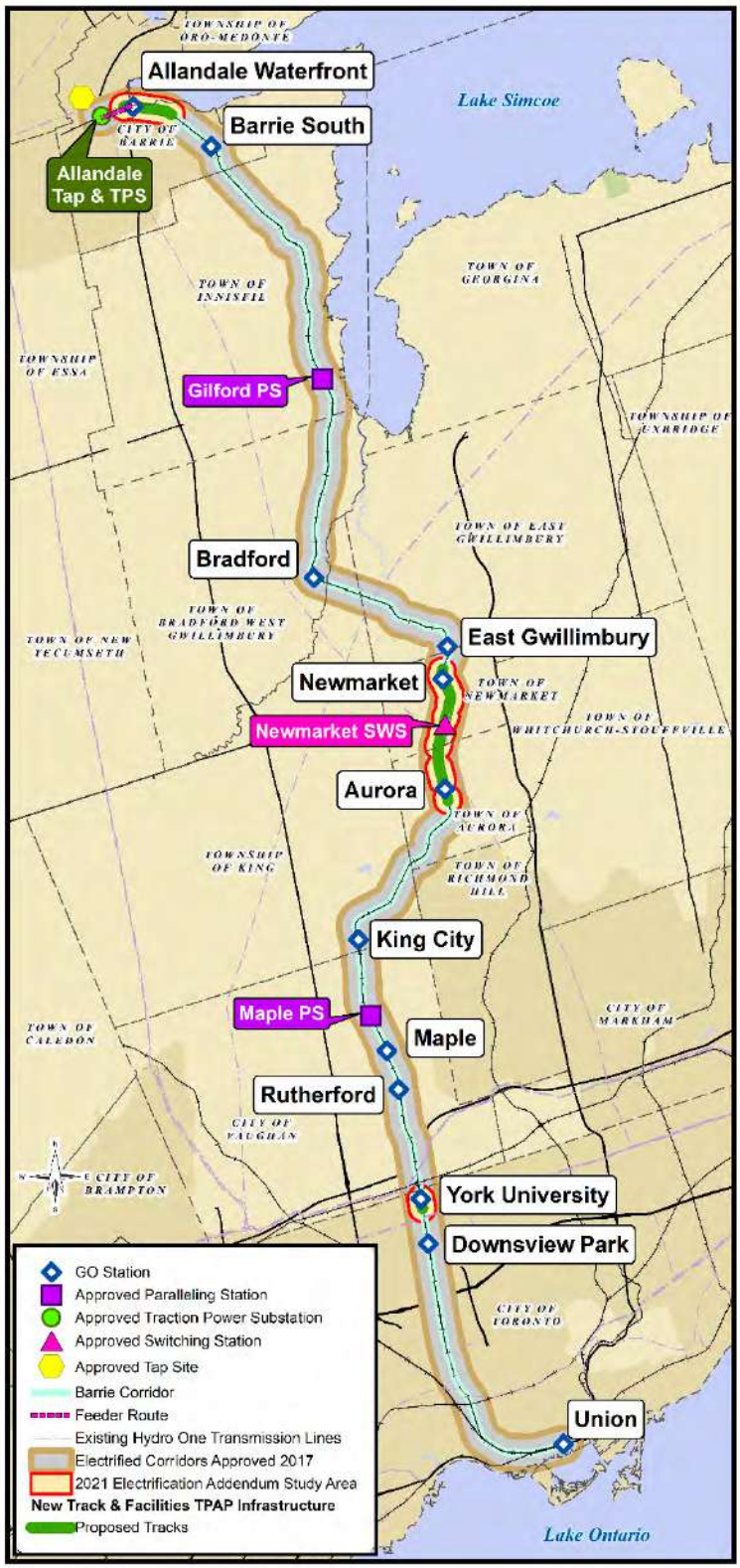

FIGURE 2-4: BARRIE – EPR ADDENDUM CORRIDOR KEY PLAN

2.2.8 Stouffville Rail Corridor

2017 EPR

As part of the GO Rail Network Electrification EPR, the Stouffville Corridor electrification limits were defined as: beginning at the limits of the Scarborough Junction (off Lakeshore East Corridor) located at Mile 60.67 and continuing north to Lincolnville Station Mile 38.9 on the Uxbridge subdivision. A conceptual design was prepared as part of the 2017 TPAP that consisted of two tracks from sta.14+000 (Mile 60.5) to 30+300 (Mile 50.4), and a single track from sta. 30+300 (Mile 50.4) to Lincolnville Station. The conceptual design also incorporated the existing GO stations at Scarborough, Kennedy, Agincourt, Milliken, Unionville, Centennial, Markham, Mount Joy, Stouffville, and Lincolnville.

2021 EPR Addendum

Several new tracks, track upgrades and a new storage yard (to be electrified) have been proposed as part of the NT&F TPAP. Therefore, a review and additional assessment of potential impacts from an electrification perspective is required and is summarized in **Table 2-5** below. The locations of these features, along with previously approved electrification infrastructure, are shown in detail in **Figure 2-5.**

TABLE 2-5: SUMMARY OF STOUFFVILLE CORRIDOR EPR ADDENDUM STUDY AREA AND RESPECTIVE MAP REFERENCES

Electrification Corridor Segment	Proposed New Infrastructure included in New Track and Facilities TPAP/ Study Area Segment	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N) – 2021 EPR Addendum
SV-3	Track Segment ST-1: New track eastside of new island platform from Mile 51.00 to 50.73	Portion of new track / GO Station Platform infrastructure (east side mile 50.95 to ~50.72) fall outside of 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone..	SV-33 to SV-34
	Track Segment ST-1: New Platform at Unionville GO Station	Outside 2017 Electrification TPAP scope. To be addressed in NT&F TPAP.	SV-34
SV-4	Track Segment ST-1 & ST-2: Unionville Storage Yard from Mile 50.61 to 50.31	Portion of new infrastructure (west side mile 50.61 to 50.31) falls outside of 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	SV-34 to SV-36
SV-5/SV-6	Track Segment ST-3 & ST-4: New Platform at Mount Joy GO Station	Outside 2017 Electrification TPAP scope. To be addressed in NT&F TPAP.	SV-48 to SV-49

Electrification Corridor Segment	Proposed New Infrastructure included in New Track and Facilities TPAP/ Study Area Segment	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N) – 2021 EPR Addendum
	New passing track for new side platform from Mile 46.35 to 45.42	Portion of the new track infrastructure (east side ~mile 46.36 to mile 45.41 and west side ~ mile 46.35 to 46.36 and mile 45.42 to 45.41) falls outside of 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	SV-47 to SV-50

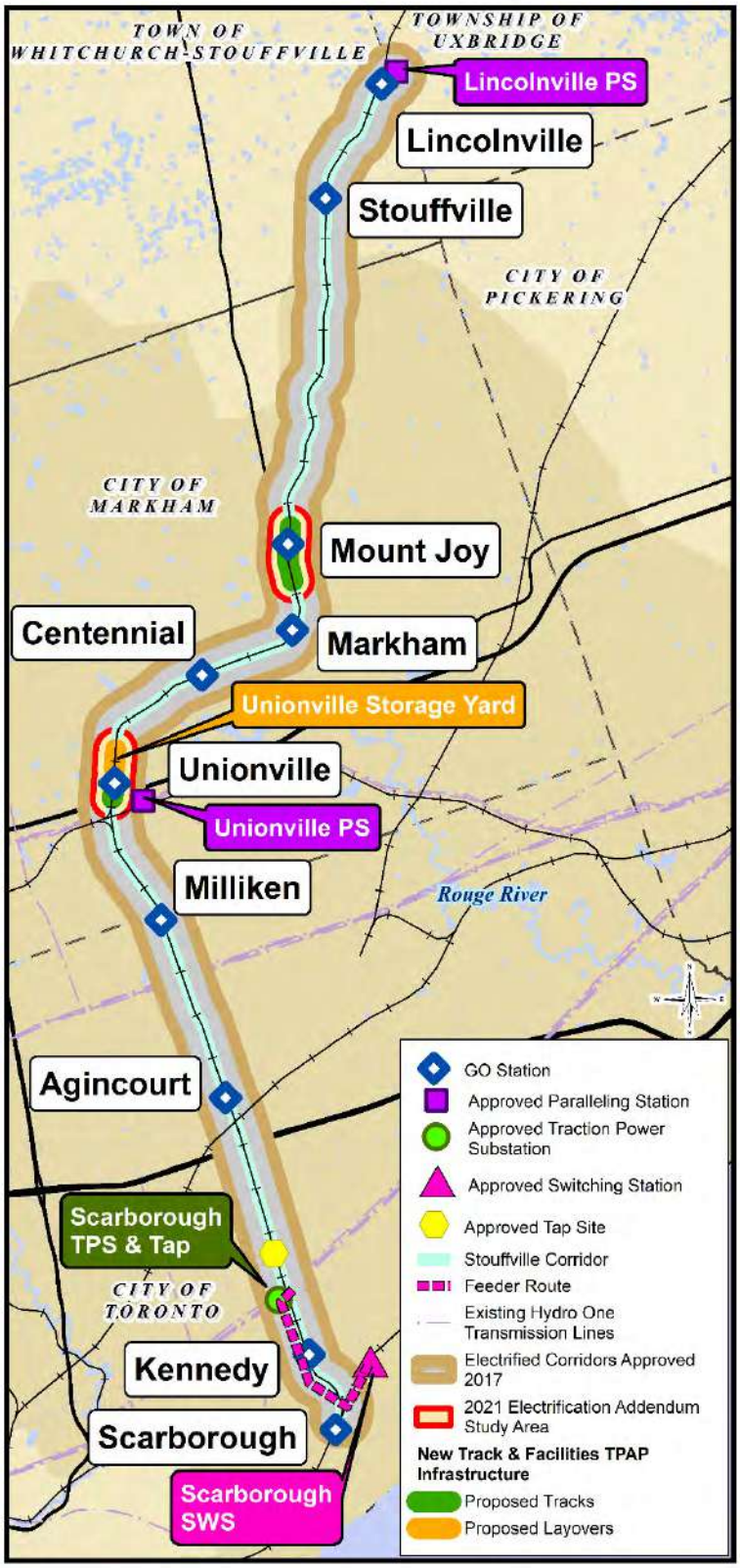

FIGURE 2-5: STOUFFVILLE – EPR ADDENDUM CORRIDOR KEY PLAN

2.2.9 Lakeshore East Rail Corridor

2017 EPR

As part of the GO Rail Network Electrification EPR, the Lakeshore East Corridor electrification limits were defined as: beginning at the limits of the Don Yard Layover located at Mile 332.19 on the Kingston Subdivision and continuing east to Oshawa Station Mile 11.76 on the GO Subdivision. A conceptual design was prepared that consisted of four tracks from sta. 2+700 (Mile 332.2) to 32+100 (Mile 313.9/Mile 0), and three tracks from sta. 32.100 (Mile 313.9/Mile 0) to Oshawa Station, with one passing siding.

2021 EPR Addendum

Several new tracks and track upgrades, as well as new layover/storage yard facilities have been proposed as part of the NT&F TPAP. A new train layover facility (to be electrified) was also proposed as part of the Scarborough Junction Grade Separation TPAP. Therefore, a review and assessment of potential impacts from an electrification perspective is required and is summarized in **Table 2-6** below. The locations of these features, along with previously approved electrification infrastructure, are shown in detail in **Figure 2-6.**

TABLE 2-6: SUMMARY OF LAKESHORE EAST CORRIDOR EPR ADDENDUM STUDY AREA AND RESPECTIVE MAP REFERENCES

Electrification Corridor Segment	Proposed New Infrastructure included in New Track and Facilities TPAP[25]/ Study Area Segment	Proposed New Infrastructure included in Scarborough Junction Grade Separation TPAP	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N)- 2021 EPR Addendum
LSE-3	-	Midland Layover	Portion of the new layover facility falls outside of the 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	LSE-18 to LSE-20
	Track Segment LSE-1: New storage/ reversal pocket track north side of Mile 323.36 to 323.76.	-	Portion of the new track infrastructure (north side ~mile 323.65 to mile 323.71) falls outside 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	LSE-22

[25] [Note to Draft: the infrastructure proposed as part of the New Track and Facilities TPAP will be reviewed and updated for consistency and further refinements to the electrification assessment will be included in the Final EPR Addendum].

Electrification Corridor Segment	Proposed New Infrastructure included in New Track and Facilities TPAP[25]/ Study Area Segment	Proposed New Infrastructure included in Scarborough Junction Grade Separation TPAP	Comparison to 2017 Electrification EPR Scope/Mapping	Updated Conceptual Electrification Corridor Plan Figure Reference (Appendix N)- 2021 EPR Addendum
LSE-8	Track Segment LSE-2: Thickson Road Bridge expansion north side of Mile 10.67	-	Area of disturbance beyond 7m vegetation zone from 2017 Electrification TPAP study area.	LSE-65 to LSE-66
	Track Segment LSE-2 & LSE-3: Retaining Wall at Thickson Road	-	Entirety of new track infrastructure falls outside 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	LSE-65 to LSE-66
	Track Segment LSE-3 & LSE-4: New third track from Mile 10.44 to 11.76	-	Portion of the new track infrastructure (north side ~mile 10.61 to mile 11.76) falls outside 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	LSE-65 to LSE-67
	Track Segment LSE-4: New Platform and Retaining Wall at Oshawa GO Station	-	Outside 2017 Electrification TPAP Scope. To be addressed in NT&F TPAP	LSE-67
	Track Segment LSE-4: New track north side of new island platform from Mile 11.56 to 11.74	-	Entirety of new track infrastructure falls outside 2017 Electrification TPAP study area, and results in a revised 7m OCS Impact/Vegetation Removal Zone.	LSE-66 to LSE-67

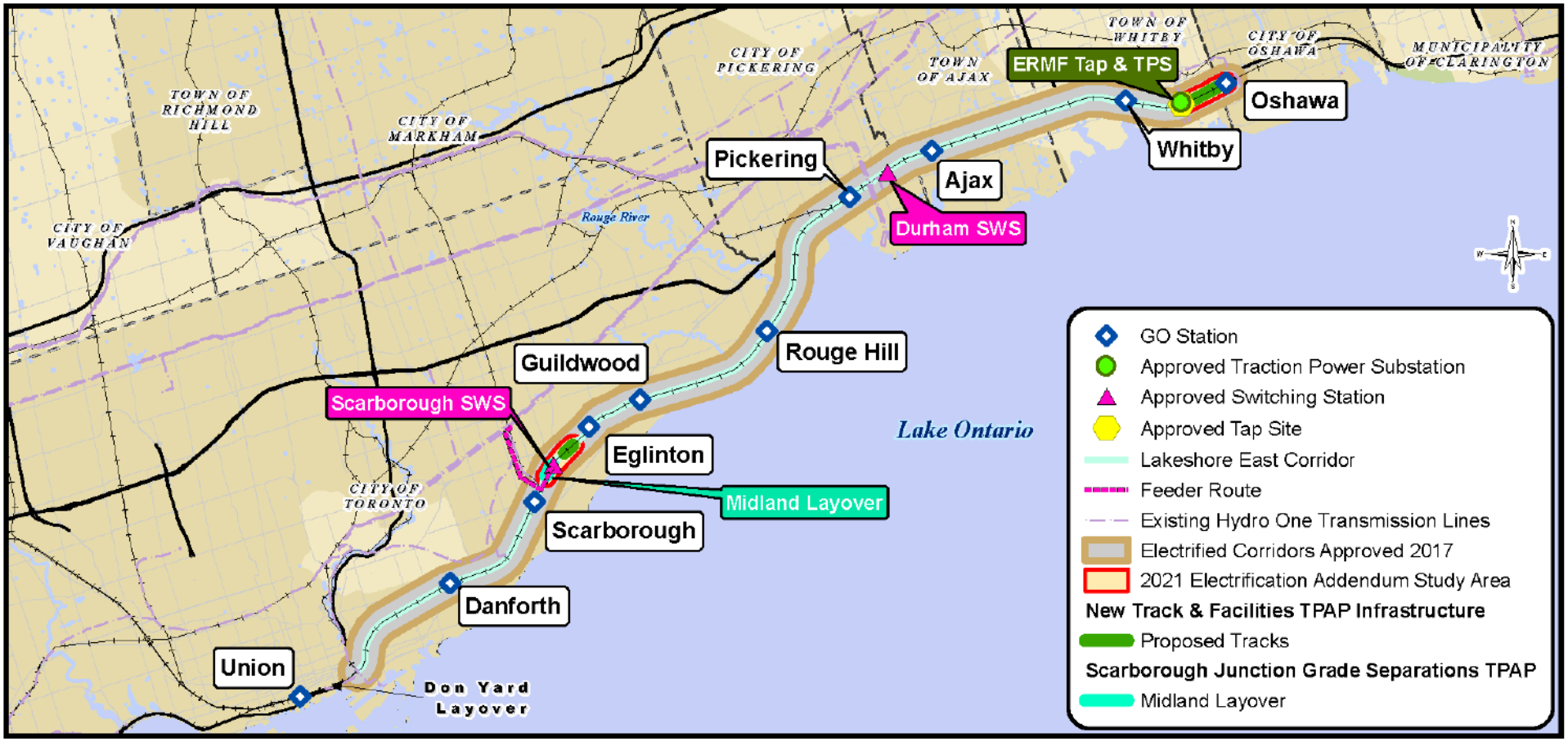

FIGURE 2-6: LAKESHORE EAST – EPR ADDENDUM CORRIDOR PLAN

2.3 Changes to Proposed Infrastructure within Union Station Rail Corridor

Following the 2017 EPR, Metrolinx has undertaken additional review and analysis, in coordination with Hydro One, to confirm locations within and along the USRC where the proposed electrification infrastructure is in conflict with existing overhead Hydro One infrastructure. Therefore, to eliminate these conflicts, additional engineering design has been undertaken to identify solutions for relocating Hydro One transmission infrastructure. In order to ensure that potential environmental impacts of these relocations/solutions are evaluated, these proposed works are being assessed as part of this 2021 EPR Addendum. Specifically, these entail relocating Hydro One transmission infrastructure in the vicinity of the USRC from approximately Mile 0.72E (just east of Henry Lane Terrace) to Mile 1.72E (just west of the Don River Valley), including the following elements:

- Relocating Hydro One transmission infrastructure using utility bridges adjacent to the Lower Sherbourne Street USRC Bridge (Subway)[26], Parliament Street USRC Bridge (Subway) and Cherry Street USRC Bridge (Subway)[27] (see **Figure 2-7**:).
- Relocating two (2) overhead circuits and one (1) underground circuit to a new underground transmission corridor from the Esplanade Transmission Station (TS) to the Don Fleet Junction (JCT).
    - Proposed underground transmission corridor is to accommodate a spare circuit, therefore, the relocated corridor will be designed to contain up to four (4) transmission cables utilizing a combination of surface troughs, cable banks and utility bridges.
- Replacement of three (3) existing potheads, and replacement/extension of existing chain link fence with Durisol© wall to capture existing Hydro One Tower #9 at the existing Don Fleet JCT (located on the east side of the Lower Don Trail) (see **Figure 2-8**:).
- Removal of existing Hydro One Tower #10A, installation of two (2) new BPEX structures[28], overhead connection of two (2) circuits from BPEX structures to existing Hydro One Tower 9, and installation of Durisol© wall at the new Don Fleet JCT (located on the west side of the Lower Don Trail) (see **Figure 2-8**:).

Additionally, Metrolinx and Hydro One have identified the need to locate an additional Hydro One transmission structure (i.e., steel monopole) between the Lower Don Valley River and Corktown Common to accommodate clearance requirements for the USRC Overhead Catenary System (OCS). A future addendum is to be completed to address environmental assessment requirements; at which time the significance of potential impacts will be determined.

[26] Utility bridge at Lower Sherbourne Street will be attached to the future expanded bridge, as approved in 2018 under the USRC East Enhancements Environmental Project Report.
[27] Proposed utility bridges are anticipated to be a truss structure clad in either horizontal or vertical fins, regardless of which treatment options are applied. Metrolinx's preferred utility bridge design is the base case (Option 1) solution, shown in Figure 2-7:.
[28] Each BPEX structure will contain three (3) new potheads.

Figure 2-7: includes the base concept design for the proposed utility bridge adjacent to the Lower Sherbourne Street USRC Bridge, which will host Hydro One transmission infrastructure.

FIGURE 2-7: PRELIMINARY DESIGN RENDERING OF HYDRO ONE UTILITY BRIDGE AT LOWER SHERBOURNE USRC BRIDGE

Figure 2-8: depicts the proposed works at the Don Fleet Junction location.

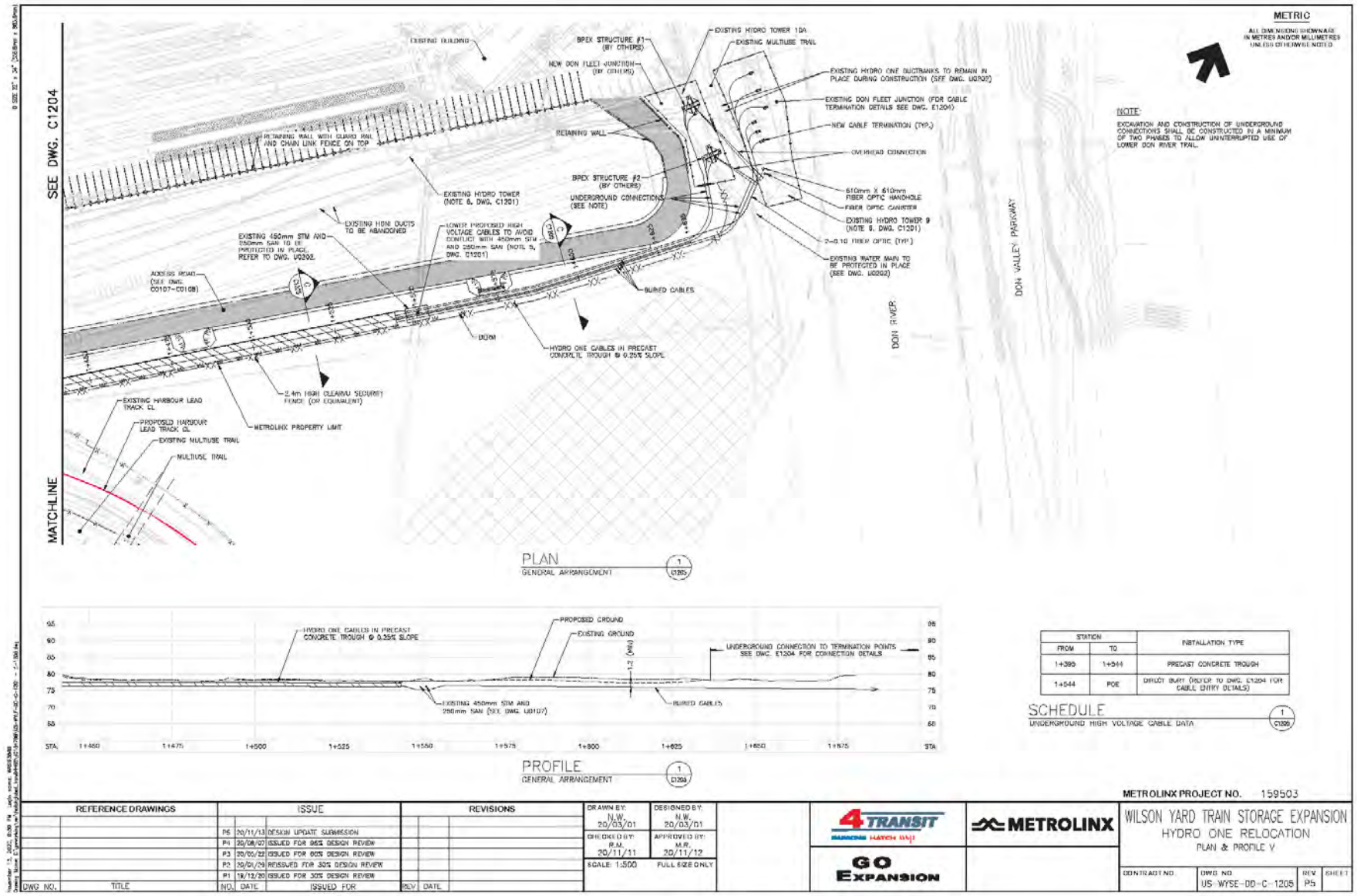

FIGURE 2-8: DON FLEET JUNCTION PLAN & PROFILE DRAWING

2.3.1 Construction Methods – Proposed USRC Infrastructure

The primary construction methods/techniques associated with proposed USRC infrastructure are described as follows:

- Guided boring (trenchless technology);
- Direct burial of cables;
- Duct bank;
- Utility bridges to support cables; and
- Excavation and installation of precast concrete troughs.

It is anticipated that the following typical construction methods will be required to install Hydro One Transmission infrastructure and ancillary components:

- Trenchless and underground excavations;
- Excavation and trenching;
- Installation of precast concrete troughs, direct buried cables, and ducts;
- Installation of precast concrete electrical manholes and grounding;
- Supply and installation of ducts using direction drilling;
- Installation of prefabricated utility bridges (Lower Sherbourne, Parliament, and Cherry Streets);
- Pulling cables;
- Construction of new Don Fleet JCT;
- Construction of 2 new BPEX structures within the new Don Fleet JCT;
- Slacking, removal, and disposal of overhead hydro wires; and
- Dismantling and removal of decommissioned hydro towers (10) to minimum 1m below grade.

Underground Utility Corridor

It is anticipated that the following typical construction methods will be required to relocate two (2) overhead circuits and one (1) underground circuit to a new underground transmission corridor from the Esplanade Transmission Station (TS) to the Don Fleet Junction (JCT):

- Guided boring (trenchless technology);
- Direct burial of cables;
- Duct bank;
- Utility bridges to support cables; and
- Excavation and installation of precast concrete troughs.

Launch and reception shafts are required for the guided boring method. The launch shaft for the Metrolinx track crossing is between the north side of the USRC and the south wall of Esplanade Transmission Station. Gate LE 21 on Lower Sherbourne Street will be used as access for guided boring operations. In addition, surface and in-ground settlement monitoring points will be installed when boring under existing tracks.

Typical cut and cover construction will be used for the installation of precast surface troughs and direct buried cables. Within 3m of existing hydro towers, HONI only permits the use of hydrovac or hand tools for excavation.

Utility Bridges

The relocation of the HONI infrastructure requires the installation of three new steel utility bridges where the proposed cable route crosses Lower Sherbourne, Parliament, and Cherry Streets. There will be structural steel risers installed at both sides of the utility bridges for transitioning HONI cables from below ground to surface and back to ground after crossing the utility bridge. The risers will be attached to a concrete slab founded on micro piles to avoid differential settlements.

These three utility bridges are single span steel truss structures which crossover the existing roadways to the south of the existing railway bridges in this area. This work will need to be coordinated with Metrolinx and the City of Toronto for construction near the tracks and any road closures required. It is anticipated that the following considerations need to be addressed when installing the utility bridges:

- Work blocks will need to be coordinated with Metrolinx if work needs to be completed within proximity to the existing track lines;
- Construction works required in proximity to in-service tracks (e.g., excavation, lifting of bridges, etc.) shall be carried out between trains under the supervision of a railway flagman;
- Roadway traffic interruptions shall be limited as much as reasonably possible; and
- Lane or road closures are anticipated during construction when steel trusses are lifted into place.

In order to install the three new utility bridges some modifications to the existing bridge wingwalls at Parliament Street and Cherry Street are necessary. Modifications to the Lower Sherbourne Street wingwalls will be performed under a separate contract and are not part of this project scope. Modifications to the existing Parliament and Cherry Street wingwalls will require temporary shoring behind the wingwalls to install the concrete extensions, and due to the proximity of the modifications to the existing Metrolinx tracks this temporary shoring will need to be designed as per the Metrolinx General Guidelines for Bridges and Structures to support track loading. For safety reasons, during this construction, one sidewalk at a time may need to be closed to pedestrians to allow workers room to access the front face of the wingwalls.

The new steel utility bridges can be fully constructed as one unit in a lay-down location and once the wingwall modifications are complete the bridges can be installed in their final position using a crane. A full road closure would be required for the duration of lifting to ensure public safety. However, it is expected that these lifts can be carried out overnight to minimize traffic disruption. Following the installation of the spans, work can be done on the approaches installing risers for the cable transitions, and soil grading, before final installation of the HONI cabling within the steel truss.

The design and construction of the utility bridges will be coordinated with the USRC East bridge extensions work (i.e., Jarvis Street and Lower Sherbourne Street).

Construction and laydown areas will be confirmed during design validation and it is expected that all laydown/staging will be completed within Metrolinx property.

2.4 Revised GO Expansion Service Level Plan

Changes to the anticipated GO Expansion service levels (compared to those previously assessed in 2017) that constitute revised noise, vibration and air quality impact assessment studies. The revised service levels and operating scenario are generally described as follows (refer to Section 2 for further detail).

The new GO Expansion Service Plan[29] (also referred to as the *Ultimate Capacity Train Service*) anticipates the following ultimate weekday train trips per day:

- Union Station Rail Corridor – 703
- Lakeshore West Rail Corridor- 267

[29] The service plan is based on current forecasts of future demand for express rail service and is subject to revision.

- Kitchener Rail Corridor - 164
- Barrie Rail Corridor – 245
- Stouffville Rail Corridor - 351
- Lakeshore East Rail Corridor - 251

Future demand will be met with new electric rolling stock and existing diesel trains in the following configurations:

- Electric locomotive powered 12- car (peak period) and 6-car (off-peak period) trains;
- Diesel locomotive powered 12-car (peak period) and 6-car (off-peak period) trains; and,
- Electric Multiple Units (EMU) with 1 to 4 units. EMUs are self-powered electric cars, they aren't pulled or pushed by locomotives.

According to the service plan, some locations will be served by electric trains (Metrolinx-owned rail lines), some by a mix of electric and diesel trains (rail corridors with joint ownership), and others by only diesel trains (rail lines not owned by Metrolinx). Refer to **Figure 1-3** for a reference map.

2.4.1 Union Station Rail Corridor

Existing daily service levels based on maximum service levels in 2015, as previously assessed in the 2017 EPR consisted of:

- 154 revenue and non-revenue diesel trains

In the Ultimate Capacity scenario for Year 2037, the train fleet travelling on the GO Rail Network servicing Union Station will be a combination of electric and diesel. Travelling the USRC on a daily basis will be:

- 200 revenue and non-revenue diesel trains;
- 503 revenue and non-revenue electric trains;

Current and future revenue trains on the USRC provide both regular and express services. Current and future non-revenue trains on the USRC Corridor typically travel between stations and layovers and therefore do not travel along the entirety of the Corridor. In addition to the GO Transit trains, VIA trains and CN freight switcher trains are also in operation along the USRC and were included in the modeling.

One major infrastructure addition was incorporated in the assessment:

- The new Wilson Yard Layover, adjacent and south of the Don Yard Layover.

As part of the electrification of the GO Rail Network, an electric traction power facility (TPF) was evaluated within the USRC:

- Don Yard Paralleling Station (PS).

The location of the Don Yard PS in the 2017 EPR was in the Lakeshore East Corridor, on the north side of the tracks, just east of the Don River. The TPF is now located in the USRC, on the south side of the tracks, just west of the Don River.

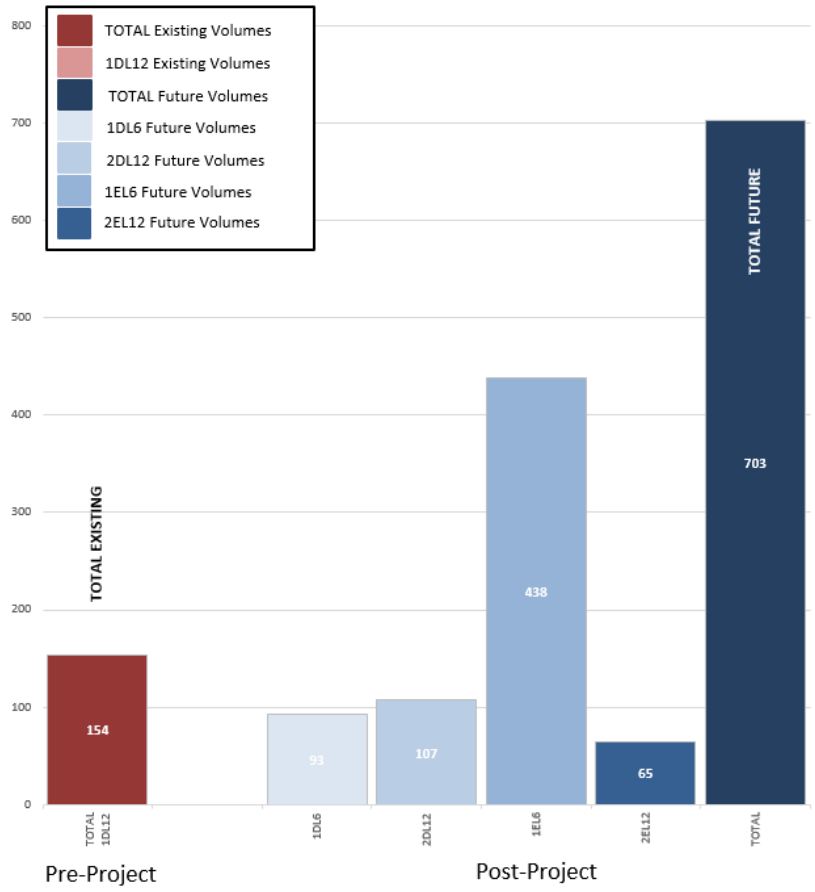

FIGURE 2-9: SUMMARY OF EXISTING (2015) AND FUTURE RAIL VOLUMES FOR USRC

Note: 1DL6 = 1 Diesel Locomotive + 6 Cars
1DL12 = 1 Diesel Locomotive + 12 Cars
2DL12 – 2 Diesel Locomotives + 12 Cars
1EL6 – 1 Electric Locomotive + 6 Cars
2EL12 – 2 Electric Locomotives + 12 Cars
2EL12 – 2 Electric Locomotives + 12 Cars

2.4.2 Lakeshore West Rail Corridor

Existing daily service levels based on maximum service levels in 2015, as previously assessed in the 2017 EPR consisted of:

- 92 revenue trains; and
- 66 non-revenue trains.

There were no trains operating on the Canpa subdivision in 2015.

In the Ultimate Capacity scenario for Year 2037, the train fleet travelling on the Lakeshore West (LSW) Corridor between Union Station and Burlington GO Station will be a combination of electric and diesel powered locomotives. The train fleet travelling from Union Station to beyond Burlington GO Station onwards to Aldershot GO, Confederation GO, Lewis Road GO, Hamilton GO, and West Harbour GO will be powered exclusively by diesel locomotives. Travelling the LSW Corridor on a daily basis will be:

- 99 revenue diesel trains;
- 24 non-revenue diesel trains;
- 168 revenue electric trains; and
- 54 non-revenue electric trains.

The future train fleet travelling on the Canpa subdivision will be all diesel. Travelling on the Canpa subdivision on a daily basis will be:

- 10 non-revenue diesel trains (consisting of 2 locomotives and 12 cars).

Current and future revenue trains on the LSW Corridor provide both regular and express services. Current and future non-revenue trains on the LSW Corridor typically travel between stations and layovers and therefore do not travel along the entirety of the Corridor. In addition to the GO Transit trains, VIA trains and CN freight switcher trains are also in operation along the LSW Rail Corridor and were included in the modeling.

Three major infrastructure additions were incorporated in the assessment:

- Park Lawn GO Station in Toronto, between Exhibition GO and Mimico GO Stations;
- The Mimico South Layover, located just south of the Willowbrook Rail Maintenance Facility;
- One new Layover Facility west of Appleby GO Station:
    - The Walkers Line Layover Facility located between the Appleby GO and Burlington GO Stations.

As part of the electrification of the GO Rail Network, four electric traction power facilities (TPFs) are required on the LSW Corridor:

- Mimico Tap/Traction Power Substation (TPS);
- Mimico Switching Station (SWS);
- Oakville Switching Station (SWS); and
- Burlington Tap/TPS.

The location of the Mimico Tap/TPS has been shifted slightly within the same property parcel. All other TPFs are unchanged from the 2017 EPR.

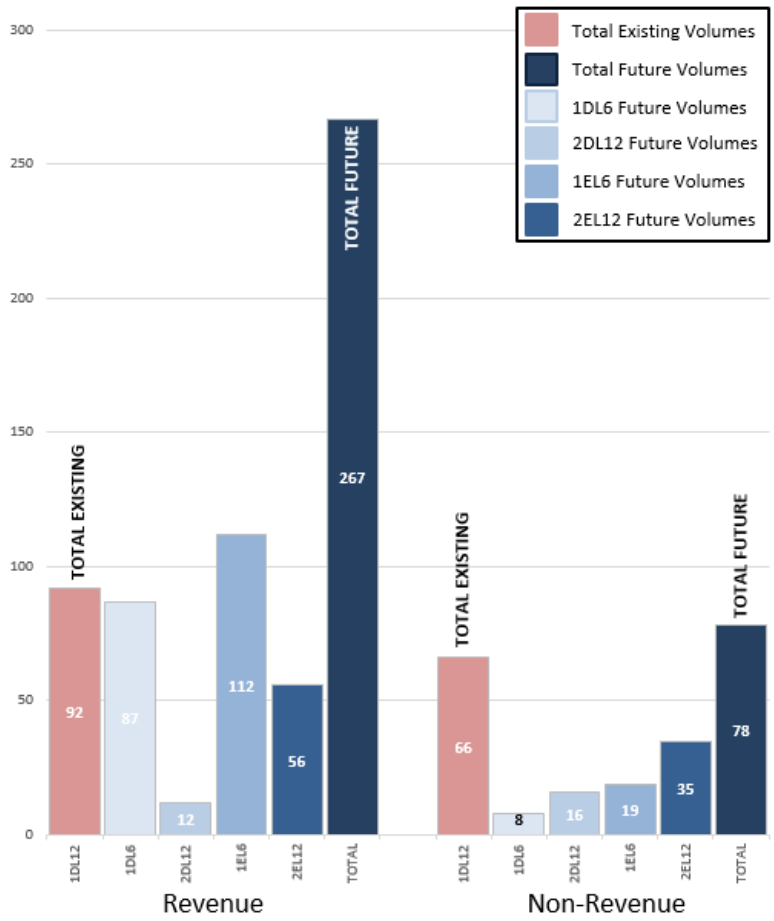

FIGURE 2-10: SUMMARY OF EXISTING (2015) AND FUTURE RAIL VOLUMES FOR LAKESHORE WEST CORRIDOR

Note: 1DL6 = 1 Diesel Locomotive + 6 cars
1EL6 = 1 Electric Locomotive + 6 Cars
2DL12 = 2 Diesel Locomotives + 12 Cars
2EL12 = 2 Electric Locomotives + 12 Cars

2.4.3 Kitchener Rail Corridor

Existing daily service levels based on maximum service levels in 2015, as previously assessed in the 2017 EPR consisted of:

- 30 revenue diesel trains; and
- 4 non-revenue diesel trains.

In the Ultimate Capacity scenario for Year 2037, the GO train fleet will be diesel. Travelling on the Kitchener Corridor on a daily basis will be:

- 164 revenue diesel trains.

There are no non-revenue diesel trains in the study area in the Ultimate Capacity scenario. Future electrification of Metrolinx-owned segments of the corridor are being assessed under separate environmental assessment approvals.

Current revenue trains on the Kitchener Corridor provide both regular and express services. Current non-revenue trains on the corridor typically travel between stations and layovers and therefore do not travel along the entirety of the corridor. In the future, Kitchener GO Transit operations will provide local service only with diesel trains servicing Malton GO Station and Bramalea GO Station. In addition to the GO Transit

trains, CN freight switcher trains are also in operation along the Kitchener Rail Corridor and were included in the assessment.

As part of the electrification of the GO Rail Network, one paralleling station (PS) will be constructed in the vicinity of the Bramalea GO Station (Bramalea PS). The location of the Bramalea PS is unchanged from the 2017 EPR.

There are no major infrastructure changes were included in the assessment.

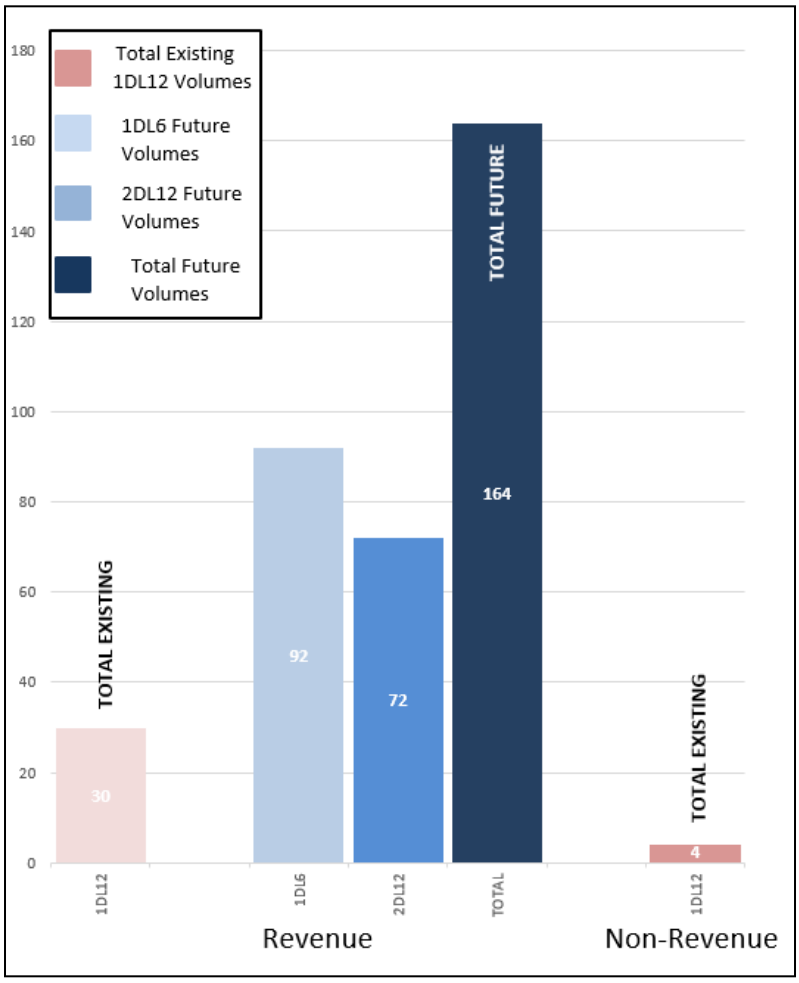

FIGURE 2-11: SUMMARY OF EXISTING (2015) AND FUTURE RAIL VOLUMES FOR KITCHENER CORRIDOR[30]

Note: 1DL12 = 1 Diesel Locomotive + 12 cars
1DL6 = 1 Diesel Locomotive + 6 cars
2DL12 = 2 Diesel Locomotives + 12 Cars

2.4.4 Barrie Rail Corridor

Existing daily service levels based on maximum service levels in 2015, as previously assessed in the 2017 EPR consisted of:

- 14 revenue diesel trains; and

[30] The future scenario used for modelling is a 'worst-case' service concept only developed for this project, which assumes full diesel service (despite the intention to implement electric train service on this corridor). The Project consortium will be responsible for developing the service concept to meet contractual service level requirements.

- 13 non-revenue diesel trains.

In the Ultimate Capacity scenario for Year 2037, the train fleet travelling on the Barrie Corridor will be both electric and diesel. Trains travelling the Barrie Corridor daily will be:

- 13 revenue diesel trains;
- 232 revenue electric trains; and
- 130 non-revenue electric trains.

There are no non-revenue diesel trains in the Ultimate Capacity scenario.

Current revenue trains on the Barrie Rail Corridor provide local service only, there is currently no express service. Current and future non-revenue trains on the corridor typically travel between stations and layovers and therefore do not travel along the entirety of the corridor. In the future, both local and express service will be provided. In addition to the GO Transit trains, CN freight switcher trains are also in operation along the corridor and were included in the modeling.

Six major infrastructure changes were incorporated in the assessment:

- Addition of Bloor-Lansdowne GO Station in Toronto, between Union Station and York University GO Stations;
- Addition of Caledonia GO Station in Toronto, between future Bloor-Lansdowne GO and York University GO Stations;
- Addition of Kirby GO Station in Vaughan, between Maple GO and King City GO Stations;
- Addition of Innisfil GO Station in Innisfil, between Bradford GO and Barrie South GO Stations;
- Removal of York University GO Station; and
- Addition of Bradford Layover Facility located in Bradford, north of the Bradford GO Station.

The Bradford Passing Loop was incorporated into the future operational changes; however, this is not considered a major infrastructure project.

As part of the electrification of the GO Rail Network, four TPFs are required;

- Maple PS;
- Newmarket SWS;
- Gilford PS; and
- Allandale Tap/TPS.

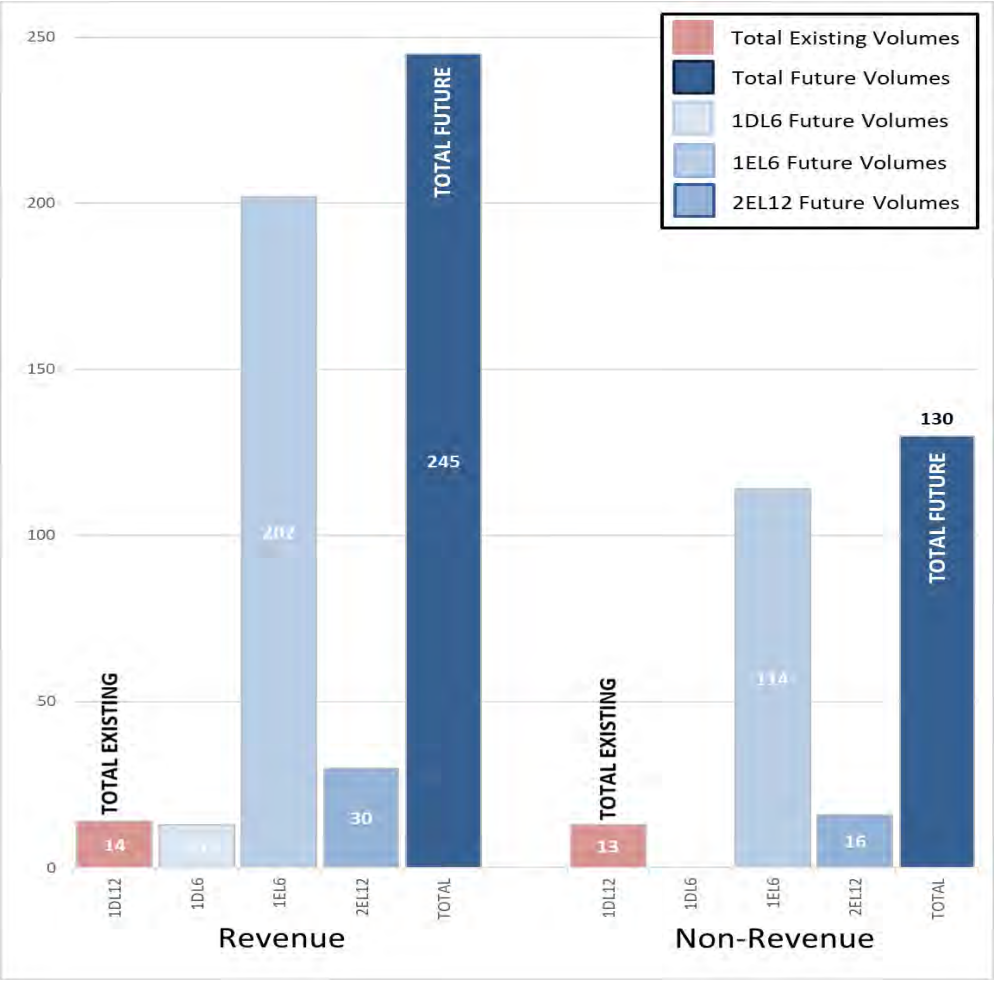

FIGURE 2-12: SUMMARY OF EXISTING (2015) AND FUTURE RAIL VOLUMES FOR BARRIE CORRIDOR

Note: 1DL12 = 1 Diesel Locomotive + 12 Cars 1DL6 = 1 Diesel Locomotive + 6 Cars
1EL6 = 1 Electric Locomotive + 6 Cars 2EL12 = 2 Electric Locomotives + 12 Cars

2.4.5 Stouffville Rail Corridor

Existing daily service levels based on maximum service levels in 2015, as previously assessed in the 2017 EPR consisted of:

- 15 revenue diesel trains; and
- 3 non-revenue diesel trains.

In the Ultimate Capacity scenario for Year 2037, the train fleet travelling on the Stouffville Corridor between Union Station and Lincolnville GO Station will be a combination of electric and diesel locomotives. Travelling the Stouffville Corridor on a daily basis will be:

- 14 revenue diesel trains;
- 337 revenue electric trains; and
- 37 non-revenue electric trains.

Current and future revenue trains on the corridor provide both local and express services. Current and future non-revenue trains on the corridor typically travel between stations and layovers and therefore, do not travel along the entirety of the corridor. In addition to the GO Transit trains, and CN freight switcher trains are also in operation along the corridor.

Five major infrastructure changes were incorporated in the assessment:

- Relocation of existing Lincolnville Station and Layover approximately 800 m to the south;
- Construction of the Unionville Storage Yard Facility located between Unionville GO and Centennial GO;
- Addition of Lawrence East GO station; and
- Addition of Finch Ave GO station.

The Noise & Vibration impacts due to changes in rail operations as a result of the Scarborough Junction Grade Separation Project are considered in the updated assessment. As part of the electrification of the GO Rail Network, three TPF locations were assessed:

- Lincolnville PS;
- Unionville PS; and
- Scarborough TPS.

The Lincolnville Paralleling Station was shifted slightly to the south to accommodate the Lincolnville Layover expansion. All other TPFs are unchanged from the 2017 EPR.

Current layover sites include the Lincolnville Layover. The Lincolnville Layover site will be moved to the south approximately 800 m. The Unionville Storage Yard Facility will be built approximately 500 m north of the Unionville GO station to support the increase in rail traffic volumes.

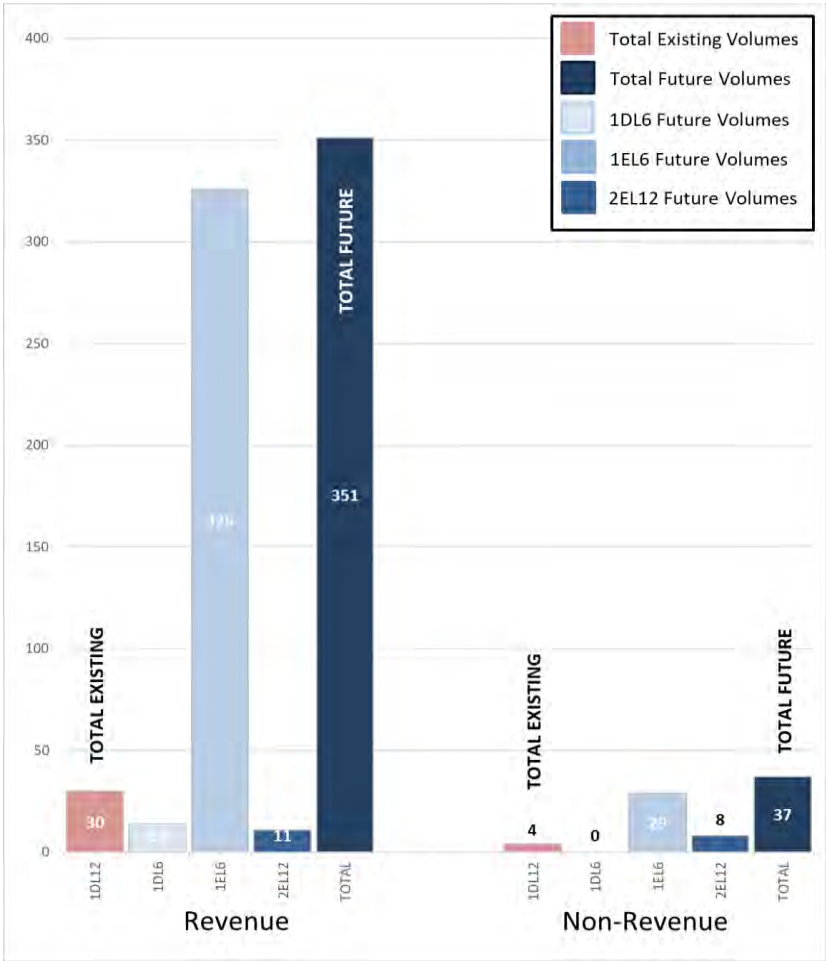

FIGURE 2-13: SUMMARY OF EXISTING (2015) AND FUTURE RAIL VOLUMES FOR STOUFFVILLE CORRIDOR

Note: 1DL12 – 1 Diesel Locomotive + 12 Cars 1DL6 – 1 Diesel Locomotive + 6 Cars
1EL6 – 1 Electric Locomotive + 6 Cars 2EL12 – 2 Electric Locomotives + 12 Cars

2.4.6 Lakeshore East Rail Corridor

Existing daily service levels based on maximum service levels in 2015, as previously assessed in the 2017 EPR consisted of:

- 89 revenue diesel trains; and
- 10 non-revenue diesel trains.

In the Ultimate Capacity scenario for Year 2037, the train fleet travelling on the Lakeshore East Corridor between Union Station and Oshawa GO Station will be both electric and diesel. Travelling the corridor on a daily basis will be:

- 95 revenue diesel trains;
- 156 revenue electric trains;
- 70 non-revenue diesel trains; and
- 38 non-revenue electric trains.

Current and future revenue trains on the corridor provide both local and express services. Current and future non-revenue trains on the corridor typically travel between stations and layovers and therefore do not travel along the entirety of the corridor. In addition to the GO Transit trains, VIA trains and CN freight switcher trains are also in operation along the corridor. CN freight traffic was not included in the assessment where it operates on a parallel set of tracks from Durham Junction east to Oshawa GO Station.

Three major infrastructure additions were incorporated in the assessment:

- East Harbour GO Station in Toronto, between Union Station and Danforth GO Station;
- The Whitby Rail Maintenance Facility (WRMF[31]) located between the Whitby and Oshawa GO Stations; and
- Midland Layover located between Scarborough and Eglinton GO Station

The Noise & Vibration impacts due changes in rail operations as a result of the Scarborough Junction Grade Separation Project are considered in the assessment.

Modelling also included an assessment of the existing layovers located on the corridor (Henry Street Layover and Oshawa Layover) along with the following proposed TPFs (assessed as part of the 2017 GO Rail Network Electrification TPAP):

- WRMF Traction Power Substation (TPS) and tap;
- Durham Switching Station (SWS); and
- Scarborough SWS.

[31] Referred to as East Rail Maintenance Facility (ERMF) within 2017 GO Rail Network Electrification EPR.

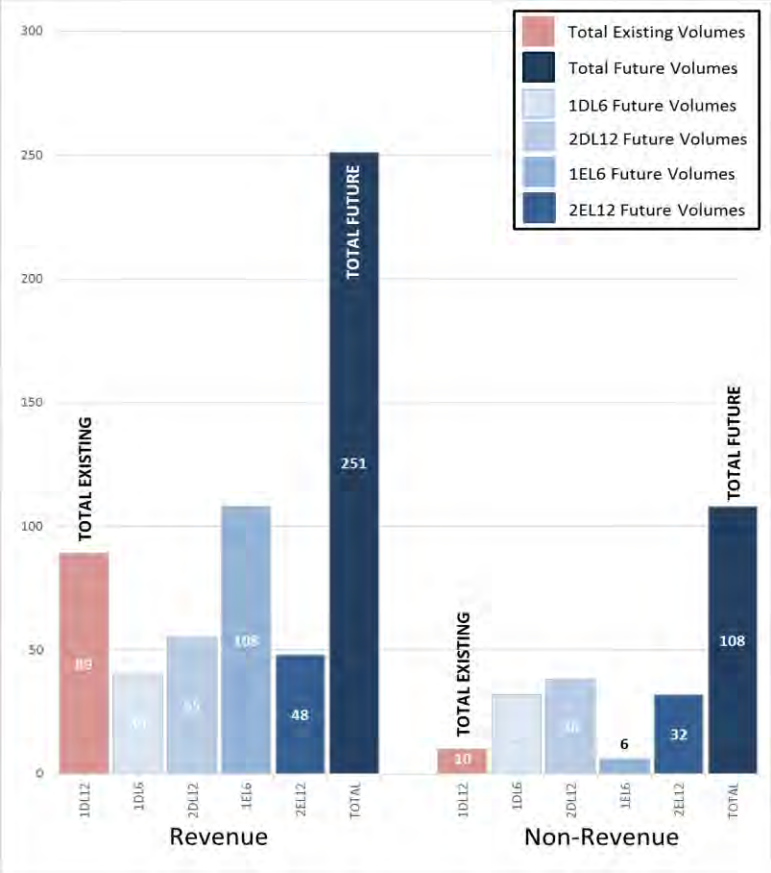

FIGURE 2-14: SUMMARY OF EXISTING (2015) AND FUTURE RAIL VOLUMES FOR LAKESHORE EAST CORRIDOR

Note: 1DL12 – 1 Diesel Locomotive + 12 Cars
1DL6 – 1 Diesel Locomotive + 6 Cars
2DL12 – 2 Diesel Locomotives + 12 Cars
1EL6 – 1 Electric Locomotive + 6 Cars
2EL12 – 2 Electric Locomotives + 12 Cars

3 Baseline Conditions

3.1 Approach, Methodology and Organization

In accordance with the Transit Projects and Metrolinx Undertakings (Transit Projects Regulation) O.Reg. 231/08, an assessment of baseline conditions within the study area was conducted for the 2017 GO Rail Network Electrification TPAP. Due to the changes to the study areas (and areas of impact) associated with the Significant Addendum to the GO Rail Network Electrification TPAP, assessments of baseline conditions were reviewed and undertaken where required, for the new areas of impact. Accordingly, this section provides a summary of the baseline environmental conditions for the new areas of impact utilizing information from the 2017 GO Rail Network Electrification TPAP, as well as baseline conditions reporting prepared as part of the NT&F TPAP, SJGS TPAP, and the USRC East Enhancements TPAP. For information on project design and technical components refer to Section 2. The revised limits of the OCS Impact/Vegetation Clearance Zone and changes to the proposed infrastructure within the USRC assessed as part of this EPR Addendum and associated study area have been identified in Updated Conceptual Electrification Corridor Plans presented in EPR Addendum **Appendix N**. Study areas associated with updated noise, vibration, and air quality studies are outlined in Section 1.4.5.3 and Section 1.4.5.4 respectively, and details on assessment methodologies for these disciplines are outlined in Section 4.1.1 to Section 4.1.3.

The purpose of preparing a baseline summary is to establish a snapshot of the conditions of the study area during a specific period of time, depending on the scope of the study. The baseline conditions form the basis from which the impact assessment is carried out, as described in Section 4.

Generally, baseline conditions data was collected through a review of background information/reports, and field investigations (as required), and was summarized in order to characterize the existing conditions within the study area. Specific methodologies used to collect data for each discipline are briefly summarized in Section 3.1.2 and described in full in the respective supporting reports (see **Appendix P** for a full list of reports referenced, including full titles).

Baseline Conditions Reports referenced from the 2017 GO Rail Network Electrification EPR include:

- Air Quality;
- Archaeology;
- Preliminary Environmental Site Assessment;
- Cultural Heritage;
- Electromagnetic Interference/Electromagnetic Fields;
- Land Use and Socio-Economic;
- Natural Environment;
- Noise & Vibration;
- Utilities; and
- Visual.

Baseline Conditions Report referenced from the NT&F EPR include:

- Archaeology;
- Cultural Heritage;
- Land Use and Socio-Economic;
- Natural Environment;
- Visual; and
- Hydrogeology.

Combined Baseline Conditions and Impact Assessment Reporting also reviewed and referenced from the NT&F EPR include:

- Electromagnetic Interference/Electromagnetic Fields;
- Traffic;
- Utilities; and
- Preliminary Stormwater Management.

Combined Baseline Conditions and Impact Assessment Reporting also reviewed and referenced from the SJGS EPR include:

- Archaeology;
- Natural Environment;
- Cultural Heritage; and
- Land Use and Socio-Economic.

Combined Baseline Conditions and Impact Assessment Reporting also reviewed and referenced from the USRC East Enhancements EPR include:

- Archaeology; and
- Natural Environment.

3.1.1 Baseline Data Collection Analysis

Sections 2.1 to 2.3 of this EPR Addendum describe the study area and Project components that provided the scope for the description of baseline conditions. A conservative 30 metre buffer area was established around these elements of the study area at the baseline conditions phase to allow for comprehensive baseline data collection.

Baseline data collection for each discipline generally involved a combination of desktop review (a review of relevant background reports and discussions with government agencies and other stakeholders) and field investigations as required. While Sections 3.2 to 3.7 of this EPR Addendum describe the findings for each discipline, a more detailed description of the approach and methodologies followed to document baseline conditions is contained in the **2017 GO Rail Network Electrification EPR** as well as the **2021 NT&F EPR, 2020 SJGS EPR**, and the **2018 USRC East Enhancements EPR** where applicable and as referenced**.**

3.1.2 Baseline Data Organization

Sections 3.2 – 3.7 of this report provide a summary of the baseline conditions present at the Project components. These sections have been organized to describe the baseline conditions at each rail corridor. The sections document the baseline conditions according to natural, social, and cultural environmental factors in the following order:

- **Natural Environment Factor:**
  - Terrestrial Features (i.e., vegetation, wildlife/wildlife habitat, etc.)
  - Aquatic Features (i.e., surface water, fish/fish habitat)
  - Hydrological Features (i.e. groundwater and wells)
  - Preliminary Environmental Site Assessment
- **Cultural Environment Factor:**
  - Built Heritage Resources and Cultural Heritage Landscapes
  - Archaeological Resources
- **Social Environment Factor (including Built Environment):**
  - Land Use/Social-Economic Features
  - Property
  - Air Quality
  - Noise
  - Vibration
  - Visual
  - Utilities
  - Stormwater Management
- **Other**
  - Electromagnetic Fields
  - Electromagnetic Interference

3.2 Union Station Rail Corridor

A description of the baseline conditions related to Air Quality and Noise and Vibration operations is discussed below.

3.2.1 Air Quality

Since 2017, Metrolinx has made significant changes to the planned rail infrastructure and train service for the GO Expansion Program, of which Electrification forms a part. The potential air quality impacts of trains and associated equipment and infrastructure have been assessed at both the regional scale, and locally in those segments of the corridors which are expected to experience an increase in diesel (i.e. non-electrified) powered equipment activity relative to the 2015 (pre-project or baseline) levels and which have sensitive receptors exposed to the rail corridor. While diesel service levels will remain the same or decrease (with electric train service taking up the planned increased service levels), there will be an increase in the number of diesel locomotives operating on some corridors. This is due to the need to power diesel trains with two locomotives rather than one during peak periods.

The air quality baseline conditions within the additional study area for this discipline are detailed in **Appendix F2**.

The Study Area begins at Union Station and ends at Cherry Street, approximately 1.7 km in length. The study area extended to 300 m around the rail line, and to 500 m around fixed infrastructure, including stations and layovers. The USRC study area is shown in **Figure 3-1**.

The study area includes the existing Union Station. In addition to GO Stations, there is an existing layover – the Don Yard layover – included in the USRC study area. In the future, an additional layover, the Wilson Yard layover, will be located to the south of the Don Yard Layover.

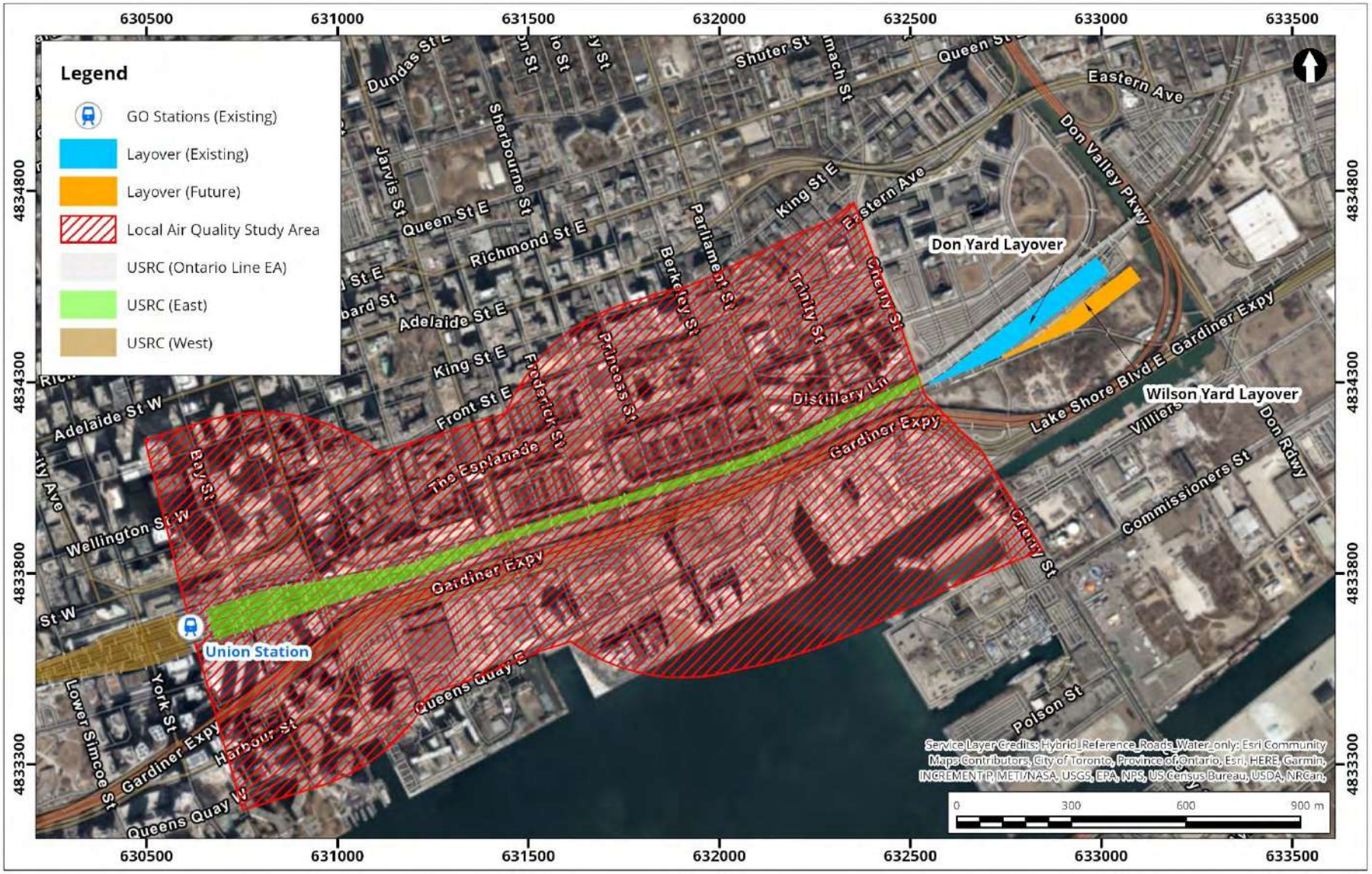

FIGURE 3-1: USRC AIR QUALITY STUDY AREA[32]

[32] USRC West area is not captioned within the scope of this EPR Addendum, and will be assessed as part of a separate Metrolinx undertaking.

Baseline service levels are based on the maximum levels in 2015. Service levels within the USRC study area are as follows:

- 269 GO Transit diesel revenue trains per day (1 locomotive per train);
- 121 GO Transit diesel non-revenue trains per day (1 locomotive per train);
- 79 VIA Rail trains per day; and
- 8 CN Freight trains per day.

For the future scenario, the future rail schedule service levels account for operational and safety considerations and regulations that limit the service levels achievable with a given infrastructure design. Current rail regulations are principally governed by Transport Canada and the US Federal Rail Administration. Rail policy has also been developed by the American Railway Engineering and Maintenance of Way Association (AREMA) and the American Public Transportation Association (APTA). Metrolinx, Canadian National (CN) and Canadian Pacific (CP) Railway have also established additional operational policies, standards, and rules to ensure safe and reliable service.

Collectively, these regulations and policies dictate how railways are designed, operated and maintained. To expand rail service, the regulations and policies have to be considered. If the existing infrastructure does not allow expanded service, then new infrastructure must be considered. Service goals represent long term planning upon which infrastructure plans are developed.

In the future scenario, the train fleet travelling on the USRC will be both electric and diesel. The future service levels of diesel trains travelling on the USRC are as follows:

- 192 GO Transit revenue trains with 2 diesel locomotives;
- 279 GO Transit revenue trains with 1 diesel locomotive;
- 50 GO Transit non-revenue trains with 2 diesel locomotives;
- 26 GO Transit non-revenue trains with 1 diesel locomotive
- 79 diesel revenue VIA diesel trains per day; and
- 16 CN Freight diesel trains per day.

Note that the future rail schedule includes a 10% mark-up of actual projected diesel service levels, to help ensure that the air quality assessment is conservative.

Table 3-1 and **Table 3-2** present background concentrations for all contaminants and relevant averaging times. The 90th percentile 24-hour concentrations for NO_2 and $PM_{2.5}$ were determined using data from the Toronto Downtown monitoring station for the years 2013 to 2017.

TABLE 3-1: SUMMARY OF BACKGROUND CONCENTRATION LEVELS IN STUDY AREA

Contaminant	Averaging Time	Background concentrations (µg/m³)
CO	1 hour	219
	8 hours [2]	1189
NO_2	Annual	28
$PM_{2.5}$	Annual	8.0
PM_{10} [1]	24 hours	26
Benzene	24 hours	0.80
	Annual	0.52
Benzo(a)pyrene	24 hours	9.5E-05

	Annual	5.5E-05
1,3-Butadiene	24 hours	0.07
	Annual	0.04
Formaldehyde	24 hours	3.5
Acetaldehyde	24 hours	1.7
Acrolein	1 hour [3]	0.12
	24 hours	0.07

[1] Ambient Background Level estimated from $PM_{2.5}$ levels using published emission factors (Lall et al., 2004)
[2] 90th percentile 8-hour ambient CO data was not available; the maximum 8-hour concentration from NAPS Station 60430 –Toronto West and NAPS Station 60440 - Toronto North was used
[3] 1-hr average ambient acrolein data was not available; the maximum 24-hr concentration from NAPS Station 62601- Experimental Farm, Simcoe, ON was used.

TABLE 3-2: 90TH PERCENTILE BACKGROUND NO_2 AND $PM_{2.5}$ CONCENTRATIONS BY HOUR OF DAY

Hour of Day	NO_2 (ppb)	$PM_{2.5}$ (µg/m^3)
1	26	16
2	26	16
3	26	16
4	26	16
5	26	16
6	27	17
7	30	16
8	32	16
9	31	16
10	27	16
11	23	16
12	20	16
13	19	15
14	18	14
15	18	14
16	18	14
17	19	14
18	20	15
19	21	15
20	23	15
21	24	16
22	25	15
23	26	15
24	26	15

A comparison of background concentrations to the applicable AAQC's and CAAQS shows that the background concentrations generally meet the air quality objects, with the exception of benzo(a)pyrene and annual average benzene concentrations. This situation with the latter two air contaminants is not unique to the study area, but is widespread across Southern Ontario.

3.2.2 Noise and Vibration

The noise and vibration baseline conditions within the additional study area for this discipline are detailed in **Appendix G1**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.1.

The USRC East Study Area encompasses the area from Union Station to the Don River. However, the results of the noise modelling for rail operations are not presented in this report for the eastern section of the corridor from Cherry Street to Don River. The reason is that future noise impacts for this section of the Corridor will include those from Metrolinx operations as well as from operations of the Ontario Line subway, which will run above ground through this section. The combined noise impacts from Metrolinx and Ontario Line operations, and associated noise mitigation recommendations, will be addressed in a separate report as part of the Ontario Line EA process. The Study Area, indicating the area of Ontario Line operations in grey, is shown in **Figure 3-2**.

The same is not true for vibration, since impacts from Metrolinx GO operations are separate from those from the Ontario Line, that is, vibration from rail movements on separate tracks are not cumulative. As well, any vibration mitigation for Metrolinx GO operations would address new Metrolinx trackwork, while any impacts from the Ontario Line would be addressed on those separate tracks. The current report therefore addresses vibration impacts from Metrolinx GO operations, and associated mitigation, for new trackwork throughout the entire USRC. Trains with arrivals and departures at Union Station from the east and passing through the USRC to GO Rail network stations beyond the Study Area have been included in the Study Area.

Receptors for this assessment include the following sensitive land uses:

- Residences;
- Hotels, motels and campgrounds;
- Schools, universities, libraries and daycare centres;
- Hospitals and clinics, nursing / retirement homes;
- Churches and places of worship;
- Planned residential developments with approved building permits from the Municipality; and
- Vacant lots that are currently zoned for residential use.

Noise receptors within the Study Area are mainly apartment-style buildings or high-rise condominium residences located adjacent to the USRC. Several semi-detached dwellings were also identified within the study area. In general, areas of receptors were identified using publicly available address point databases or through visual identification using publicly available satellite aerial images.

In the 2017 EPR, vacant lots were only assessed for residential developments with approved building permits. In this addendum, all vacant lots that are zoned for residential use (with or without building permits) were included in the assessment. All vacant residential lots within the Study Area were considered.

Representative noise receptors were chosen to simplify the presentation of results for a much larger number of receptors assessed. The representative noise receptors are summarized in **Table 3-3**. Complete mapping of noise receptors is included in **Appendix G.**

For the assessment of vibration, the proximity of all noise receptors within the USRC to changes in track alignment or special trackwork was assessed. The following areas were identified as areas of investigation for operational vibration:

- Approximately 1.6 km of trackwork east of Union Station; and
- 17 new switches along the Corridor.

Receptors for vibration include the same sensitive land uses as described in the noise assessment. However, future development locations that did not have approval for residential uses were not included since they would need to be designed to achieve appropriate vibration levels with the future rail infrastructure in place. The point of evaluation is defined as 5 to 10 m from the building foundation in a direction parallel to the tracks.

FIGURE 3-2: USRC NOISE & VIBRATION STUDY AREA[33]

[33] USRC West area is not captioned within the scope of this EPR Addendum, and will be assessed as part of a separate Metrolinx undertaking.

TABLE 3-3: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS

Track Section	Receptor ID[1]	Figure[34]	Description	Receptor Distance from Nearest Track (m)
East of Union Station	R01	D.1	Condominium Building	60
	R02	D.1	Apartment Building	20
	R03	D.1	Semi-Detached Dwelling	20
	R04	D.1	Apartment Building	75
	R05	D.1	Apartment Building	35
	R06	D.1	Condominium Building	45
	R07	D.1	Condominium Building	90
	R08	D.1	Public Institution	35

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

Existing noise barriers are defined as barriers built as of August 2019 or planned barriers identified during Environmental Assessments completed prior to August 2019. Existing barriers do not include barriers triggered by the 2017 Electrification EPR. No existing acoustical mitigation barriers were identified within the USRC. Topographical model inputs appropriately represent areas along the USRC where the tracks are depressed with respect to the surrounding landscape and retaining walls that border the track ROW.

3.2.3 Union Station Rail Corridor Hydro One Conflicts

Refer to **Figure 1-5** of this Report for the location of Hydro One Conflicts within the USRC.

3.2.3.1 Natural Environment

The 2017 GO Rail Electrification EPR examined the general vicinity of the USRC Hydro One Conflict Areas, however, the study focused on the impact of electrification infrastructure along the corridor. The USRC East Enhancements EPR completed in 2018 documents existing natural features within the study area, including the footprint of the proposed relocation of Hydro One infrastructure.

As a result, a natural environment assessment was completed in April 2018 by AECOM which included background information review of terrestrial and aquatic features and functions of the USRC Hydro One conflict areas and an assessment of the potential effects of the proposed works on the natural environment.

During the 2018 study, available secondary source background information related to the study area was reviewed and/or collected from appropriate sources including, but not limited to:

- Ministry of Natural Resources and Forestry (MNRF) Natural Resource Values Information System (NRVIS) mapping (2011);
- Land Information Ontario (LIO) Areas of Natural and Scientific Interest (ANSI), Wetland and Provincial Parks mapping (2015);
- MNRF Make-a-Map: Natural Heritage Areas Application (2015);
- MNRF NHIC Rare Species Records (2015);
- MNRF Species at Risk in Ontario (SARO) List (2015);
- City of Toronto Official Plan (Consolidated June, 2015);
- City of Toronto Interactive Map;

[34] Figures referenced are included in **Appendix G1.**

- Ontario Breeding Bird Atlas (OBBA) Website (BSC et al., 2006);
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2055);
- Atlas of the Mammals of Ontario (Dobbyn, 1994);
- Bat Conservation International (BCI) Species Profiles (2016);
- Department of Fisheries and Oceans (DFO) Species at Risk Online Mapping Tool (2015);
- Watershed and Subwatershed Plans; and,
- Digital orthoimagery.

Terrestrial and aquatic field investigations were completed during Fall 2018 to gather primary source information and confirm existing information on SAR, vegetation, Significant Wildlife Habitat (SWH), wetland communities (provincially significant and locally significant) and unevaluated wetlands obtained from background information.

3.2.3.1.1 Terrestrial

3.2.3.1.1.1 Wetlands

No wetland features are present within the study area, as per Section 3.1.1 of the 2018 AECOM Natural Environment Report.

3.2.3.1.1.2 Vegetated Areas

The Hydro One conflicts study area is partially comprised of the Mineral Cultural Thicket (CUT1) ecosite Type located along the northern limits of the USRC. Additionally, Mineral Cultural Woodland (CUW1), Moist Old Field Cultural Meadow (CUM1-1), and Cultural Hedgerows (CUH) Ecosites are located just south of the existing Don Fleet JCT.

Relative to the Mineral Cultural Thicket, the trees in these communities covered less than 25% of the landscape and included tree species such as: Manitoba Maple (Acer negundo), Norway Maple (Acre platanoides), and Tree-of-heaven (Ailanthus altissima). Shrub species included Staghorn Sumac (Rhus hirta), Common Buckhorn (Rhamnus cathartica), Gray Dogwood (Cornus racemosa), Russion Olive (Elagnus angustifolia), and Oriental Bittersweet (Celastrus orbiculatus). Ground species make up more than 60% of this community.

3.2.3.1.1.3 Wildlife

Wildlife habitat is limited due to the developed nature of the study area. Those species observed tend to be tolerant of humans and development. A summary of the wildlife observed during the field survey is shown below in **Table 3-4**. It should be noted that terrestrial field investigations were conducted outside of the peak breeding bird and herpetofaunal survey season (i.e., April to June); as such, few incidental wildlife observations were made.

TABLE 3-4: INCIDENTALLY OBSERVED WILDLIFE LIST

Common Name	Scientific Name	Status Under ESA (2007)
Birds		
Black-capped Chickadee	*Poecile atricapillus*	*Not Listed*
Downy Woodpecker	*Picoides pubescens*	*Not Listed*

Common Name	Scientific Name	Status Under ESA (2007)
Birds		
Northern Cardinal	*Cardinalis*	*Not Listed*
Dark-eyed Junco	*Junco hyemalis*	*Not Listed*
American Robin	*Turdus migratorius*	*Not Listed*

3.2.3.1.2 Aquatic

The Don River Valley flows south from the Oak Ridges Moraine, at which point it discharges to Lake Ontario. The river provides suitable cover and fish habitat that is important for migration, feeding and refuge.

3.2.3.1.3 Species at Risk

Six species have the potential to occur within the study area: Barn Swallow, Common Nighthawk, Eastern Wood-pewee, Peregrine Falcon, Chimney Swift, and American Eel.

3.2.3.1.4 Significant Wildlife Habitat

No SWH candidate or confirmed areas were identified within the USRC Hydro One Conflicts study area during previous studies (AECOM 2018).

3.2.3.1.5 Designated Areas

It is acknowledged that the Lower Don River Valley is designated as an Urban River Valley in the 2017 Greenbelt Plan. Additionally, the Don Fleet JCT is located in the City of Toronto's Natural Heritage System.

3.2.3.2 Built Heritage Resources and Cultural Heritage Landscapes

Metrolinx has completed a Cultural Heritage Report (CHR) for the USRC Hydro One Conflict Areas within the City of Toronto. See **Appendix C2** for further details. In 2018, AECOM Canada Ltd. (AECOM) produced cultural heritage screening report documenting cultural heritage landscapes and built heritage resources for the USRC East Enhancements TPAP. According to the report, the structures (i.e., the three (3) USRC subway bridges) show a high degree of craftsmanship in the construction of its steel and concrete work. The structures were built in the 1920s to support expanding transit by facilitating grade separations between the rail lines and city roads. As such, the structures are physically, functionally, and historically linked to the surrounding urban infrastructure and are designated as Provincial Heritage Properties (PHPs).

The CHR includes an inventory of all known or potential built heritage resources (BHRs) and cultural heritage landscapes (CHLs). This assessment addresses above-ground cultural heritage resources over 40 years old. The use of a 40-year-old threshold is a guiding principle when conducting a preliminary identification of cultural heritage resources. Based on the results of the background research and background document reviews, agency data collection and field review, five (5) BHRs and two (2) CHLs were identified within the study areas. Of these, there are four known BHRs, one known CHL, and one potential BHR and one potential CHL that were identified during desktop review. A summary of these are presented in **Table 3-5**.

TABLE 3-5: INTENTORY OF KNOWN AND POTENTIAL BUILT HERITAGE RESOURCES AND CULTURAL HERITAGE LANDSCAPES

BHR/CHL Reference Number	Type of Property	Location	Ownership	Heritage Recognition
BHR-1	Lower Sherbourne Street Subway	Mile 0.75, USRC East	Metrolinx	Known BHR - Provincial Heritage Property
BHR-2	Parliament Street Subway	Mile 1.00, USRC East	Metrolinx	Known BHR - Provincial Heritage Property
BHR-3	Cherry Street Subway	Mile 1.25, USRC East	Metrolinx	Known BHR - Provincial Heritage Property
BHR-4	Cherry Street Tower	385 Cherry Street	Metrolinx	Known BHR - Provincial Heritage Property of Provincial Significance
BHR-5	Eastern Avenue Bridge	Mile 1.84 of Richmond Hill Corridor, east of Corktown Common	City of Toronto	Potential BHR – Identified during Desktop Review
CHL-1	Distillery District Proposed Heritage Conservation District	Border is Parliament Street to the west, railway corridor to the south, Cherry Street to the east, and the buildings on the north side of Mill St. to the north	Various owners	Known CHL – National Historic Site, Proposed Heritage Conservation District, and contains several buildings designated under part IV of the OHA
CHL-2	Bala Underpass Public Space: Commemorative Plaques and 1856 abutments stones as commemorative features	West bank of the Don River, Don River Bicycle Trail just east of Corktown Common at the Bala Underpass	City of Toronto & Toronto and Region Conservation Authority	Potential BHR – Identified during Desktop Review

3.2.3.3 Archaeology

The study area for archaeology was examined during the 2018 USRC East Enhancements TPAP, as well as during the 2017 GO Rail Electrification TPAP. Therefore, a Stage 1 Archaeological Assessment (AA) was completed in November 2018 in accordance with the Standards and Guidelines for Consultant Archaeologists (the S & G).

The Stage 1 AA background study determined that seven previous reports detail archaeological assessments within the USRC Hydro One conflicts study area, specifically:

- Archeological Services Inc. (ASI) conducted a Stage 1 Archaeological Assessment during the Don Mouth Naturalization and Port Lands Flood Protection Project in 2007. The Stage 1 Assessment documented numerous areas of disturbance and demonstrated the study area retained no further areas of archaeological potential.

- Archeological Services Inc. (ASI) conducted a Stage 1 Archaeological Assessment during the West Don Lands Transit Environment Assessment in 2008. The study determined the potential for archaeological remains within the Don Yard would be remote and deeply buried by land-filling due to rail construction.
- Archeological Services Inc. (ASI) prepared an Archaeological Conservation and Management Strategy for the Waterfront Toronto Project in 2008. The report contained an archaeological inventory and an evaluation of archaeological potential based on previous studies. Additionally, recommendations for management strategies for preserving areas of archaeological potential were included. A Stage 2 Archaeological Assessment was recommended for in the eastern portion of the USRC East Study Area.
- Archeological Services Inc. (ASI) prepared a report titled 'Coordinated Provincial Individual/Federal Environmental Assessment and Integrated Urban Design Study' for the Gardiner Expressway and Lake Shore Boulevard Reconfiguration in 2014. This report captured a large study area associated with the Gardiner Expressway which confirms that despite the urbanization of the City of Toronto's waterfront, there are still some areas containing archaeological potential.
- Archaeological Research Associates Ltd. (ARA) completed a Stage 1 Archaeological Assessment for the Cherry Street Interlocking Tower in 2015. No further archaeological work was recommended, as the entire study area was determined to have been disturbed.
- AECOM completed a Stage 1 Archaeological Assessment in 2016 for the Lakeshore East Rail Corridor Expansion. The study covered a portion of the study areas, recommended Stage 2 Archaeological Assessment for areas of archaeological potential, and identified the potential for deeply buried intact archaeological resources. The recommendations outlined in this report have been negated for the areas that cross over with the USRC East Enhancements Project Study Area.
- Archeological Services Inc. (ASI) prepared a report for the GO Rail Electrification TPAP in 2016. The resulting impacts were determined to be minimal in terms of depth, and it was recommended that while the corridor retained potential for deeply buried 19th century structures, the depth of the construction disturbance would not impact these potential remains and no monitoring or further archaeological assessment was required.

The S & G, Section 1.3.1, lists criteria that are indicative of archaeological potential. The USRC Hydro One Conflicts study area meets the following criteria indicative of archaeological potential:

- Previously identified archaeological sites within 1 km;
- Water sources: primary, secondary, or past water source (Don Valley Watershed); and
- Proximity to historic transportation route (Grand Trunk Railway [absorbed by Canadian National Railway], Toronto & Nippissing Railway, Canadian Pacific Railway, and the Toronto Belt Line [now part of the Bala subdivision]).

As part of the USRC East Enhancements project, AECOM confirmed through a visual inspection, analysis of historical sources and digital environmental data, that a small area within the USRC is recommended for a Stage 2 Archaeological Assessment as there is the potential of deeply buried intact archaeological resources.

3.2.3.4 Land Use and Socio-Economic

3.2.3.4.1 Existing Land Use

The USRC Hydro One Conflicts study area is bordered almost exclusively by Mixed Use Areas and Apartment Neighbourhoods on the north side, with Regeneration Areas on the south side. The Don Fleet

JCT is within lands designated as *Parks*, which is associated with the Don River Valley. Additionally, the rail corridor is designated as *Utility Corridor* under the City of Toronto Official Plan.

Corktown Common is a park in close proximity to the rail corridor. Corktown Common includes paths, playgrounds, splash pad, and public facilities for the community to enjoy. Additionally, the Lower Don River Trail extends along the Don River Valley, providing a multi-use path for pedestrian and cyclists to enjoy the surrounding parklands.

The St. Lawrence Co-Op Day Care Inc. is a child-care centre located within 40 m of the rail corridor.

3.2.3.4.2 Planned Land Use

There are three (3) Secondary Plan areas are located in the vicinity of the USRC Hydro One Conflicts Study Area, including:

- King-Parliament (Area 15);
- Central Waterfront (Area 31); and
- Downtown Toronto.

The King-Parliament Secondary Plan Area is targeted for growth in commercial, institutional, industrial, recreational and residential uses. It is intended to promote the retention and expansion of commercial activities, particularly in businesses such as film, media, design and technology. The policies for this specialty area encourage the re-use and enhancement of existing buildings to maintain the characteristics of the neighbourhood. It is noted that the King-Parliament Secondary Plan is currently under review and subject to policy changes.

The Central Waterfront Secondary Plan Area maintains four core principles to help manage the City's waterfront spaces. The first core principal is to remove barriers and enhance connections between the City and Lake Ontario to ultimately achieve the full potential of Toronto's waterfront. The second policy focuses on building a network of waterfront parks and public spaces; to achieve this goal, the City intends to rehabilitate natural waterfront locations for tourism and local enjoyment. The third policy promotes a clean and green waterfront through a variety of environmental and sustainability strategies. Secondary Plan Area policies are working toward creating new, dynamic and diverse waterfront communities for both live-work opportunities. These waterfront communities will be acclaimed for their economic, natural, cultural and environmental characteristics, while contributing to the long-term sustainability of the City.

The USRC Hydro One Conflicts study area is also within the Downtown Toronto Secondary Plan Area, which established policies and minimum density targets to encourage intensification and downtown revitalization.

According to the City of Toronto's Parks and Recreation Facilities Master Plan, there are no planned recreational amenities within the USRC Hydro One Conflicts Study Area.

Under the City of Toronto Zoning By-law 438-86, this portion of the rail corridor is zoned *Utility Corridor*.

3.2.3.5 Visual

Since two (2) existing overhead circuits, one (1) existing underground circuit and one (1) spare circuit are proposed to be relocated to an underground transmission corridor will remain largely in a designated utilities corridor, the visual baseline conditions are classified as *Negligible*.

The relocation of Hydro One transmission infrastructure using utility bridges, however, is expected to have visual effects on the south views of the Lower Sherbourne Street[35], Parliament Street and Cherry Street USRC Bridges. The visual baseline conditions are classified as *High* due to the proposed utility bridges directly adjacent to built heritage resources. Lower Sherbourne Street, Parliament Street and Cherry Street USRC Bridges are each classified as a Provincial Heritage Property. Refer to Section 3.2.3.2 above for further information.

The visual baseline conditions for the new Don Fleet JCT is classified as *Moderate* due to the introduction of utility infrastructure within a scenic/natural area (i.e., the Lower Don Trail). Durisol© walls are required to delineate the new Don Fleet JCT from the Lower Don Trail (to ensure public safety), along with the removal of Hydro One Tower #10A, installation of two (2) new BPEX structures, and overhead connection of two (2) circuits from BPEX structure to Hydro One Tower #9, which is anticipated to impact the viewshed along the Lower Don Trail (west side).

The visual baseline conditions for the existing Don Fleet JCT, however, if classified as *Low* since the utility infrastructure is currently present at this location. The replacement of three (3) existing potheads, and replacement/extension of the existing chain link fence with Durisol© walls to capture the existing Hydro One Tower #9 is anticipated to slightly alter the viewshed along the Lower Don Trail (east side).

In addition, Lower Don Trail, particularly in areas of vegetation/tree clearing within the Corktown Common. A future addendum is to be completed to address environmental assessment requirements; at which time the significance of potential impacts and appropriate mitigation measures will be determined.

3.2.3.6 Utilities

Subsequent to the approval of the GO Rail Network Electrification TPAP in 2017, Hydro One issued the *Transmission Line Relocation Study Report (Phase 2)* for the Rail Corridor Electrification to Metrolinx (December 14, 2018). This report identified conflicts with the proposed Metrolinx OCS infrastructure and the existing Hydro One transmission assets at multiple locations along the rail corridors, including locations within and around the USRC (Mile 0.72E to Mile 1.72E) that were not known at the time of preparing the GO Rail Network Electrification EPR.

Refer to Section 2.3 for additional detail.

3.3 Lakeshore West Rail Corridor

3.3.1 Natural Environment

A Natural Environment Assessment Report (refer to **Appendix A**) was prepared, which details the baseline conditions within the additional study area.

3.3.1.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.1.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

This section of the corridor is located within Ecoregion 7E-4. Surrounding land uses consist primarily of residential, commercial and institutional uses.

[35] The utility bridge is to be affixed to the expanded Lower Sherbourne Street Subway bridge, as documented and approved in the 2018 Union Station Rail Corridor East Enhancements EPR.

3.3.1.2.1 Terrestrial

3.3.1.2.1.1 Wetlands

There are no identified wetlands within this portion of the study area.

3.3.1.2.1.2 Vegetated Areas

The study area contains a large proportion of Commercial and Institutional (CVC) and Transportation and Utility (CVI), as well as some Residential (CVR) communities. The vegetated community within this corridor section is limited to one small Deciduous Woodland (WOD) as well as a Green Land (CGL) and Deciduous Thicket (THD) community.

3.3.1.2.1.3 Wildlife

This study area is comprised of CVC, CVI and CVR lands, therefore no Significant Wildlife Habitat is present within this corridor. However, the small patch of WOD and THD may potentially provide nesting and foraging habitat for breeding birds and common urban mammals.

3.3.1.2.2 Aquatic

No aquatic features are present within this segment of the Project study area.

3.3.1.2.3 Species at Risk

Three species have the potential to occur within the study area: Chimney Swift, Monarch, and Nine-spotted Lady Beetle.

3.3.1.2.4 Significant Wildlife Habitat

No SWH candidate or confirmed areas were identified within this segment of the Project study area during previous studies completed for the 2017 GO Rail Network Electrification EPR (Natural Environment Baseline Conditions Report, Morrison Hershfield [2017]). An updated evaluation determined that candidate habitat is not expected within this segment of the Project study area (NT&F Natural Environment Baseline Conditions Report, Gannett Fleming [2020]).

3.3.1.2.5 Designated Areas

This portion of the study area is located within the jurisdiction of TRCA and Aurora District MNRF. There are no designated areas within this portion of the study area.

3.3.1.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.1.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.1.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.1.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.1.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.1.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

This section of the corridor is located within Ecoregion 7E-4.

3.3.1.8.1 Terrestrial

3.3.1.8.1.1 Wetlands

There are no wetlands within the Walkers Line Layover site.

3.3.1.8.1.2 Vegetated Areas

The study area near Walkers Line Layover contains a large proportion of Transportation and Utilities (CVI) and Commercial and Institutional lands (CVC). The vegetated communities within this corridor section are Cultural Meadow (CUM), Agriculture (AG), and Deciduous Woodland (WOD). Open Aquatic (OA) areas are present at Shoreacres Creek and Tuck Creek.

3.3.1.8.1.3 Wildlife

Shoreacres and Tuck Creeks may provide suitable migratory corridors for herpetofauna and the small patches of WOD may provide foraging and nesting habitat for breeding birds. The AG communities may potentially provide nesting and foraging habitat for grassland birds.

3.3.1.8.2 Aquatic

There are four watercourses within this segment. Shoreacres Creek, Tuck Creek, Roseland Creek, and Indian Creek are all found within the Burlington Urban Creeks Watershed. Shoreacres Creek runs through the Walkers Line Layover, while Tuck Creek is located approximately 280 m west of the Walkers Line Layover study area; Roseland Creek and Indian Creek are not located within proximity to the layover.

Fish species previously captured or noted as occurring in Shoreacres Creek within the vicinity of the proposed Layover include: Eastern Blacknose Dace, Longnose Dace, Bluntnose Minnow, Creek Chub and Fathead Minnow. White Sucker and Creek Chub were observed in 2020 (NT&F Natural Environment Baseline Conditions Report, Gannett Fleming [2020]).

3.3.1.8.3 Species at Risk

There is moderate potential for Butternut to be present within the WOD communities. While there is suitable habitat for Eastern Flowering Dogwood and American Chestnut within the WOD communities, there is a low potential of occurrence. There is a moderate potential for Barn Swallow to be present on or around bridge structures over OA areas or areas adjacent to OA. There is suitable habitat for Chimney Swift within the corridor, however there is low potential of occurrence within the study area as Chimney Swift are found within chimney structures that are part of the CVC. There is moderate potential for Red-headed Woodpecker within the WOD communities within the study area. Suitable habitat for Bobolink and Eastern Meadowlark exists within the AG communities; however, there is a low potential for occurrence. There is a low potential for Monarch to occur within the CVI and CUM communities within this portion of the study area.

Four bat species have suitable habitat within the study area. There is moderate potential for Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis and Tri-coloured Bat to occur within the WOD communities.

3.3.1.8.4 Significant Wildlife Habitat

No SWH candidate or confirmed areas were identified within this segment of the Project study area during previous studies completed for the 2017 GO Rail Network Electrification EPR (Natural Environment Baseline Conditions Report, Morrison Hershfield [2017]).

3.3.1.8.5 Designated Areas

No provincially or municipally designated features are present within this segment of the Project study area. A portion of the study area is located within the jurisdiction of Conservation Halton (CH).

3.3.2 Preliminary Environmental Site Assessment

A Preliminary Environmental Site Assessment (refer to **Appendix B**) was prepared for new layover facilities, which details the baseline conditions within the additional study area. Details on the assessment of additional OCS infrastructure along the corridor is provided below, where applicable.

3.3.2.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.2.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

3.3.2.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.2.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.2.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.2.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.2.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.2.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

Six (6) Areas of Potential Environmental Concern (APEC) were identified for the subject property. The Potentially Contaminating Activities (PCAs) identified at the subject property or at properties within the 250 metre (m) buffer study area included the following:

- Storage, Maintenance, Fueling and Repair of Equipment, Vehicles, and Material Used to Maintain Transportation Systems;
- Gasoline and Associated Products Storage in Fixed Tanks;
- Importation of Fill of an Unknown Quality;
- Pulp, Paper and Paperboard Manufacturing and Processing;
- Plastics (including fiberglass) Manufacturing and Processing;
- Salvage Yard, including Automobile Wrecking
- Glass Manufacturing;
- Metal Treatment, Coating, Plating and Finishing; and
- Textile Manufacturing and Processing.

Other potential environmental concerns that were identified as contributing to the APEC included industrial manufacturing activities since prior to mid-1980s, registrable waste generation associated with current land use and industrial manufacturing facilities (including light fuel and halogenated solvents), and the presence of storage tanks.

A detailed list of APECs and PCAs can be found in **Appendix B – Attachment 1**.

3.3.3 Built Heritage Resources and Cultural Heritage Landscapes

Please refer to **Appendix C1** for a description of methodology followed for identification of potential cultural heritage resources within the additional study area.

3.3.3.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.3.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

No Built Heritage Resources (BHRs) or Cultural Heritage Landscapes (CHLs) are located within the rail corridor or the 30m buffer.

3.3.3.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.3.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.3.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.3.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.3.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.3.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

No BHRs or CHLs are located within the rail corridor or the 30m buffer around the Walkers Line Layover location.

3.3.4 Archaeology

A review of the historic land use of the Lakeshore West Corridor indicates that it has been occupied by Indigenous peoples for thousands of years. It is situated within the traditional territories occupied by the ancestral Huron-Wendat and Iroquoian populations who are generally accepted to be ancestral to the Neutral Nations. The north shore of Lake of Ontario was abandoned by ancestral Huron-Wendat populations near the turn of the sixteenth century while Neutral Nation populations occupied the region of the head of Lake Ontario until the early-mid seventeenth century. The corridor was subsequently occupied by the Seneca First Nation until the late seventeenth century; and, subsequently occupied by the Mississauga First Nation until 1795 (Aboriginal Affairs and Northern Development Canada [AANDC] 2013b; 2013c; 2013d; Benn 2008; Birch 2015; Ellis 2013; Williamson 2013). The background research also acknowledges that, since the turn of the eighteenth century, the Métis have lived throughout the Province of Ontario but are often muted in the historical record (MNC n.d.; Stone and Chaput 1978: 607,608).

Since 1784, the corridor has been occupied by Euro-Canadian peoples and is situated within the former Township of East Flamborough, County of Wentworth; since 1795 within the former Township of Nelson, County of Halton; since 1805 within the former Townships of Etobicoke and York, County of York; and, since 1806 within the former Township of Trafalgar, County of Halton and the former Township of Toronto, County of Peel (Benn 2008; Boulton 1805; Pope 1877a; 1877b).

Please see **Appendix D** for a copy of the Stage 1 Archaeological Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.3.4.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.4.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

Section LSW-2 meets the following criteria which are indicative of archeological potential:

- Proximity to Euro-Canadian Settlement (Mimico);
- Proximity to historic transportation routes (Great Western Railway, Kipling Avenue, Lakeshore Road);
- Proximity to historic features (farmhouse); and
- Proximity to water source (Lake Ontario, Etobicoke Creek).

According to the OASD (MHSTCI 2019), no previously registered archaeological sites are located within one kilometre of the study area.

This section was subject to at least one previous stage 1 archaeological assessment (ASI 2017a), completed as part of the 2017 GO Rail Network Electrification TPAP, which determined that no further archaeological assessment was required for the 2017 OCS Impact/Vegetation Clearance Zone footprint.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.3.4.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.4.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.4.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.4.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.4.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.4.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

The Walkers Line Layover Location study area is located in Borden block *AiGw*. According to the OASD eight previously registered archaeological sites are located within 1 km of the study area, none of which are located within 50 m. Site details are presented below in **Table 3-6**.

TABLE 3-6: WALKERS LINE LAYOVER - PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AiGw-82	George Alton	Archaic	Unknown	Arthur Roberts 1976
AiGw-83	Ross Segsworth	Pre-Contact Indigenous	Findspot	Arthur Roberts 1976
AiGw-87	George Richardson	Archaic	Unknown	Arthur Roberts 1976
AiGw-88	Appleby Line	Paleo; Archaic; Woodland		Arthur Roberts 1976
AiGw-90	Baseball Diamond	Archaic	Unknown	Arthur Roberts 1976
AiGw-91	Misfit Creek Valley	Archaic	Camp/campsite	Arthur Roberts 1976
AiGw-92	Misfit Creek Valley 2	Archaic	Unknown	Arthur Roberts 1976
AiGw-93	West Misfit Bank	Archaic	Unknown	Arthur Roberts 1976

According to the background research, two previous ASI report details fieldwork within 50 m of the Walkers Line Location study area.

- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016

- (ASI 2019b) Stage 1 Archaeological Assessment, Mobility Hub Planning Consulting Services: Appleby, Lots 2-7, Concession III SDS, (Former Township of Nelson, County of Halton), City of Burlington, Regional Municipality of Halton, Ontario P094-0276-2018

The S & G, Section 1.3.1, lists criteria that are indicative of archaeological potential. Walkers Line Layover Location meets the following criteria indicative of archaeological potential:

- Previously identified archaeological sites;
- Water sources: primary, secondary, or past water source (Shoreacres Creek);
- Early historic transportation routes (Walkers Line); and
- Proximity to early settlements (Appleby).

These criteria are indicative of potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.3.5 Land Use and Socio-Economic

Please see **Appendix E** for a copy of the Land Use and Socio-Economic Assessment Report, which details the baseline conditions within the additional study area.

From Union Station, the Lakeshore West Corridor is primarily urban, passing through the southwest end of Toronto, then through the City of Mississauga, Town of Oakville and City of Burlington. The route includes two regional municipalities (Peel Region and Halton Region). Land uses are primarily designated as *Low Density Residential with Employment* Areas located to the north of the corridor. Many parks exist alongside the rail corridor and are typically surrounded by residential neighbourhoods.

There are no sensitive facilities located within approximately 100 metres of the Lakeshore West Corridor.

3.3.5.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.5.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

3.3.5.2.1 Existing Land Use

This section of the rail corridor is bordered almost exclusively by *Employment Areas* on the north side, with *Employment Areas*, *Neighbourhoods*, *Parks*, *Mixed Use Areas*, and *Apartment Neighbourhoods* on the south side. Long Branch GO Station is adjacent to some of the *Natural Areas* associated with Etobicoke Creek. Official Plan Land use designations along this section of the rail corridor is shown in **Figure LSW-10** in **Appendix E**.

There are two large parks in close proximity to the rail corridor: Laburnham Park and Don Russel Memorial Park. Laburnham Park includes tennis courts, while Don Russell Memorial Park includes sporting amenities such as a baseball field as well as a warehouse building directly adjacent to the rail corridor.

There are no hospitals, schools, places of worship, child-care centres or long-term care centres in the vicinity of the rail corridor.

3.3.5.2.2 Planned Land Use

There are no Secondary Plans affecting the lands adjacent to the rail corridor. According to the City of Toronto's Parks and Recreation Facilities Master Plan, there are no planned recreational amenities within this segment of the rail corridor.

Under the City of Toronto Zoning By-law 569-2013, this portion of the rail corridor is zoned for Utility and Transportation.

3.3.5.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.5.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.5.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.5.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.5.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.5.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

Within the vicinity of the proposed Walkers Line Layover, surrounding land uses are designated as *Employment/Industrial, Commercial and Mixed use areas*. The Walkers Line Layover is situated on lands primarily designated as *General Employment* which permits transportation uses.

3.3.5.8.1 Existing Land Use

Sidewalks extend north and south on both sides of Walkers Line, on the south side of Harvester Road and along Fairview Street. According to the City of Burlington Cycling Plan, there is an existing multiuse path south of Fairview Street along Walkers Line.

3.3.5.8.2 Planned Land Use

Under the City of Burlington Zoning By-law 2020, this section of the rail corridor is zoned as *Utility Services.*

3.3.6 Air Quality

Since 2017, Metrolinx has made significant changes to the planned rail infrastructure and train service for the GO Expansion Program, of which Electrification forms a part. The potential air quality impacts of trains and associated equipment and infrastructure have been assessed at both the regional scale, and locally in those segments of the corridors which are expected to experience an increase in diesel (i.e. non-electrified) powered equipment activity relative to the 2015 (pre-project or baseline) levels and which have sensitive receptors exposed to the rail corridor. While diesel service levels will remain the same or decrease (with electric train service taking up the planned increased service levels), there will be an increase in the number

of diesel locomotives operating on some corridors. This is due to the need to power diesel trains with two locomotives rather than one during peak periods.

On the LSW Corridor, increased service levels will be achieved by adding electrified trains and diesel train traffic levels will either remain the same or decrease in future. As such, an assessment of local air quality impacts was not undertaken.

A description of regional air quality baseline conditions is included in Section 4.8.7, and the Regional Air Quality Study Report (refer to **Appendix F1**) details baseline conditions within the project area.

3.3.7 Noise and Vibration

The noise and vibration baseline conditions within the additional study area for this discipline are detailed in **Appendix G2**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.2.

The LSW Corridor Study Area for the noise and vibration assessment begins at Strachan Avenue (Mile 1.57, west of Bathurst Street) and ends approximately 1 km west of the Burlington GO Station, approximately 49 km in length. This varies slightly from the LSW Corridor limits used for other assessments within this report, which start at Mile 1.20 (west of Bathurst Street). Trains passing through the LSW Corridor to stations beyond the Study Area (i.e., Aldershot GO Station, West Harbour GO Station, Hamilton GO Station) have been included in the Study Area shown in **Figure 3-3**. The CANPA Subdivision branches off the LSW Corridor approximately 1.5 km west of the Willowbrook Rail Maintenance Facility and runs approximately 5 km north to join the Milton Rail Corridor.

For the existing operations, twenty-two trains are stored at the Willowbrook Rail Maintenance Facility Layover site. All trains were assumed to have consists of 1DL12.

For the future operations, a total of 36 trains layover along the LSW Corridor. 21 trains are stored at the Willowbrook Rail Maintenance Facility layover site, 6 trains are stored at the Mimico South Layover and 9 trains are stored at the proposed Walkers Line Layover. The distribution of train consist types at the layovers was assumed based on consist type breakdowns for operational trains on the Corridor, as follows:

- Willowbrook Rail Maintenance Facility: 6 x 1DL6, 9 x 2DL12, 1 x 1EL6, and 5 x 2EL12;
- Mimico South Layover Site: 1 x 2DL12, 2 x 1EL6, and 3 x 2EL12; and
- Walkers Line Layover Site: 1 x 1EL6, and 8 x 2EL12.

GO trains are assumed to idle for greater than 60 minutes at all of the layover sites along the LSW Corridor. The engines are set to idle for the purposes of heating or cooling prior to scheduled dispatch or for maintenance purposes.

Noise receptors for this assessment include the following sensitive land uses:

- Residences;
- Hotels, motels and campgrounds;
- Schools, universities, libraries and daycare centres;
- Hospitals and clinics, nursing / retirement homes;
- Churches and places of worship;
- Planned residential developments with approved building permits from the Municipality; and
- Vacant lots that are currently zoned for residential use.

Noise receptors within the Study Area are mainly residential houses located adjacent to the LSW Rail Corridor. In general, areas of receptors were identified using publicly available address point databases or through visual identification using publicly available satellite aerial images.

In the 2017 EPR, vacant lots were only assessed for residential developments with approved building permits. In this addendum, all vacant lots that are zoned for residential use (with or without building permits) were included in the assessment. All vacant residential lots within the Study Area were considered.

Representative noise receptors were chosen to simplify the presentation of results for a much larger number of receptors assessed. The representative noise receptors are summarized in **Table 3-7** and **Table 3-8**. Complete mapping of noise receptors is included in **Appendix G.**

For the assessment of vibration, the proximity of all noise receptors within the LSW Corridor to changes in track alignment or special trackwork was assessed. The following areas were identified as areas of investigation for operational vibration:

- Approximately 1 km of future fifth track between Strachan Avenue and Exhibition GO Station[36];
- Approximately 300 m of future track east of Canpa Subdivision;
- Approximately 325 m of future track east of Appleby GO Station; and
- 95 new switches along the Corridor.

Receptors for vibration include the same sensitive land uses as described in the noise assessment. However, future development locations that did not have approval for residential uses were not included since they would need to be designed to achieve appropriate vibration levels with the future rail infrastructure in place. The point of evaluation is defined as 5 to 10 m from the building foundation in a direction parallel to the tracks.

[36] This section of future track was not assessed as part of the NT&F TPAP and would be subject to separate EA approvals. However, as this track is located within the OCS/Vegetation Clearance Zone assessed as part of the 2017 GO Rail Network Electrification EPR, no further assessment is required as part of this EPR Addendum

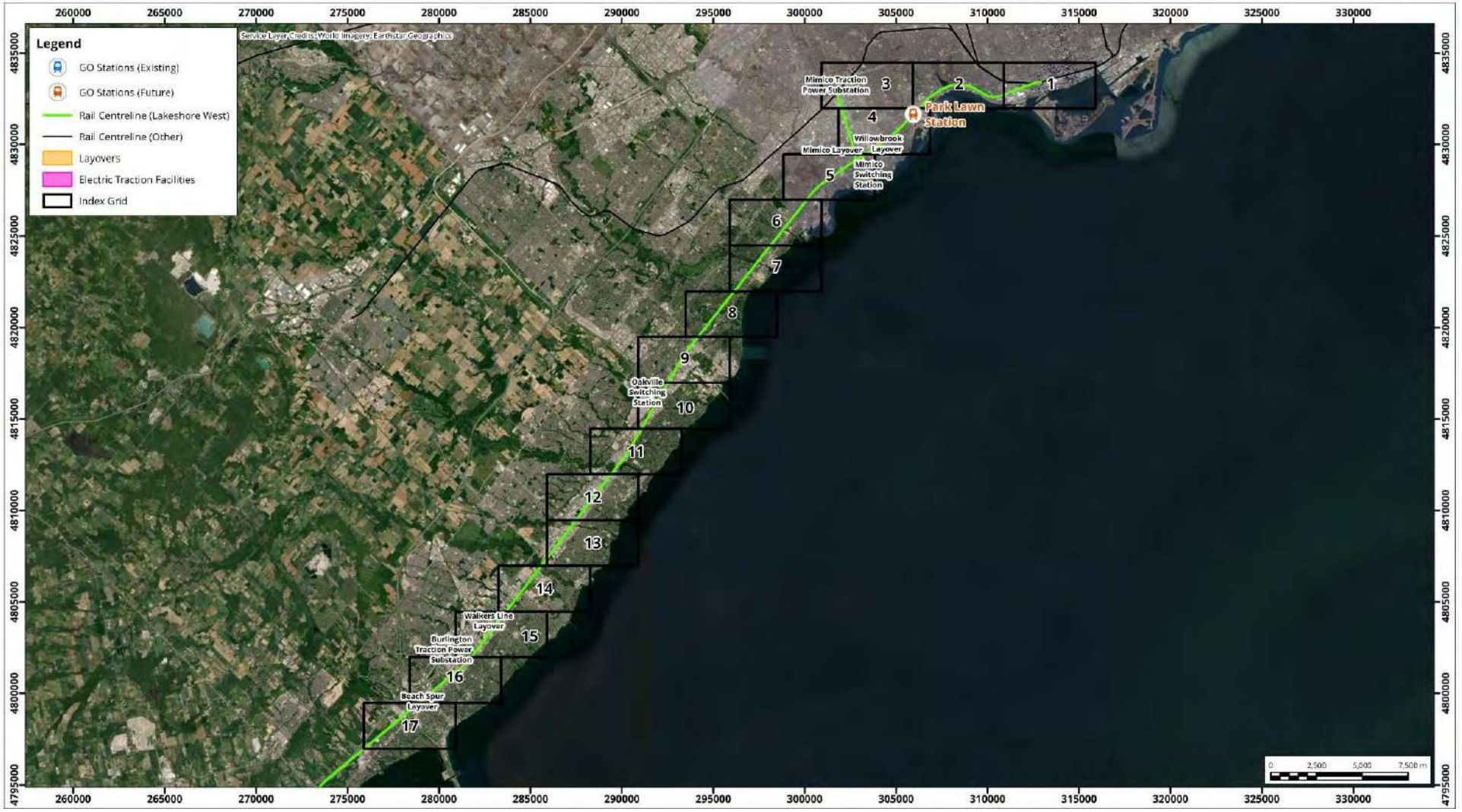

FIGURE 3-3: LAKESHORE WEST NOISE & VIBRATION STUDY AREA

TABLE 3-7: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS - EXHIBITION GO TO PORT CREDIT GO

Track Section	Receptor ID[1]	Figure[37]	Description	Receptor Distance from Nearest Track (m)
Exhibition GO to Park Lawn GO	R01	D.1.1	Condominium Building	30
	R02	D.1.1	Single Detached Dwelling	80
	R03	D.1.2	Single Detached Dwelling	130
	R04	D.1.2	Apartment Building	60
Park Lawn GO to Mimico GO	R05	D.1.2	Condominium Building	60
	R06	D.1.2	Condominium Building	90
	R07	D.1.4	Condominium Building	270
	R08	D.1.4	Townhouse	210
	R09	D.1.4	Townhouse	70
Mimico GO to Willowbrook	R10	D.1.4	Single Detached Dwelling	50
	R11	D.1.4	Single Detached Dwelling	120
	R12	D.1.4	Townhouse	150
	R13	D.1.4	Single Detached Dwelling	130
	R14	D.1.4	Single Detached Dwelling	50
	R15	D.1.4	Single Detached Dwelling	20
	R16	D.1.4	Single Detached Dwelling	20
	R17	D.1.4	Single Detached Dwelling	20
Canpa Subdivision	R78	D.1.3	Apartment Building	170
	R79	D.1.3	Apartment Building	190
	R80	D.1.4	Townhouse First Floor	250
Willowbrook to Long Branch GO	R18	D.1.4 / D.1.5	Single Detached Dwelling	80
	R19	D.1.5	Townhouse	60
	R20	D.1.5	Single Detached Dwelling	50
	R21	D.1.5	Single Detached Dwelling	60
	R22	D.1.5	Single Detached Dwelling	90
	R23	D.1.5	Single Detached Dwelling	50
	R24	D.1.5	Single Detached Dwelling	30
Long Branch GO to Port Credit GO	R25	D.1.5	Single Detached Dwelling	310
	R26	D.1.5	Single Detached Dwelling	140
	R27	D.1.5	Single Detached Dwelling	200
	R28	D.1.5 / D.1.6	Single Detached Dwelling	290
	R29	D.1.5 / D.1.6	Single Detached Dwelling	300
	R30	D.1.6	Townhouse	410
	R31	D.1.6	Single Detached Dwelling	200
	R32	D.1.6	Single Detached Dwelling	260
	R33	D.1.6	Single Detached Dwelling	210
	R34	D.1.6	Single Detached Dwelling	310

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

[37] Figures referenced are included in **Appendix G2.**

TABLE 3-8: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS - PORT CREDIT GO TO BURLINGTON GO

Track Section	Receptor ID[1]	Figure[38]	Description	Receptor Distance from Nearest Track (m)
Port Credit GO to Clarkson GO	R35	D.1.6 / D.1.7	Condominium Building	220
	R36	D.1.7	Single Detached Dwelling	60
	R37	D.1.7	Single Detached Dwelling	30
	R38	D.1.7	Single Detached Dwelling	40
	R39	D.1.7	Single Detached Dwelling	60
	R40	D.1.7	Townhouse	60
	R41	D.1.7 / D.1.8	Single Detached Dwelling	40
	R42	D.1.7 / D.1.8	Townhouse	90
	R43	D.1.7 / D.1.8	Single Detached Dwelling	160
	R44	D.1.8	Single Detached Dwelling	170
	R45	D.1.8	Single Detached Dwelling	30
	R46	D.1.8	Single Detached Dwelling	110
	R47	D.1.8	Single Detached Dwelling	50
	R48	D.1.8	Single Detached Dwelling	20
	R49	D.1.8	Condominium Building	20
	R50	D.1.8 / D.1.9	Single Detached Dwelling	20
Clarkson GO to Oakville GO	R51	D.1.8 / D.1.9	Townhouse	30
	R52	D.1.9	Single Detached Dwelling	50
	R53	D.1.9	Single Detached Dwelling	50
	R54	D.1.10	Single Detached Dwelling	40
	R55	D.1.10	Single Detached Dwelling	50
	R56	D.1.10 / D.1.11	Single Detached Dwelling	30
	R57	D.1.11	Single Detached Dwelling	50
Oakville GO to Bronte GO	R58	D.1.11	Condominium Building	60
	R59	D.1.11	Apartment Building	40
	R60	D.1.11 / D.1.12	Single Detached Dwelling	50
	R61	D.1.12	Single Detached Dwelling	30
	R62	D.1.12	Single Detached Dwelling	30
	R63	D.1.12 / D.1.12	Single Detached Dwelling	190
Bronte GO to Appleby GO	R64	D.1.13	Single Detached Dwelling	420
	R65	D.1.13 / D.1.14	Townhouse	110
	R66	D.1.14	Townhouse	70
Appleby GO to Burlington GO	R67	D.1.14 / D.1.15	Townhouse	340
	R68	D.1.15	Townhouse	350
	R69	D.1.15	Townhouse	500
	R70	D.1.15	Single Detached Dwelling	300
	R71	D.1.15 / D.1.16	Townhouse	150
	R72	D.1.16	Single Detached Dwelling	230
	R73	D.1.16	Single Detached Dwelling	230
	R74	D.1.16	Single Detached Dwelling	100
	R75	D.1.16	Single Detached Dwelling	90
	R76	D.1.16	Apartment Building	230
	R77	D.1.16 / D.1.17	Apartment Building	40

[38] Figures referenced are included in **Appendix G2.**

Existing noise barriers are defined as barriers built as of August 2019 or planned barriers identified during Environmental Assessments completed prior to August 2019. Existing barriers in some cases include barriers triggered by the 2017 Electrification EPR. Existing barriers were included in the Pre-project, and Post-project modelling scenarios. The replacement of existing or planned noise barriers located on the Metrolinx Right-of-Way was not considered in this assessment. Mitigation was therefore not investigated in locations with existing or planned barriers. However, filling in of gaps between existing noise barriers and horizontal extensions of these barriers were investigated, subject to technical and economic feasibility.

3.3.8 Visual

Please see **Appendix H** for a copy of the Visual Assessment Report, which details the baseline conditions assessment.

The following section provides an overview of the methodology followed to collect and document visual/aesthetics baseline conditions information within the Study Area, which were then used to develop appropriate mitigation/compensation/enhancement measures as detailed in **Section 4**. The analysis of potential visual impacts relied on available aerial photography, field visits in select locations, and existing GIS mapping layers.

The following categories were used to classify and document visual baseline conditions within the Study Area:

- **Negligible Impact Areas** which are considered not visually sensitive (where no mitigation is warranted), such as:
    - Proposed layover facility /storage yard infrastructure is located within or in the vicinity of industrial/employment/commercial areas;
    - Areas where there are no residential areas or no areas where people congregate in proximity to the rail corridors where OCS infrastructure is proposed; and/or
    - Proposed track infrastructure is within the existing railroad ROW.
- **Low Impact Areas** which have minimal visual sensitivity and where there are minor impacts which may warrant some mitigation, such as:
    - Proposed layover facility/storage yard infrastructure located in residential areas where homes are more than 20 metres away from the proposed infrastructure (20 metres was chosen because rear yards that are longer than approximately 20 metres typically contain vegetation that helps to screen views of the rail corridor and new OCS infrastructure placed within the corridor);
    - Visual impacts due to OCS installation on the corridors where views to the corridor are not considered of scenic value or have already been degraded by other infrastructure intruding into views; and/or
    - Proposed infrastructure is located in the vicinity of *Mixed-Use* areas.
- **Moderate Impact Areas** where sensitive views are compromised and impacts should be minimized/mitigated where feasible, such as:
    - Areas and overpasses where there are scenic views or scenic and natural areas that will be altered by the introduction of OCS structures;
    - Areas where high-rise buildings in a natural setting are closer than 30 metres from the proposed infrastructure (30 metres was chosen as the distance where

views from low storeys, but not necessarily the lowest storey, of buildings would be significantly altered from view of natural vegetation to views of OCS infrastructure);

- Residential areas where homes are between 8 and 20 metres away from the proposed infrastructure (20 metres was chosen because rear yards that are longer than approximately 20 metres typically contain vegetation that helps to screen views of the corridor and new OCS infrastructure placed within the corridor); and/or
- Rural farmland.

- **High Impact Areas** where views are considerably compromised and should be minimized/mitigated to the extent possible, such as:
  - Residential areas where homes are within 8 metres from the proposed infrastructure (8 metres was selected as the distance where the rear of homes were so close to the rail corridor that privacy could be compromised due to the removal of vegetation for OCS infrastructure);
  - Scenic, cultural or historic features/environments directly adjacent to the proposed infrastructure; and/or
  - Environmental protected and natural areas directly adjacent to the proposed infrastructure.

The Lakeshore West Corridor follows the Gardiner Expressway along the lakefront. From the point where the expressway leaves the lakefront, the corridor continues through employment/industrial and residential neighborhoods for its entire length.

3.3.8.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.8.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

A segment within this section, mile 9.10 to mile 8.60, passes through industrial developments on the north side of the rail ROW. A residential neighbourhood with multiple dwelling units are located to the south, approximately 20 metres from the rail ROW (see **Figure 3-4**). The proposed track upgrades are proposed to occur within the existing Metrolinx rail ROW resulting in minimal changes to existing views because there is no change to the vertical profile of the existing track bed. Therefore, the visual baseline conditions are classified as Negligible due to the minimal disturbance caused by the proposed track work.

FIGURE 3-4: RESIDENTIAL DEVELOPMENT SOUTH OF ROW NEAR CANPA SUBDIVISION (LOOKING NORTH)[39,40]

3.3.8.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.8.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.8.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.8.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.8.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

[39] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange; Metrolinx-owned property is depicted in red.
[40] Previously approved electrification infrastructure, including Tap/TPF sites and feeder routes (as applicable) are not depicted

3.3.8.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

The surrounding properties are primarily *Commercial* and *Employment* lands, with the exception of Shoreacres Creek, a natural area that is regulated by Conservation Halton (see **Figure 3-5** and **Figure 3-6**). For the purposes of this study, this report focuses on viewpoints from visual receptors in the surrounding area, as discussed below.

The visual impact due to the proposed OCS infrastructure on commercial/employment lands is considered Negligible as the proposed storage tracks are contained within Metrolinx's existing ROW and industrial buildings are likely to block views from surrounding roadways. Therefore, views of the Walkers Line Layover Facility are largely limited to parking lots located behind commercial buildings.

There is, however, anticipated impacts due to the construction of the Walkers Line Layover facility, including OCS infrastructure (i.e., facility will impact the composition and character of current views experienced by visual receptors along Shoreacres Creek resulting in High visual impacts). It is anticipated that views will be altered due to the proposed OCS infrastructure, specifically, views from the creek below.

FIGURE 3-5: EXISTING SHOREACRES CREEK – SOUTH VIEW OF CULVERT UNDER THE RAIL CORRIDOR

FIGURE 3-6: EXISTING SHOREACRES CREEK - VIEW LOOKING NORTH

3.3.9 Utilities

Please see **Appendix I** for a copy of the Utilities Assessment Report, which details the baseline conditions assessment.

3.3.9.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.9.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

3.3.9.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.9.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.9.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.9.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.9.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.9.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

Refer to **Figure LSW-4** and **Figure LSW-5** in **Appendix I**. The following utilities have been identified within the study area.

TABLE 3-9: WALKERS LINE LAYOVER IDENTIFIED UTILITIES

UID	Site Names	Mile Start	Mile End	Nearest Street	Owner Name	Utility Class	Description	Size	Material
11414	Union Station; Lakeshore West; Burlington; Mimico SWS; Ordnance SWS	0.54	34.26	Lower Jarvis St to Waterdown Rd	Telus	UG - Parallel	Communication Cable	144F	Fiber
21479	Union Station; Lakeshore West; Mimico SWS; Oakville SWS; Ordnance SWS	1.24	32.07	Long Branch GO Station to Chartwell Rd.	Rogers	UG - Parallel	Communication Cable	2 cables	Fiber

UID	Site Names	Mile Start	Mile End	Nearest Street	Owner Name	Utility Class	Description	Size	Material
21321	Union Station; Lakeshore West; Mimico SWS; Oakville SWS; Ordnance SWS	1.75	29.53	Dowling Ave to Brant St.	Zayo	UG - Parallel	Communication Cable	Unknown	Fiber
21521	Lakeshore West; Oakville SWS	17.91	32.07	Winston Churchill Blvd to King Rd	Cogeco Connexion	UG - Parallel	Communication Cable	12F, 84F	Fiber
21126	Lakeshore West; Burlington	21.58	34.63	Lyons Lane to Waterdown Rd	Bell	UG - Parallel	Communication Cable	Unknown	Plastic
22168	Lakeshore West	28.43	28.45	Fairview St	City of Burlington	UG - Parallel	Storm Sewer	450mm	Concrete
22105	Lakeshore West	28.43	28.43	Walkers Line	Unknown	UG - Crossing	Culvert	300mm	Unknown
22170	Lakeshore West	28.49	28.57	Fairview St	City of Burlington	UG - Parallel	Storm Sewer	900mm	Concrete
22169	Lakeshore West	28.45	28.49	Fairview St	City of Burlington	UG - Parallel	Storm Sewer	600mm	Concrete
21347	Lakeshore West	28.49	28.49	South Service Rd	City of Burlington	UG - Crossing	Storm Sewer	1050mm	Unknown
22171	Lakeshore West	28.57	28.65	Fairview St	City of Burlington	UG - Parallel	Storm Sewer	825mm	Concrete
21530	Lakeshore West	28.65	28.66	Appleby Line	Cogeco Connexion	UG - Crossing	Communication Cable	12F	Fiber

UID	Site Names	Mile Start	Mile End	Nearest Street	Owner Name	Utility Class	Description	Size	Material
21383	Lakeshore West	29.01	29.01	Walkers Line	Halton Region	UG - Crossing	Sanitary Sewer	1370mm casing, 825mm pipe	Concrete in Steel Casing
21811	Lakeshore West	29.02	29.02	Griffith Ct	City of Burlington	UG - Crossing	Culvert	1200x 3200mm	Concrete
20233	Lakeshore West	29.47	29.50	Walkers Line	Burlington Hydro	UG - Parallel	Conductor (Distribution)	13800-3PH	Unknown
20237	Lakeshore West	29.49	29.49	Walkers Line	Burlington Hydro	OH - Crossing	Conductor (Distribution)	16000-RPH	Metallic
20923	Lakeshore West	29.49	29.50	Walkers Line	Bell	UG - Crossing	Communication Cable	6x90mm	Concrete
21522	Lakeshore West	29.49	30.15	Walkers Line to Cumberland Ave	Cogeco Connexion	UG - Parallel	Communication Cable	12F, 60F, 60F	Fiber
22226	Lakeshore West	29.49	29.53	Walkers Line	Cogeco Connexion	OH - Parallel	Communication Cable	36F	Fiber
21334	Lakeshore West	29.49	29.50	Walkers Line	Halton Region	UG - Crossing	Sanitary Sewer	525mm	Concrete
21333	Lakeshore West	29.50	29.50	Walkers Line	City of Burlington	UG - Crossing	Storm Sewer	750mm	Unknown
20239	Lakeshore West	29.50	29.58	Walkers Line	Burlington Hydro	OH - Parallel	Conductor (Distribution)	27600-3PH	Metallic
21336	Lakeshore West	29.52	29.52	Walkers Line	City of Burlington	UG - Crossing	Storm Sewer	300mm	Concrete

3.3.10 EMI & EMF

Please see **Appendix J** for a copy of the EMI & EMF Assessment Report, which details the baseline conditions assessment completed.

3.3.10.1 EMI Sensitive Sites

Based on the baseline mapping for Lakeshore West Corridor, one EMI sensitive site was identified within Zone 3 or closer (i.e., less than 100 metres from the closest track) or between 100 metres and 250 metres (the conservative evaluation zone) from the corridor, as shown in **Table 3-10**. This was added to the list of candidate sites at which to collect baseline EMI scans during the impact assessment phase.

TABLE 3-10: EMI SENSITIVE SITES NEAR THE LAKESHORE WEST CORRIDOR

EMI Sensitive Site	Type	Coordinates	Distance to Closest Track
Burgess Veterinary Emergency	Hospital	43°21'23.1"N, 79°47'04.5"W	Less than 100m

3.3.10.2 ELF EMF Measurements

The tables in Section 4.2.3.2 to Section 4.2.3.9 in the 2017 Electrification EMI/EMF Baseline Conditions Report (Appendix J1 of 2017 EPR) present the ELF EMF measurements at select points along the Lakeshore West Corridor. There was one high-ELF (> 10 mG) area along this section of the corridor, as shown in **Table 3-11**. **Figure 3-7** shows an aerial view of this location in relation to the study area. This is a location where post-electrification measurement of ELF EMF is recommended.

TABLE 3-11: SUMMARY OF HIGH ELF (>10MG) AREAS ALONG THE LAKESHORE WEST CORRIDOR

Area of Interest	Coordinates	Resultant Flux Density Magnitude (mG)	References
Three metres from centre of track	43°21'09.8"N, 79°47'25.4"W	11.3	**Figure 3-7**

FIGURE 3-7: ELF SITES IN LAKESHORE WEST – 3 METRES FROM CENTER OF TRACK IN RELATION TO STUDY AREA

3.3.11 Stormwater Management

Please see **Appendix K** for a copy of the Preliminary Stormwater Management Report, which details the baseline conditions assessment completed for this discipline.

3.3.11.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.11.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

Quantity and drainage patterns are not anticipated to be affected by electrification infrastructure proposed along the corridor based on the preliminary analysis undertaken as part of the conceptual design work.

3.3.11.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.11.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.11.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.11.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.11.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.11.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

Preliminary information regarding regulated limits in proximity to the Walkers Line Layover is presented in **Figure 3-8,** and existing drainage conditions are shown in **Figure 3-9**.

The total Layover Assessment Area is approximately 11.59 ha consisting of existing railroad tracks/ballast, industrial areas and undeveloped land. The portion of the property parcel affected by the development of the layover site, including OCS infrastructure will be approximately 11.59 ha as shown on **Figure 3-8**. In the subsequent sections of this report, only the area affected by the development is considered for the analysis.

Available topographic information indicates the overall site drains towards Shoreacres Creek from both Appleby Line and Walkers Line. Topographic information is supplemented with elevations from the City of Burlington contour data where there are data gaps (i.e. to obtain elevations from within the private property). Existing drainage is conveyed by a heavily vegetated swale (approximately 1.0m–1.5m depth, 4.0m-5.0m width with 3:1 slopes)

immediately north of the existing tracks. The private property drains to the swale north of the rail right-of-way. Track drainage is captured and conveyed through the local swale. Both swales outlet to Shoreacres Creek. Properties south of the rail corridor are mostly at a lower grade than the tracks. An existing 3-cell culvert (built in 1990) divides the site and conveys flows from north to south under the existing tracks (see **Figure 3-5** and **Figure 3-6**). Data from the City of Burlington contours suggest that overland drainage in this area flows north to south. Shoreacres Creek and existing storm sewer systems within the site are shown on **Figure 3-9**.

Detailed geotechnical and hydrogeological investigations will be required at detailed design stage to precisely determine the soil type. For the existing condition, based on the split land use of industrial, track and open space, the runoff coefficient, 'C' is estimated at 0.50 and 0.46 for Catchment 1 and 2 respectively. Runoff coefficients for industrial and open space were taken from the City of Burlington Std Dwg S-3d (June 1988). See **Figure 3-9** for existing catchment area details. Note the City of Burlington has developed new Stormwater Management Design Guidelines (2020) at the time of finalizing this report. Recalculation of run-off flows is required at subsequent design stages to confirm the findings of this Report.

FIGURE 3-8: PROPOSED WALKERS LINE LAYOVER SITE LIMITS AND REGULATORY BOUNDARIES

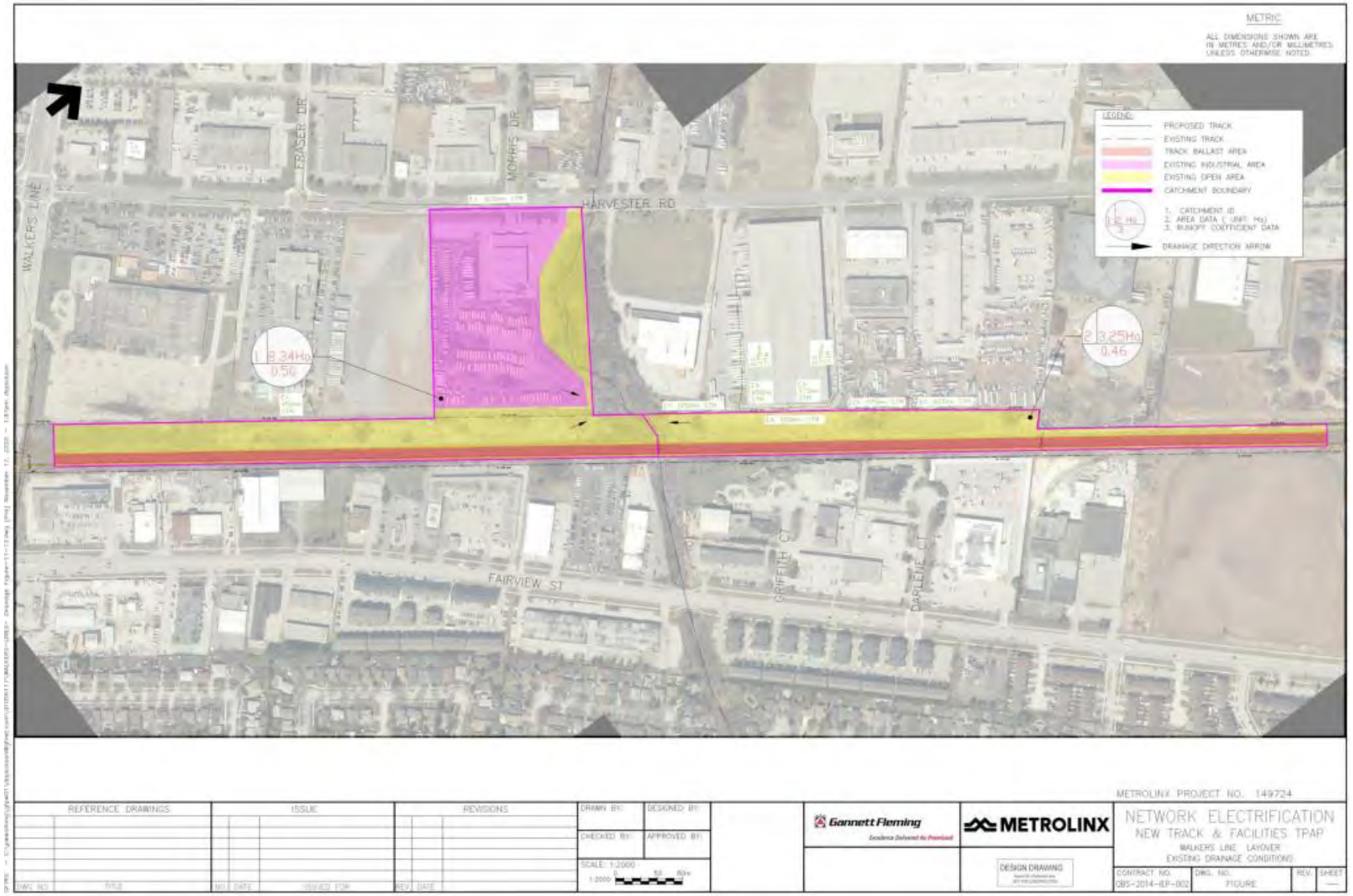

FIGURE 3-9: WALKERS LINE EXISTING DRAINAGE CONDITIONS

3.3.12 Groundwater and Wells

Please see **Appendix L** for a copy of the Hydrogeological Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.3.12.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.12.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

Source Protection Plans (SPPs) have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater wellhead protection areas (WHPA) and surface water intake protection zones (IPZ). This study area falls within the IPZ-2 intake protection zone within the Toronto Source Protection Area (SPA), which protects the City of Toronto's watershed.

The water table fluctuates seasonally by two-to-three metres; however, for the purposes of this assessment, it can be assumed that the water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. This data does not reflect groundwater patterns in deeper aquifers. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-12** below.

TABLE 3-12: SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
LSW	LSW-2	2 – 2	0.017	south

This section of the study is within the Lake Ontario Waterfront watershed. Nine watersheds drain into Lake Ontario through a major watershed, including the Lake Ontario Watershed. Pertaining to the study area, only one (1) waterbody, Etobicoke Creek, drains into the Lake Ontario Watershed and is located within 500 metres of the rail corridor.

According to the 2017 Electrification assessment along this segment of corridor, there were no water supply wells identified within 500 metres in this section of the rail corridor. This section is characterized by an urban setting, and the use of private water wells is likely negligible. As well, no wetland features exist within the study area segments of the Lakeshore West corridor.

3.3.12.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.12.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.12.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.12.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.12.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.3.12.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

SPPs have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater WHPA and surface water IPZ. The study area falls within the IPZ-2, CH intake protection zone within the Halton Region SPA. The regional physiography in this area is defined as Iroquois Plain with the surficial geology described as being predominantly composed of well drained coarse-textured glaciolacustrine deposits (Chapman and Putnam, 1984).

There are three domestic supply wells noted in the MECP Well Record Database (IDs 2800260, 2800261 and 5719966) within 500 m of the proposed Layover facility. The remaining records are for wells used for observation/monitoring/test holes (77 wells), abandoned (3 wells) or of unknown use (11 wells). The area is serviced with municipal water supply, and based on the availability of municipal services, it is likely that the domestic wells are no longer in use for water supply purposes. Use of these wells should be confirmed by the contractor prior to construction activities.

There are 2 waterbodies located within 500 m of the Study Area Segment; Shoreacres Creek and Tuck Creek. Both creeks flow in a southerly direction under the current rail line ROW towards Lake Ontario. However, only Shoreacres Creek is located within the footprint of the proposed layover facility, passing under the existing tracks through a three-cell culvert (see **Figure 3-5** and **Figure 3-6**). Preliminary design plans include extension of the culvert for the Creek by approximately 32 m.

3.4 Kitchener Rail Corridor

3.4.1 Natural Environment

A Natural Environment Assessment Report (refer to **Appendix A**) was prepared, which details the baseline condition within the additional study area.

3.4.1.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

This section of the corridor is located within Ecoregion 7E-4. The surrounding land consists primarily of commercial and institutional uses, including the Woodbine Racetrack.

3.4.1.1.1 Terrestrial

3.4.1.1.1.1 Wetlands

There are several identified unevaluated wetlands within this portion of the study area. One unevaluated wetland occurs near the western boundary of this segment of the Project study area. Larger unevaluated wetlands are also present in the Mimico Creek valley and riparian area in the vicinity of the western terminus of this section.

3.4.1.1.1.2 Vegetated Areas

The study area contains a large portion of CVC, as well as CVI. The vegetated communities within this corridor section are limited to the riparian valley areas surrounding Mimico Creek. These communities consist of CUM, MEM, and WOD. OA areas are present at Mimico Creek. The cultural communities are abundant in Southern Ontario and are derived from or maintained by recent human disturbance. A discontinuous narrow row of deciduous trees and shrubs lines the margins of the existing rail corridor through the remainder of these segments.

3.4.1.1.1.3 Wildlife

This study area has a number of small identified unevaluated wetlands, identified as MEM, as well as OA areas within Mimico Creek that may provide staging, foraging and overwintering habitat for turtles and breeding and foraging habitat for amphibians and marsh birds. The CUM communities may provide potential foraging habitat for pollinating insects. The WOD communities may provide foraging and nesting habitat for breeding birds.

3.4.1.1.2 Aquatic

The Mimico Creek valley and riparian area in vicinity of the western terminus of this section is the only waterbody feature within this section of the Project study area. Mimico Creek is an urban watercourse that has been significantly affected over time by increased development and encroachment. The Mimico Creek watershed is dominated by cool-warm water generalist species tolerant of a range of habitat conditions. In this segment of the Project study area, Mimico Creek exhibits moderate levels of channel sinuosity within its valley confines. Stream morphology follows a general riffle-pool sequence with low gradient areas that display homogeneous flat and slow run habitats.

Mimico Creek provides cool-warm water habitat for several fish common and tolerant fish species. Historical data provided by MNRF and TRCA as part of a previous GO Corridor study (GLL, 2008) suggests presence of Creek Chub, Bluntnose Minnow, Fathead Minnow, Common Shiner, White Sucker, Brook Stickleback, Blacknose Dace and Longnose Dace within Mimico Creek.

3.4.1.1.3 Species at Risk

Six species have the potential to occur within the study area: Barn Swallow, Chimney Swift, Monarch, Nine-spotted Lady Beetle, Western Chorus Frog, and Snapping Turtle.

3.4.1.1.4 Significant Wildlife Habitat

No SWH candidate or confirmed areas were identified within these segments of the project study area during previous studies completed for the 2017 GO Rail Network Electrification EPR (Natural Environment Baseline Conditions Report, Morrison Hershfield [2017]). An updated evaluation determined that candidate SWH may be present in association within Mimico Creek and its riparian corridor. If present, they would not be directly associated with this section of the Project study area (adjacent) and be considered edge habitats only, given the presence of an existing active rail corridor (see **Appendix A Figure KT-3**). Thus, these are not appropriate to map. Candidate habitats in addition to bat roosts may include: Amphibian Movement Corridors, Turtles Nesting Habitat, Shrub/Early Successional Bird Breeding Habitat and Special Concern and Rare Wildlife Species.

3.4.1.1.5 Designated Areas

This portion of the study area is located within the jurisdiction of TRCA and Aurora District MNRF. No provincially designated features are present within these segments of the project study area. The western terminus of this section is within the municipally designated City of Mississauga Urban Green lands System, Natural Heritage System - Significant Natural Areas and Natural Green Spaces, and Parks and Open Spaces - Public and Private Open Spaces.

3.4.1.2 OCS: Section KT-2 – Malton Station to Bramalea Station

This section of the corridor is located within Ecoregion 7E-4. Surrounding land uses consists primarily of commercial and industrial uses in association with a Hydro corridor and Highway 407 ETR corridor.

3.4.1.2.1 Terrestrial

3.4.1.2.1.1 Wetlands

No wetlands features are present within these segments of the project study area.

3.4.1.2.1.2 Vegetated Areas

The study area contains a large proportion of CVC, CVR, and CVI. The vegetated communities within this segment of corridor consist of MAM and sporadically occurring deciduous trees and shrubs occurring within the CUM.

3.4.1.2.1.3 Wildlife

Meadow vegetation occurring along the existing rail corridor provides marginal foraging and nesting habitat for common urban tolerant resident and migratory birds and common urban mammals.

3.4.1.2.2 Aquatic

A small tributary of Mimico Creek occurs within this section of the project study area. The Mimico Creek watershed is dominated by cool-warm water generalist species tolerant of a range of habitat conditions. This surface water feature conveys stormwater from a constructed stormwater facility positioned adjacent to the western portion of the segment and flows eastward, joining similar conveyance features along its path toward the eastern limit of these segments. Within these segments, the channel passes through the easterly terminus and under the existing rail bed. While no fisheries information has been obtained from agencies or through prior TPAP studies, proposed activities are not anticipated to affect this small tributary.

3.4.1.2.3 Species at Risk

Four species have the potential to occur within the study area: Chimney Swift, Monarch, Nine-spotted Lady Beetle, and Snapping Turtle.

3.4.1.2.4 Significant Wildlife Habitat

An updated evaluation determined that candidate SWH is extremely limited. If present, Terrestrial Crayfish habitat may occur anywhere hydric soils are present (e.g., fallow, agricultural wet areas, cultural fields and wet meadows).

3.4.1.2.5 Designated Areas

No provincially or municipally designated features are present within this section of the Project study area. A portion of this section is within the Toronto and Region Conservation Authorities (TRCA's) Regulatory Limit (Conceptual) and Aurora District MNRF.

3.4.2 Preliminary Environmental Site Assessment

A Preliminary Environmental Site Assessment (refer to **Appendix B**) was prepared for new layover facilities, which details the baseline condition within the additional study area. Details on the assessment of additional OCS infrastructure along the corridor is provided below, where applicable.

3.4.2.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

3.4.2.2 OCS: Section KT-2 – Malton Station to Bramalea Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

3.4.3 Built Heritage Resources and Cultural Heritage Landscapes

Please refer to **Appendix C1** for a description of methodology followed for identification of potential cultural heritage resources within the additional study area.

3.4.3.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

No BHRs or CHLs are located within the rail corridor or the 30 m buffer along this segment.

3.4.3.2 OCS: Section KT-2 – Malton Station to Bramalea Station

No BHRs or CHLs are located within the rail corridor or the 30 m buffer along this segment.

3.4.4 Archaeology

A review of the historic land use of the Kitchener corridor indicates that it has been occupied by Indigenous peoples for thousands of years. It is situated within the traditional territory occupied by the ancestral Huron-Wendat until the turn of the sixteenth century; subsequently utilized by the Seneca First Nation as a hunting ground until the late seventeenth century; and, subsequently occupied by the Mississauga First Nation until 1806 and 1818 (AANDC 2013a; 2013d; Ellis 2013; Williamson 2013). The background research also acknowledges that since the turn of the eighteenth century, the Métis have lived throughout the Province of Ontario but are often muted in the historical record (MNC n.d.; Stone and Chaput 1978:607,608). Since 1806, the corridor has been occupied by Euro-Canadian peoples and is situated within the former Townships of Toronto Gore and Toronto, County of Peel; and, since 1818 within the former Township of Chinguacousy, County of Peel (Pope 1877b). A review of 19th century mapping indicates that the corridor includes both historic features and transportation routes (Tremaine 1859; Pope 1877b).

A review of the physiography of the corridor indicates that it is situated within the Peel Plain physiographic region of southern Ontario (Chapman and Putnam 1984). Review of soils information indicates that the corridor does not include any well-drained sandy soils (Department of Agriculture 1953; Hoffman and Richards 1953).

Please see **Appendix D** for a copy of the Archaeological Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.4.4.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

Section KT-1 meets the following criteria which are indicative of archaeological potential:

- Proximity to Euro-Canadian settlement (Weston);
- Proximity to historic transportation routes (Goreway Drive, Highway 27, Islington Avenue, Martin Grove Road);
- Proximity to historic features (farmstead; station grounds);
- Proximity to previously registered archaeological sites (AkGv-345); and
- Proximity to water source (Humber River, Mimico Creek).

Segments within this study area are located in Borden block *AkGv*. According to the OASD (MHSTCI 2019), one previously registered archaeological site is located within one kilometre of the study area, which is not located within 50 metres. Site details are presented in **Table 3-13**.

TABLE 3-13: SECTION KT-1 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGv-345	n/a	Pre-Contact Indigenous	Unknown	ASI 2017

This segment has been subject to eight previous archaeological assessments:

- (ASI 1999) Stage 1 Archaeological Assessment of proposed Highway 409/427 Interchange, Town of Etobicoke, Metropolitan Toronto and Regional Municipality of Peel.
- (ASI 2007a) Stage 1 and Stage 2 Archaeological Assessment of the Labatt's Brewery Property, part of Lots 24 and 25, Concession B Former Township of Etobicoke, County of York Now in the City of Toronto P265-010-2007.
- (ASI 2007b) Stage 1 Archaeological Assessment of the Woodbine Entertainment Complex Former Township of Etobicoke, County of York Now in the City of Toronto P047-230-2006.
- (ASI 2007c) Stage 1 and 2 Archaeological Assessment of the Woodbine Entertainment Complex Former Township of Etobicoke, County of York now in the City of Toronto P049-245-2007.
- (ASI 2009a) Stage 1 Archaeological Assessment Georgetown South Service Expansion and Union-Pearson Rail Link P057-509-2008.
- (ASI 2011a) Stage 1 Archeological Assessment (background research and property inspection) update for GO Transit South Service Expansion and Union-Pearson Rail Link, City of Mississauga, Regional Municipality of Peel, Ontario P057662-2010.
- (ASI 2017a) Stage 1 Archaeological Assessment of the Woodbine Entertainment Complex Former Township of Etobicoke, County of York Now in the City of Toronto P047-230-2006.
- (ASI 2017b) Stage 1 Archaeological Assessment Toronto Basement Flooding Remediation & Water Quality Improvement Master Plan Area 36 Part of Lots 22-27, Concession 2, Lots 19-27, Concession 1, Lots 19-24, Concession A, Lots 19-22, Concession B, and Lots 18-22, Concession C (Former Township of Etobicoke, County of York) City of Toronto, Ontario P1066-0068-2017.

These criteria are indicative of the study area as having potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.4.4.2 OCS: Section KT-2 – Malton Station to Bramalea Station

Section KT-2 meets the following criteria which are indicative of archaeological potential:

- Proximity to Euro-Canadian settlement (Fraser's Corners, Malton);
- Proximity to historic transportation route (Bramalea Road, Grand Trunk Railway, Torbram Road, Steeles Avenue);
- Proximity to historic features (farmsteads);

- Proximity to previously registered archaeological sites (see **Table 3-14**); and
- Proximity to water source (Credit River, Etobicoke Creek).

Segments within this study area are located in Borden block *AkGv*. According to the OASD (MHSTCI 2019), there are seven previously registered archaeological sites located within one kilometre of the study area which is not located within 50 metres. Site details are presented in **Table 3-14**.

TABLE 3-14: SECTION KT-2 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGv-270	n/a	Woodland, Early	Camp/Campsite	Archeoworks 2006
AkGv-271	n/a	Woodland, Early	Camp/Campsite	Archeoworks 2006
AkGw-6	Davis	Euro-Canadian	Homestead	ASI 1981
AkGw-7	Leonard Thompson	Euro-Canadian	Homestead	MPP 1986
AkGw-8	n/a	Archaic, Late	Unknown	MPP 1986
AkGw-84	n/a	Archaic, Late	Findspot	CRMG 1994
AkGw-476	Soper Site	Euro-Canadian	Homestead	DRPA 2014; TMHC 2015; Stantec 2016

This section has been subject to four previous archaeological assessments:

- (ASI 1990) An Archaeological Resource Assessment of Proposed Industrial Subdivision 21T-86075, Part of Lot 12, Concession 6, E.H.S. City of Mississauga, Region of Peel 90-021.
- (ASI 2004) Stage 2 Archaeological Assessment Etobicoke Creek Trunk Sanitary Sewer Twinning Section S.5 City of Brampton and City of Mississauga Regional Municipality of Peel Ontario P052-029, P057-069.
- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016.
- (ASI 2017c) Stage 1 Archaeological Assessment 407 Transitway from West of Hurontario Street to East of Highway 400 Lots 12-13, Concession I West and Lots 12-15, Concession I-VI East, Former Township of Toronto; Lots 1-2, Concession V-VI East, Former Township of Chinguacousy; Lots 1, 2, and 15, Concession VII-IX East, Former Township of Toronto Gore (County of Peel); Lot 40, Concession A and I-IV, Township of Etobicoke; Lots 1-4, Concession V-IX Township of Vaughan (County of York) Cities of Vaughan, Mississauga, and Brampton Regional Municipalities of Peel, York and Toronto P128-0151-2016.

These criteria are indicative of the study area as having potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.4.5 Land Use and Socio-Economic

Please see **Appendix E** for a copy of the Land Use and Socio-Economic Addendum Report, which details the baseline conditions assessment completed for this discipline.

The portion of the Kitchener Corridor from Strachan Avenue to the airport spur (at Highway 427) was previously assessed/approved as part of the Metrolinx UP Express Electrification EA. In addition, there is a TPAP currently being completed as part of the Kitchener Corridor Expansion for the Guelph Subdivision. The segment of the Kitchener Corridor evaluated in this study extends from approximately Mile 13.52 to Mile 12.30, within the City of Mississauga, City of Brampton and Peel Region.

There are no sensitive facilities within approximately 100 metres of the Kitchener Corridor.

3.4.5.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

3.4.5.1.1 Existing Land Use

In Mississauga, lands along the rail corridor to the Malton GO Station are primarily designated as *Industrial* and *Business Employment*, with Greenlands around Paul Coffey Park/Mimico Creek. Southwest of the Malton GO Station is Toronto Pearson International Airport. Official Plan land use designations along this section of the rail corridor is shown in **Figure KT-1** in **Appendix E**.

Paul Coffey Park is the only large park that borders this section of the rail corridor, and there are no sensitive receptor facilities in the vicinity of the rail corridor.

There are no hospitals, schools, places of worship, child-care centres or long-term care centres in the vicinity of the rail corridor.

3.4.5.1.2 Planned Land Use

There are no Secondary Plans affecting the lands adjacent to this section of the rail corridor. There is a draft plan of subdivision located approximately 250 metres north of the rail corridor, which is intended to be used as an entertainment complex. At the time of the preparation of this EPR Addendum, the proposed development is currently with the Local Planning Appeal Tribunal (LPAT) for appeal.

Under the City of Mississauga Zoning By-law 0225-2007 the rail corridor does not have any zoning designation.

3.4.5.2 OCS: Section KT-2 – Malton Station to Bramalea Station

3.4.5.2.1 Existing Land Use

West of the Malton GO Station to Hull Street/Beverley Street, land use adjacent to the rail corridor is characterized by *Low Density Residential*, *Greenbelt*, *Mainstreet Retail Commercial*, and *General Retail Commercial*. The remainder of adjacent land use is *Business Employment* and *Industrial* to the municipal border.

Entering Brampton, land use along the rail corridor is entirely *Parkway Belt West, Open Space, Industrial and Office*, with *Business Corridor* around the Bramalea GO Station. Undeveloped lands are located between the municipal border and Highway 407, and west of Highway 407 to Bramalea Road. Official Plan land use designations along this section of the rail corridor are shown in **Figures KT-4 to KT-5 in Appendix E**.

There are no hospitals, schools, places of worship, child-care centres or long-term care centres in the vicinity of the rail corridor.

3.4.5.2.2 Planned Land Use

All lands located within the City of Brampton are classified under Secondary Plans. The rail corridor passes through the Steeles Industrial Secondary Plan and runs adjacent to the Bramalea Road South Gateway Secondary Plan. The goals of the Steeles Industrial Secondary Plan policy guidelines are to promote the industrial, commercial and institutional development of the affected lands. The Bramalea Road South Gateway Secondary Plan envisions the area as a mixed-use centre that will function as an urban gateway into the City of Brampton. The undeveloped areas around the 407 are designated as Parkway Belt West.

The City of Brampton is currently undertaking an environmental assessment to widen Bramalea Road between the city limits and Steeles Avenue East. This includes a widening of the bridge on Bramalea Road which crosses the rail tracks. There are no planned and approved recreational amenities bordering this section of the rail corridor, and the rail corridor is zoned Public Ownership and Utilities under the City of Brampton Zoning By-law 270-2004.

3.4.6 Air Quality

Since 2017, Metrolinx has made significant changes to the planned rail infrastructure and train service for the GO Expansion Program, of which Electrification forms a part. The potential air quality impacts of trains and associated equipment and infrastructure have been assessed at both the regional scale, and locally in those segments of the corridors which are expected to experience an increase in diesel (i.e. non-electrified) powered equipment activity relative to the 2015 (pre-project or baseline) levels and which have sensitive receptors exposed to the rail corridor. While diesel service levels will remain the same or decrease (with electric train service taking up the planned increased service levels), there will be an increase in the number of diesel locomotives operating on some corridors. This is due to the need to power diesel trains with two locomotives rather than one during peak periods.

The air quality baseline conditions within the additional study area for this discipline are detailed in **Appendix F3**.

The local air quality study focused on sections of the Kitchener Corridor (west of the UP Express Pearson International Airport Spur) where sensitive receptors are located close enough to the tracks to potentially experience air contaminant levels that are significantly above background levels. Sections of the corridor that had significant numbers of residences and other sensitive receptors within 150m of the tracks were modelled, and sections that were dominated by industrial or commercial uses within 150m of the tracks were not modelled.

The study area segment begins east of Malton GO station, at Airport Road, and continues approximately 800 m to the west. The area studied along this segment extended to a distance of 300 m away from the tracks. The Kitchener Corridor study area is shown in **Figure 3-10**.

There are no GO Train stations within the modelled study area.

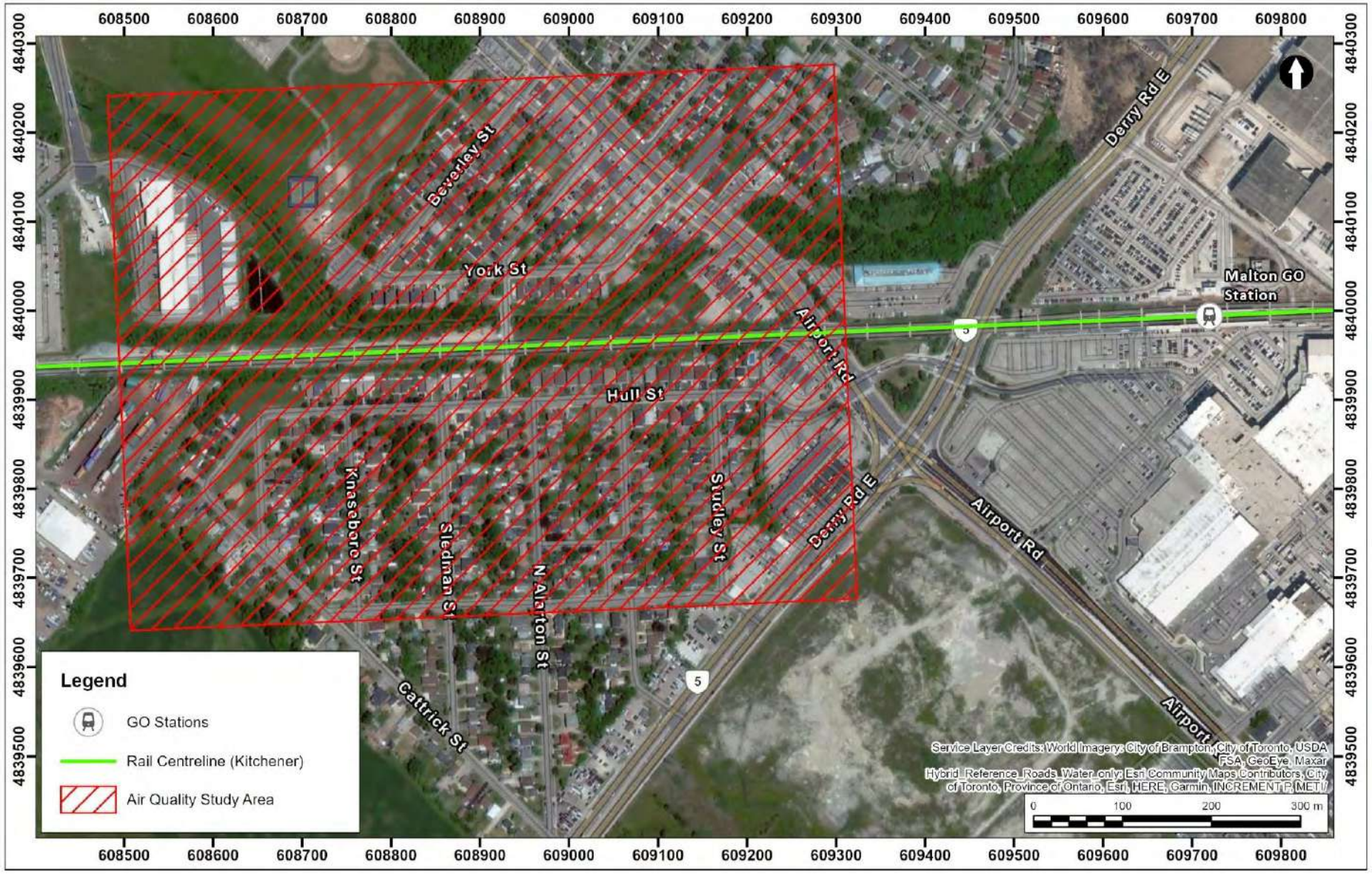

FIGURE 3-10: KITCHENER AIR QUALITY STUDY AREA

Baseline service levels are based on the maximum levels in 2015. Service levels within the Kitchener Corridor study area are as follows:

- 30 revenue GO diesel trains per day, each powered by 1 locomotive;
- 4 non-revenue GO diesel trains per day, each powered by 1 locomotive; and
- 2 CN Freight diesel trains per day.

For the future scenario, the future rail schedule service levels account for operational and safety considerations and regulations that limit the service levels achievable with a given infrastructure design. Current rail regulations are principally governed by Transport Canada and the US Federal Rail Administration. Rail policy has also been developed by the American Railway Engineering and Maintenance of Way Association (AREMA) and the American Public Transportation Association (APTA). Metrolinx, Canadian National (CN) and Canadian Pacific (CP) Railway have also established additional operational policies, standards, and rules to ensure safe and reliable service.

Collectively, these regulations and policies dictate how railways are designed, operated and maintained. To expand rail service, the regulations and policies have to be considered. If the existing infrastructure does not allow expanded service, then new infrastructure must be considered. Service goals represent long term planning upon which infrastructure plans are developed.

In the future scenario, the train fleet travelling on the Kitchener Corridor will be both electric and diesel. The future service levels of diesel trains travelling on the Kitchener Corridor are as follows:

- 72 GO diesel revenue trains per day, each powered by 2 locomotives;
- 92 GO diesel revenue trains per day, each powered by 1 locomotive;
- 0 GO diesel non-revenue trains per day;
- 4 VIA trains per day; and
- 4 CN Freight diesel trains per day.

Note that the future rail schedule includes a 10% mark-up of actual projected diesel service levels, to help ensure that the air quality assessment is conservative. The future scenario used for modelling is a 'worst-case' service concept only developed for this project, which assumes full diesel service (despite the intention to implement electric train service on this corridor). The Project consortium will be responsible for developing the service concept to meet contractual service level requirements.

Table 3-15 and **Table 3-16** present background concentrations for all contaminants and relevant averaging times. The 90th percentile 24-hour concentrations for NO_2 and $PM_{2.5}$ were determined using data from the Toronto Downtown monitoring station for the years 2013 to 2017.

TABLE 3-15: SUMMARY OF BACKGROUND CONCENTRATION LEVELS IN STUDY AREA

Contaminant	Averaging Time	Background concentrations (µg/m^3)
CO	1 hour	219
	8 hours [2]	1189
NO_2	Annual	28
$PM_{2.5}$	Annual	8.0
PM_{10} [1]	24 hours	26
Benzene	24 hours	0.80
	Annual	0.52
Benzo(a)pyrene	24 hours	9.5E-05

Contaminant	Averaging Time	Background concentrations (µg/m^3)
	Annual	5.5E-05
1,3-Butadiene	24 hours	0.07
	Annual	0.04
Formaldehyde	24 hours	3.5
Acetaldehyde	24 hours	1.7
Acrolein	1 hour [3]	0.12
	24 hours	0.07

[1] Ambient Background Level estimated from $PM_{2.5}$ levels using published emission factors (Lall et al., 2004)
[2] 90th percentile 8-hour ambient CO data was not available; the maximum 8-hour concentration from NAPS Station 60430 –Toronto West and NAPS Station 60440 - Toronto North was used
[3] 1-hr average ambient acrolein data was not available; the maximum 24-hr concentration from NAPS Station 62601- Experimental Farm, Simcoe, ON was used.

TABLE 3-16: 90TH PERCENTILE BACKGROUND NO_2 AND $PM_{2.5}$ CONCENTRATIONS BY HOUR OF DAY

Hour of Day	NO_2 (ppb)	$PM_{2.5}$ (µg/m^3)
1	26	16
2	26	16
3	26	16
4	26	16
5	26	16
6	27	17
7	30	16
8	32	16
9	31	16
10	27	16
11	23	16
12	20	16
13	19	15
14	18	14
15	18	14
16	18	14
17	19	14
18	20	15
19	21	15
20	23	15
21	24	16
22	25	15
23	26	15
24	26	15

A comparison of background concentrations to the applicable AAQC's and CAAQS shows that the background concentrations generally meet the air quality objects, with the exception of benzo(a)pyrene and

annual average benzene concentrations. This situation with the latter two air contaminants is not unique to the study area, but is widespread across Southern Ontario.

3.4.7 Noise and Vibration

The noise and vibration baseline conditions within the additional study area for this discipline are detailed in **Appendix G3**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.3.

The KT Corridor Study Area begins at UP Express Pearson International Airport Spur and ends at the Bramalea GO station, approximately 7 kilometres in length. The Study Area is shown in **Figure 3-10**.

Receptors for this assessment include the following sensitive land uses:

- Residences;
- Hotels, motels and campgrounds;
- Schools, universities, libraries and daycare centres;
- Hospitals and clinics, nursing / retirement homes;
- Churches and places of worship;
- Planned residential developments with approved building permits from the Municipality; and
- Vacant lots that are currently zoned for residential use.

Noise receptors within the Study Area are mainly residential houses located adjacent to the KT Rail Corridor. In general, areas of receptors were identified using publicly available address point databases or through visual identification using publicly available satellite aerial images.

In the 2017 EPR, vacant lots were only assessed for residential developments with approved building permits. In this addendum, all vacant lots that are zoned for residential use (with or without building permits) were included in the assessment. All vacant residential lots within the Study Area were considered.

Representative noise receptors were chosen to simplify the presentation of results for a much larger number of receptors assessed. The representative noise receptors are summarized in **Table 3-17**. Complete mapping of noise receptors is included in **Appendix G.**

For the assessment of vibration, the proximity of all noise receptors within the KT Corridor to changes in track alignment or special trackwork was assessed. The following areas were identified as areas of investigation for operational vibration:

- An additional 700 m of new track just east of Highway 407;
- 15 new switches along the Corridor.

Receptors for vibration include the same sensitive land uses as described in the noise assessment. However, future development locations that did not have approval for residential uses were not included since they would need to be designed to achieve appropriate vibration levels with the future rail infrastructure in place. The point of evaluation is defined as 5 to 10 m from the building foundation in a direction parallel to the tracks.

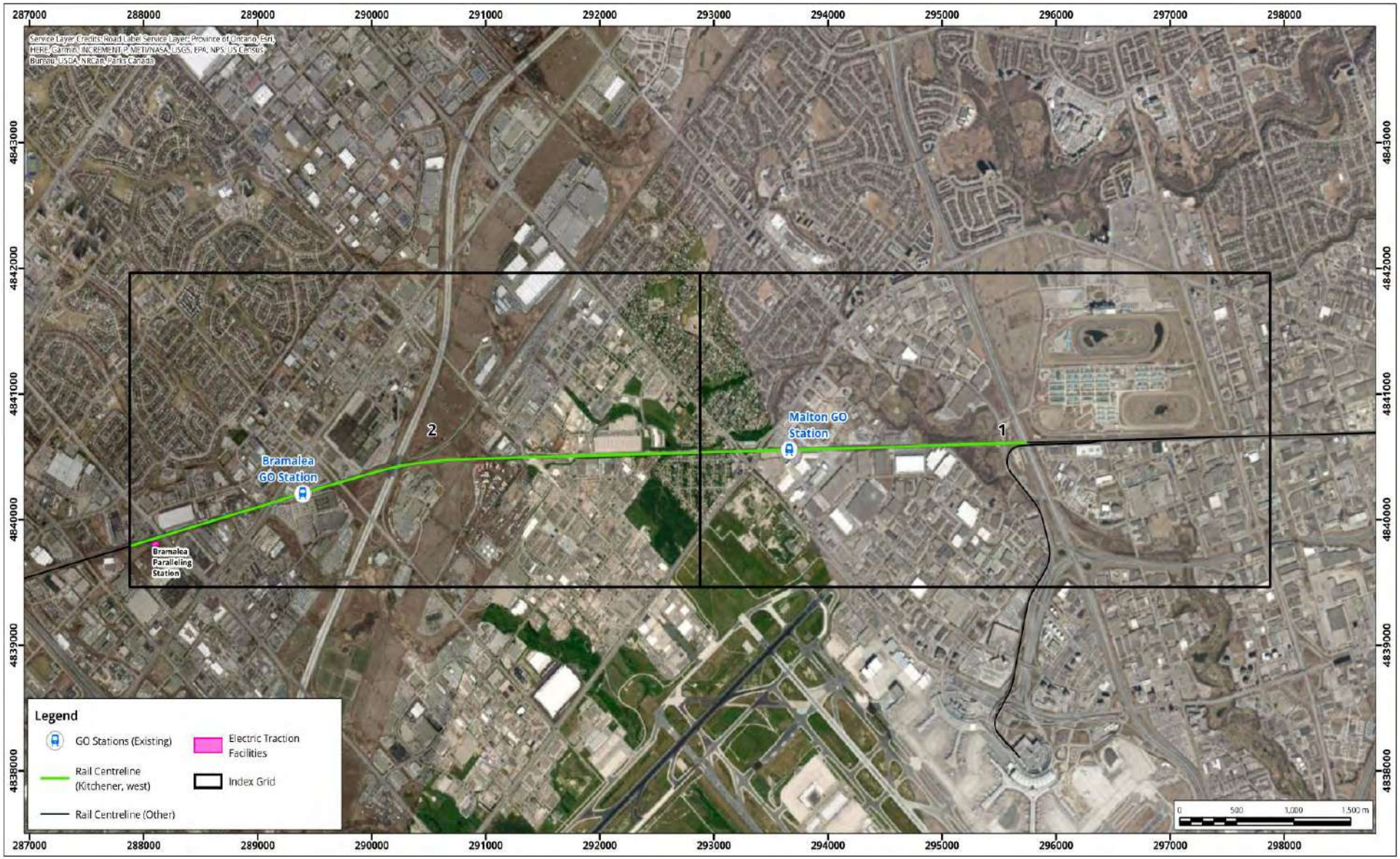

FIGURE 3-11: KITCHENER NOISE & VIBRATION STUDY AREA

TABLE 3-17: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS (MALTON GO TO WEST OF BRAMALEA GO)

Track Section	Receptor ID[1]	Figure[41]	Description	Receptor Distance from Nearest Track (m)
Malton GO to Bramalea GO	R01	D.1.1	Single Detached Dwelling	180
	R02	D.1.1	Single Detached Dwelling	30
	R03	D.1.1	Single Detached Dwelling	50
	R04	D.1.1	Single Detached Dwelling	30
	R05	D.1.1	Single Detached Dwelling	60
West of Bramalea GO	R06	D.1.2	Single Detached Dwelling	440 [2]

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

[2] Receptor R06 represents the worst-case receptor location for the Bramalea PS, which is west of the Bramalea Station. The distance presented represents the distance to the Bramalea PS, as the receptor is more than 1 km from the closest trackwork.

Existing noise barriers are defined as barriers built as of August 2019 or planned barriers identified during Environmental Assessments completed prior to August 2019. There were no existing barriers in the study area.

3.4.8 Visual

Please see **Appendix H** for a copy of the Visual Assessment Report, which details the baseline conditions assessment completed for this discipline. A detailed description of the methodology used to classify areas of potential visual impact can be found in **Section 3.3.8.**

The Kitchener Corridor passes through the City of Mississauga and the City of Brampton. In Mississauga, lands along the rail corridor to the Malton GO Station are primarily designated as *Industrial* and *Business Employment*, with *Greenlands* around Paul Coffey Park (formerly Wildwood Park) and Mimico Creek. Southwest of the Malton GO Station is Toronto Pearson International Airport. West of the Malton GO Station to Hull Street/Beverley Street, land use adjacent to the rail corridor is characterized by *Low Density Residential*, *Greenbelt*, *Mainstreet Retail Commercial*, and *General Retail Commercial*. The remainder of adjacent land use is *Business Employment* and *Industrial* to the municipal border. Entering Brampton, land use along the rail corridor is entirely *Parkway Belt West*, *Open Space*, *Industrial* and *Office*, with *Business Corridor* around the Bramalea GO Station. Undeveloped lands are located between the municipal border and Highway 407, and west of Highway 407 to Bramalea Road.

3.4.8.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

This section is located in Mississauga, traversing a primarily *Employment* and *Industrial* zone. The proposed tracks extend over Highway 427. There are two existing rail overpasses, one over Goreway Drive and one over a small creek that runs through Paul Coffey Park to the west. These rail structures are located in undeveloped, natural areas (see **Figure 3-12**). The proposed track upgrades are proposed to occur within the existing Metrolinx rail ROW, resulting in no vertical profile disturbance to the existing track bed. For these reasons, the visual baseline conditions are classified as *Negligible*.

[41] Figures referenced are included in **Appendix G3.**

FIGURE 3-12: AERIAL VIEW OF PROPOSED INFRASTRUCTURE NEAR GOREWAY DRIVE (LOOKING NORTHWEST)[42]

3.4.8.2 OCS: Section KT-2 – Malton Station to Bramalea Station

This section is located within the City of Brampton and consists primarily of *Industrial* properties with one small park/open space area on both sides of the rail corridor. On the north side of the rail right-of-way, a small waterway or ditch with wooded banks affords visual protection for the surrounding areas.

The proposed track upgrades lead to Bramalea GO Station, passing under Highway 407 and Bramalea Road. Bramalea GO Station has a large parking lot that abuts the rail corridor to the north. Passengers arriving at and departing from the station are not expected to experience different views as the track upgrades are proposed to occur within the existing GO Rail right-of-way (see **Figure 3-13**), resulting in the existing visual baseline conditions to be classified as *Negligible*.

[42] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange; Metrolinx-owned property is depicted in red.

FIGURE 3-13: AERIAL VIEW OF PROPOSED INFRASTRUCTURE NEAR BRAMALEA GO STATION (LOOKING WEST)[43]

3.4.9 Utilities

Please see **Appendix I** for a copy of the Utilities Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.4.9.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

3.4.9.2 OCS: Section KT-2 – Malton Station to Bramalea Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

3.4.10 EMI & EMF

Please see **Appendix J** for a copy of the EMI & EMF Assessment Report, which details the baseline conditions assessment completed for this discipline.

[43] Previously approved electrification infrastructure, including Tap/TPF sites and feeder routes (as applicable) are not depicted

3.4.10.1 EMI Sensitive Sites

Based on the baseline mapping for the Kitchener Corridor, no EMI sensitive sites were identified within Zone 3 or closer (i.e., less than 100 metres from the closest track) or between 100 metres and 250 metres (the conservative evaluation zone) from the corridor.

3.4.10.2 ELF EMF Measurements

The tables in Section 4.2.4.2 to Section 4.2.4.3 in the 2017 Electrification EMI/EMF Baseline Conditions Report (Appendix J1 of 2017 EPR) present the ELF EMF measurements at select points along the Kitchener Corridor. There were two high-ELF (> 10 mG) areas along this corridor, as shown in **Table 3-18**.

Figure 3-14 shows aerial views of these locations in relation to the study area. These are locations where post-electrification measurement of ELF EMF is recommended.

TABLE 3-18: SUMMARY OF HIGH ELF (>10MG) AREAS ALONG THE KITCHENER CORRIDOR

Area of Interest	Coordinates	Resultant Flux Density Magnitude (mG)	References
Under High Voltage Lines	43°42'14.5"N, 79°40'28.9"W	54.2	**Figure 3-14**
3 metres from center of track	43°42'14.5"N, 79°40"25.6"W	55.2	**Figure 3-14**

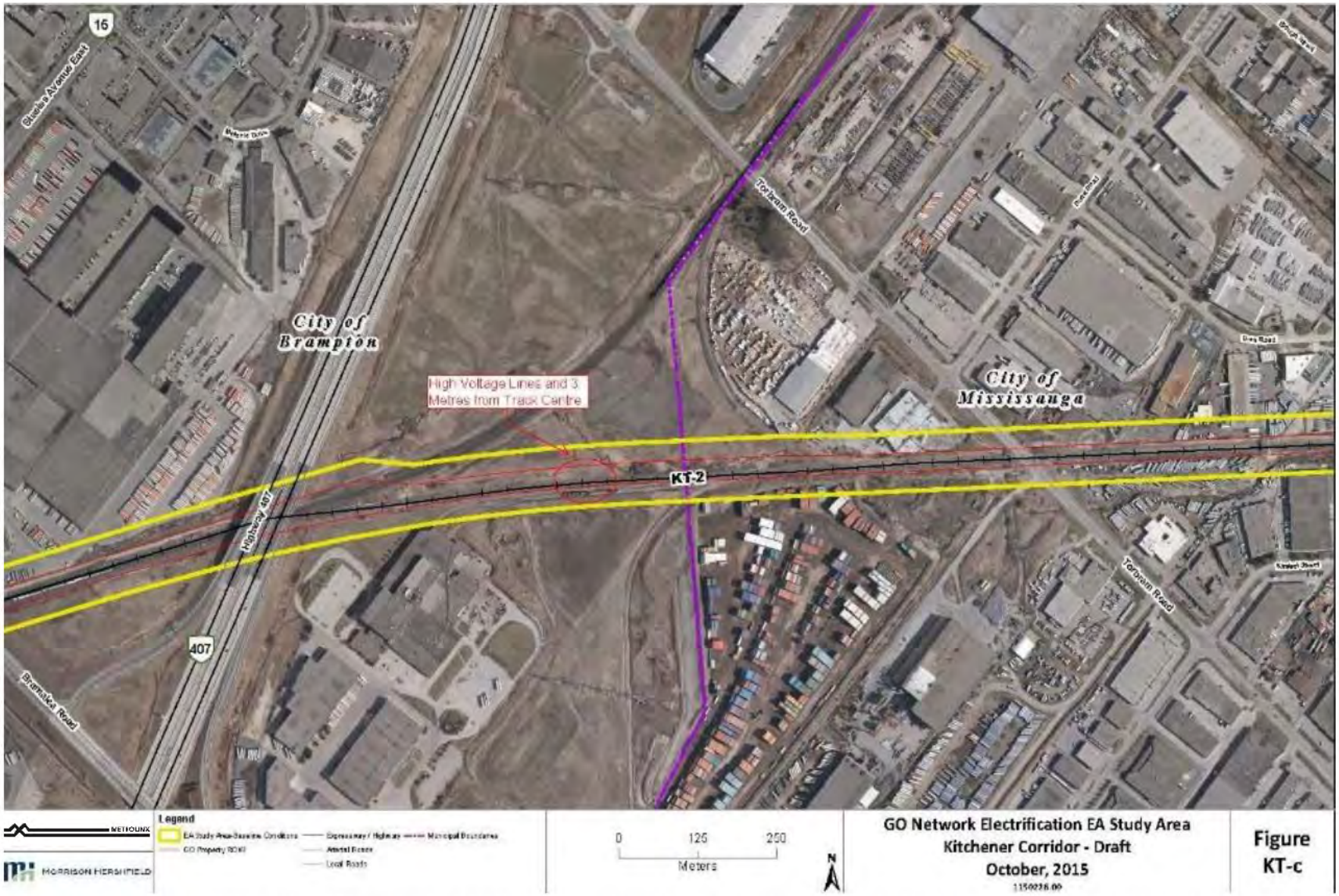

FIGURE 3-14: ELF SITES IN KITCHENER CORRIDOR – UNDER HIGH VOLTAGE LINES AND 3 METRES FROM CENTER OF TRACK IN RELATION TO STUDY AREA

3.4.11 Stormwater Management

Please see **Appendix K** for a copy of the Preliminary Stormwater Management Report, which details the baseline conditions assessment completed for this discipline.

3.4.11.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

3.4.11.2 OCS: Section KT-2 – Malton Station to Bramalea Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

3.4.12 Groundwater and Wells

Please see **Appendix L** for a copy of the Hydrogeological Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.4.12.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

This segment is located within the Toronto SPA. With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. This data does not reflect ground water patterns in deeper aquifers. Nearby waterbodies and water courses may also have an influence on the observed gradients in the case KT-1 (Humber River) due to surface water level fluctuations. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-19** below.

TABLE 3-19: SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
KT	KT-1 to KT-2	2-12	0.068	east

This section of the study is within the network of the Mimico Creek Sub-Watershed. Water within the Mimico Creek Sub-watershed originates from the south slopes of the Oak Ridges Moraine (ORM) and flows to Lake Ontario. Mimico Creek is the primary water body within the watershed, with mean stream flows of about 25 Mm^3/yr (TRCA, 2010). However, unlike other watersheds in the area, the Mimico Creek Watershed is not highly supported by baseflow from the ORM, due primarily to the low permeability glacial till soils it crosses.

The TRCA has indicated that "*a general conclusion regarding water quality in the Etobicoke and Mimico Creeks watersheds is that water quality issues are correlated to the amount of urbanization within a watershed*" (TRCA, 2010). Surface water quality has remained consistent over the past few years, with metals and conventional parameter concentrations generally meeting guideline targets. As with most watersheds, chloride is the exception with a trend of increasing concentrations.

According to the 2017 Electrification assessment along this segment of corridor, there were no water supply wells identified within 500 metres of this section of the rail corridor. The section is characterized by an urban setting and the use of private water wells in this area is likely negligible.

The main branch of Mimico Creek is located within this study area and has an east-southeast flow direction with permanent flow. Mimico Creek and the tributary are CRA fisheries, providing warmwater habitat.

3.4.12.2 OCS: Section KT-2 – Malton Station to Bramalea Station

This segment is located within the Toronto SPA. With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. This data does not reflect ground water patterns in deeper aquifers. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-20** below.

TABLE 3-20: SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
KT	KT-1 to KT-2	2-12	0.068	east

This section of the study is within the network of the Mimico Creek Sub-Watershed. Water within the Mimico Creek Sub-watershed originates from the south slopes of the Oak Ridges Moraine (ORM) and flows to Lake Ontario. Mimico Creek is the primary water body within the watershed, with mean stream flows of about 25 Mm^3/yr (TRCA, 2010). However, unlike other watersheds in the area, the Mimico Creek Watershed is not highly supported by baseflow from the ORM, due primarily to the low permeability glacial till soils it crosses.

The TRCA has indicated that "*a general conclusion regarding water quality in the Etobicoke and Mimico Creeks watersheds is that water quality issues are correlated to the amount of urbanization within a watershed*" (TRCA, 2010). Surface water quality has remained consistent over the past few years, with metals and conventional parameter concentrations generally meeting guideline targets. As with most watersheds, chloride is the exception with a trend of increasing concentrations.

The main branch of Mimico Creek is located within this study area and has an east-southeast flow direction with permanent flow. Mimico Creek and the tributary are CRA fisheries, providing warmwater habitat.

3.5 Barrie Rail Corridor

3.5.1 Natural Environment

A Natural Environment Assessment Report (refer to **Appendix A**) was prepared, which details the baseline condition within the additional study area.

3.5.1.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.1.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.1.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

3.5.1.3.1 Terrestrial

This section of the corridor is located with Ecoregion 7E-4. Surrounding land use consists primarily of commercial and institutional uses.

3.5.1.3.1.1 Wetlands

No wetlands features are present within this segment of the Project study area.

3.5.1.3.1.2 Vegetated Areas

The study area contains a large proportion of CVI, CVC and CVR. The vegetated communities within this corridor section are CGL, WOD, and CUM.

3.5.1.3.1.3 Wildlife

The CUM communities may provide potential foraging habitat for pollinating insects. The WOD and GLC communities may provide foraging and nesting habitat for breeding birds.

Hatch Ltd. (2017) performed targeted wildlife surveys for amphibians and breeding birds in June 2015. No amphibians were heard during any of the three rounds of surveying. The cultural woodland community along the existing rail corridor provides foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals.

No evidence of bat candidate maternity colonies or MNRF Area Sensitive bird species were identified.

3.5.1.3.2 Aquatic

No aquatic features are present within this segment of the Project study area.

3.5.1.3.3 Species at Risk

Four species have the potential to occur within the study area: Chimney Swift, Monarch, Nine-spotted Lady Beetle and Rusty-patched Bumblebee.

3.5.1.3.4 Significant Wildlife Habitat

No SWH candidate or confirmed areas were identified within this section of the Project study are during previous studies (Hatch Ltd., 2017). An updated evaluation determined that candidate habitat is not expected within this section of the Project study area.

3.5.1.3.5 Designated Areas

This portion of the study area is located within the jurisdiction of TRCA and MNRF Aurora District. No provincially or municipally designated features are present within this section of the Project study area.

3.5.1.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.1.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.1.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

3.5.1.6.1 Terrestrial

This section of the corridor is located within Ecoregion 6E-6. Surrounding land use is comprised of residential, recreational, open space, commercial and institutional uses.

3.5.1.6.1.1 Wetlands

Both Provincially Significant and unevaluated wetlands occur within this section of the Project study area. The Mackenzie Marsh Wetland Complex is positioned in the mid-central portion of this section of the Project study area. Several other wetland communities occur northward from this PSW, including swamp (SW), shallow marsh (MAS), and meadow marsh (MAM), which are often associated with the riparian areas of the East Holland River tributaries.

3.5.1.6.1.2 Vegetated Areas

The study area contain a large proportion of CVI, CVC, and CVR. The vegetated communities within this corridor section are FOM, MA, SWM, WOM, THD, WOD, and CUM. Deciduous trees and shrubs line the margins of the existing rail corridor through much of this section of the Project study area. North of St. John's Sideroad, many of these trees and shrubs are associated with larger natural features such as the Mackenzie Marsh Wetland Complex, riparian areas of Tannery Creek, the East Holland River and its smaller tributaries, Wesley Brooks and Mabel Davis Conservation Areas.

3.5.1.6.1.3 Wildlife

Hatch Ltd. (2017) performed targeted wildlife surveys for amphibians and breeding birds throughout this section of the Project study area in June 2015. Wood Frog, Green Tree Frog, and Green Frog were heard adjacent to the Mackenzie Marsh Wetland Complex. No frogs were recorded at the other 14 sampling stations throughout these segments of the Project study area. The breeding bird survey recorded American Redstart, Barn Swallow, and Savannah Sparrow in habitats suitable for these species.

The deciduous trees and shrubs along the existing rail corridor together with the variety of cultural vegetation communities, mature woodlands and riparian corridors provide foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals.

3.5.1.6.2 Aquatic

There are no watercourses within the study area.

3.5.1.6.3 Species at Risk

Four species have the potential to occur within the study area: Butternuts, Monarch, Nine-spotted Lady Beetle and Rusty-patched Bumblebee,

3.5.1.6.4 Significant Wildlife Habitat

Several SWH candidate areas were identified within this section of the Project study area during previous studies (Hatch Ltd., 2017). An updated evaluation refined these SWH habitats to the current Project study area.

The candidate SWH identified are associated with the Conservation Areas of Shepard's Bush, Aurora McKenzie Marsh Wetland Complex, Wesley Brook and Mable Davis including riparian areas of the East Branch of the Holland River. It is important to note that all candidate areas identified are directly associated with these features due to the proximity of their boundary limits to the Project study area, thus are "edges only". In addition to bat roosts, candidate SWH include: Reptile Hibernaculum; Seeps and Springs; Terrestrial Crayfish; Amphibian Movement Corridors; Raptor Wintering Area (i.e., used for feeding and/or roosting); Turtle Wintering Areas; Provincially Rare S1, S2 and S3 vegetation communities; Waterfowl Nesting Area; 6E Raptor Nesting - Woodland Habitat 7E Raptor Nesting - Woodland Habitat; Turtles Nesting Habitat; Amphibian Breeding Habitat (Woodland); Woodland Area-Sensitive Bird Breeding Habitat; Marsh Bird Breeding Habitat; Open Country Bird Breeding Habitat; Shrub/Early Successional Bird Breeding Habitat and Special Concern and Rare Wildlife Species.

3.5.1.6.5 Designated Areas

This portion of the study area is located within the jurisdiction of Lake Simcoe Region Conservation Authority (LSRCA) and MNRF Aurora District. Sheppard's Bush Conservation Area, managed by LSRCA, is located east of the rail corridor south of Wellington Street East.

3.5.1.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

3.5.1.7.1 Terrestrial

This section of the corridor is located within Ecoregion 6E-6.

3.5.1.7.1.1 Wetlands

Both Provincially Significant and unevaluated wetlands occur within this section of the Project study area. The Mackenzie Marsh Wetland Complex is positioned in the mid-central portion of this section of the Project study area. Several other wetland communities occur northward from this PSW, including swamp (SW), shallow marsh (MAS), and meadow marsh (MAM), which are often associated with the riparian areas of the East Holland River tributaries.

3.5.1.7.1.2 Vegetated Areas

The study area contain a large proportion of CVI, CVC, and CVR. The vegetated communities within this study area include CGL, WOD, SW, MAS, MA, AG, FOD, and CUM. OA is present at the Holland East Branch.

Deciduous trees and shrubs line the margins of the existing rail corridor through much of this section of the Project study area. North of St. John's Sideroad, many of these trees and shrubs are associated with larger natural features such as the Mackenzie Marsh Wetland Complex, riparian areas of Tannery Creek, the East Holland River and its smaller tributaries, and deciduous forests (FOD) of the Wesley Brooks and Mabel Davis Conservation Areas.

3.5.1.7.1.3 Wildlife

The SW and MAS communities within the Aurora (McKenzie) Marsh Wetland Complex PSW, and a number of small unevaluated wetlands as well as the OA areas within the Holland River East Branch may potentially provide staging, foraging and overwintering habitat for turtles and breeding and foraging habitat for amphibians and marsh birds. The CUM and AG communities may provide potential habitat for grassland birds and pollinating insects. The WOD, FOD, SW and CGL communities may also provide foraging and nesting habitat for breeding birds.

Hatch Ltd. (2017) performed targeted wildlife surveys for amphibians and breeding birds throughout this section of the Project study area in June 2015. Wood Frog, Green Tree Frog, and Green Frog were heard adjacent to the Mackenzie Marsh Wetland Complex. No frogs were recorded at the other 14 sampling stations throughout these segments of the Project study area. The breeding bird survey recorded American Redstart, Barn Swallow, and Savannah Sparrow in habitats suitable for these species.

The deciduous trees and shrubs along the existing rail corridor together with the variety of cultural vegetation communities, mature woodlands and riparian corridors provide foraging and nesting/shelter habitat for resident and migratory birds and common urban mammals.

3.5.1.7.2 Aquatic

There are five watercourse crossings within the corridor segment including the Holland River East Branch and the following tributaries: Tannery Creek, Clubinis Creek, Wesley Creek and Western Creek. The fish communities in the East Holland range from cold headwater communities to diverse warm large order systems. Generally, the East Holland River displays cold to coolwater tributaries feedings a warmwater Main Branch.

3.5.1.7.3 Species at Risk

Thirteen species have the potential to occur within the study area: Barn Swallows, Bobolink, Butternuts, Eastern Meadowlark, Eastern Ribbonsnake, Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, Monarch, Nine-spotted Lady Beetle, Red-headed Woodpecker and Rusty-patched Bumblebee.

3.5.1.7.4 Significant Wildlife Habitat

Several SWH candidate areas were identified within this section of the Project study area during previous studies (Hatch Ltd., 2017). An updated evaluation refined these SWH habitats to the current Project study area. The candidate SWH identified are associated with the Conservation Areas of Shepard's Bush, Aurora

McKenzie Marsh Wetland Complex, Wesley Brook and Mable Davis including riparian areas of the East Branch of the Holland River. It is important to note that all candidate areas identified are directly associated with these features due to the proximity of their boundary limits to the Project study area, thus are “edges only”. In addition to bat roosts, candidate SWH include: Reptile Hibernaculum; Seeps and Springs; Terrestrial Crayfish; Amphibian Movement Corridors; Raptor Wintering Area (i.e., used for feeding and/or roosting); Turtle Wintering Areas; Provincially Rare S1, S2 and S3 vegetation communities; Waterfowl Nesting Area; 6E Raptor Nesting - Woodland Habitat 7E Raptor Nesting - Woodland Habitat; Turtles Nesting Habitat; Amphibian Breeding Habitat (Woodland); Woodland Area-Sensitive Bird Breeding Habitat; Marsh Bird Breeding Habitat; Open Country Bird Breeding Habitat; Shrub/Early Successional Bird Breeding Habitat and Special Concern and Rare Wildlife Species.

3.5.1.7.5 Designated Areas

This portion of the study area is located within the jurisdiction of LSRCA and Aurora District MNRF.

Mabel Davis Conservation Area, managed by LSRCA, is located east of the rail corridor between Davis Drive and Green Lane. Wesley Brooks Conservation Area, also managed by LSRCA, is located west of the corridor between Mulock Drive and Doug Duncan Drive. Bailey Ecological Park, owned by LSRCA, is located west of the corridor between Kensit Avenue and Mulock Drive.

The Aurora (McKenzie) Marsh Wetland Complex is a 10 ha area that has been designated by a PSW by the Ministry of Natural Resources and Forestry. It is recognized as a significant ecological feature due to its wildlife habitat and aesthetic value to the community. It provides habitat to turtles, frogs, small mammals and waterfowl (R.V. Anderson Ass. Ltd, 2006). According to the *Bradford Corridor Planning Study* (Delcan, 2002), McKenzie Marsh PSW is made of two individual wetland types (25% swamp, 75% marsh).

Additionally, this portion of the study area is located within the Lake Simcoe Protection Plan watershed boundaries.

3.5.1.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.1.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.1.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.1.11 OCS: Section BR-11 – 6 h Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.1.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

3.5.1.12.1 Terrestrial

This section of the corridor is located within Ecoregion 6E-6. Surrounding land use is comprised of low and medium rise residential, commercial and recreational waterfront uses.

3.5.1.12.1.1 Wetlands

No Provincially Significant Wetlands occur within this section of the Project study area. One unevaluated shallow marsh (MAS) wetland occurs adjacent to the corridor in the midsection of the section. This feature appears to be a constructed stormwater management facility.

3.5.1.12.1.2 Vegetated Areas

This portion of the study area largely consists of CVI, CVC, and CVR. The vegetated communities within this corridor section are CGL, WOD, FOM, TAG, AG, and CUM.

3.5.1.12.1.3 Wildlife

Hatch Ltd. (2017) performed targeted wildlife surveys for amphibians and breeding birds throughout this section of the Project study area in June 2015. No amphibians were recorded within this section of the Project study area. The CUM and AG communities may provide potential habitat for grassland birds and pollinating insects. The WOD and CGL communities may provide foraging and nesting habitat for breeding birds.

3.5.1.12.2 Aquatic

There is one watercourse within the study area: Whiskey Creek. Whiskey Creek is a permanent watercourse and is crossed by the existing rail corridor near the northern most extent of the section. Morphology is a shallow riffle upstream before flowing subterranean for approximately 60 metres through the Project study area.

Whiskey Creek is within the Barrie Creeks subwatershed. Whiskey Creek is an important coldwater contributor and migratory route to Lake Simcoe. Resident fish species identified in background sources by Hatch (2017) include Brook Trout, Mottled Sculpin, common dace species, White Sucker, Yellow Perch, and Black Crappie. Hatch (2017) observed a permanent concrete barrier to fish movement in the upstream section beyond the rail corridor, restricting fish access to upstream habitat year-round.

3.5.1.12.3 Species at Risk

Six species have the potential to occur within the study area: Butternuts, Little Brown Myotis, Northern Myotis, Monarch, Nine-spotted Lady Beetle, and Red-headed Woodpecker.

3.5.1.12.4 Significant Wildlife Habitat

SWH candidate areas were identified within this section of the Project study area during previous studies (Hatch Ltd., 2017). An updated evaluation determined that candidate SWH are extremely limited. There are no Candidate habitats in addition to potential bat roosts.

3.5.1.12.5 Designated Areas

This portion of the study area is located within the jurisdiction of LSRCA and Midhurst District MNRF and within the Lake Simcoe Protection Plan watershed boundaries.

3.5.2 Preliminary Environmental Site Assessment

A Preliminary Environmental Site Assessment (refer to **Appendix B**) was prepared for new layover facilities, which details the baseline condition within the additional study area. Details on the assessment of additional OCS infrastructure along the corridor is provided below, where applicable.

3.5.2.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.2.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.2.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

3.5.2.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.2.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.2.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

3.5.2.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

3.5.2.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.2.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.2.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.2.11 OCS: Section BR-11 – 6h Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.2.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

3.5.3 Built Heritage Resources and Cultural Heritage Landscapes

Please refer to **Appendix C1** for a description of methodology followed for identification of potential cultural heritage resources within the additional study area.

3.5.3.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.3.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.3.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

No Built Heritage Resources (BHRs) or Cultural Heritage Landscapes (CHLs) are located within the EPR Addendum study area.

3.5.3.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.3.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.3.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

No Built Heritage Resources (BHRs) or Cultural Heritage Landscapes (CHLs) are located within the EPR Addendum study area.

3.5.3.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

Ten (10) Built Heritage Resources (BHRs) were identified within the EPR Addendum study area, as summarized in **Table 3-21** below.

TABLE 3-21: SECTION BR-7 - SUMMARY OF BUILT HERTIAGE RESOURCES

Ref. Number	Rail Corridor	Property Type	Location	Ownership	Level of Heritage Recognition
BR-05	Barrie Corridor	Residence	365 Cotter Street, Newmarket Nearest Crossroads: Prospect St and Water St	Private	Potential BHR - Identified during field review
BR-06	Barrie Corridor	Residence	359 Cotter Street, Newmarket Nearest Crossroads: Prospect St and Water St	Private	Potential BHR - Identified during field review
BR-07	Barrie Corridor	Residence	353 Cotter Street, Newmarket Nearest Crossroads: Prospect St and Water St	Private	Potential BHR - Listed on a Municipal Heritage Register
BR-08	Barrie Corridor	Residence	349 Cotter Street, Newmarket Nearest Crossroads:	Private	Potential BHR - Identified during field review

Ref. Number	Rail Corridor	Property Type	Location	Ownership	Level of Heritage Recognition
			Prospect St and Water St		
BR-09	Barrie Corridor	Residence	341 Cotter Street, Newmarket Nearest Crossroads: Prospect St and Water St	Private	Potential BHR - Identified during field review
BR-12	Barrie Corridor	Various	115-117 Main Street South, Newmarket Nearest Crossroads: Main St S and Queen St	Private	Known BHR - Designated under Part IV of the Ontario Heritage Act (By-law 1988-143)
BR-13	Barrie Corridor	Commercial	450-474 Davis Drive East, Newmarket Nearest Crossroads: Main St N and Davis Dr E	Municipal	Known BHR - Designated under Part IV of the Ontario Heritage Act (By-law 1987-110; 2017-42); Formerly designated under the Heritage Railway Station Protection Act: 1 November 1992
BR-14	Barrie Corridor	GO Station	465 Davis Drive East, Newmarket Nearest Crossroads: Main St N and Davis Dr E	Town of Newmarket	Known BHR; MHC determined that this property met *Ontario Regulation* 9/06 (MHC Decision Form: 11 January 2017); Listed on a Municipal Heritage Register; Metrolinx Provincial Heritage Property (of local significance) (Conditional)[44]
BR-15	Barrie Corridor	Residence	91 Franklin Street, Newmarket Nearest Crossroads: Main St N and Davis Dr E	Private	Known BHR; MHC determined that this property met *Ontario Regulation* 9/06 (MHC Decision Form: 23 June 2017); Metrolinx Provincial Heritage Property (of local significance) (Conditional)
BR-16	Barrie Corridor	Residence	95 Franklin Street, Newmarket Nearest Crossroads: Main	Private	Potential BHR – Identified during field review

A Conditional Heritage Property is a Metrolinx-owned property or a property which may be acquired identified as having potential CHVI.

Ref. Number	Rail Corridor	Property Type	Location	Ownership	Level of Heritage Recognition
			St N and Davis Dr E		

3.5.3.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.3.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.3.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.3.11 OCS: Section BR-11 – 6h Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.3.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

Three (3) Built Heritage Resources (BHRs) were identified within the EPR Addendum study area, as summarized in **Table 3-22** below.

TABLE 3-22: SECTION BR-12 – SUMMARY OF BUILT HERITAGE RESOURCES

Ref. Number	Rail Corridor	Property Type	Location	Ownership	Level of Heritage Recognition
BR-18	Barrie Corridor	Mixed Use	33 Essa Road, Barrie Nearest Crossroads: Essa Rd and Tiffin St	Private	Potential BHR - Identified during field review
BR-23	Barrie Corridor	Residence	65 Tiffin Street, Barrie Nearest Crossroads: Essa Rd and Tiffin St	Private	Potential BHR - Identified during field review
BR-24	Barrie Corridor	Residence	69 Tiffin Street, Barrie Nearest Crossroads: Essa Rd and Tiffin St	Private	Potential BHR - Identified during field review

It should be mentioned that mile 62.30 to mile 62.80 and mile 62.80 to mile 63.40 are both within the Allandale Historic Neighborhood Defined Policy Area according to the Official Plan (City of Barrie, Planning and Building Services Department, 2018).

3.5.4 Archaeology

A review of the historic land use of the Barrie corridor indicates that it has been occupied by Indigenous peoples for thousands of years. It is situated within the traditional territory occupied by the ancestral Huron-Wendat, however the Northshore of Lake Ontario was abandoned around the turn of the sixteenth century while Simcoe County was occupied until the mid-seventeenth century. The corridor was subsequently utilized by the Seneca First Nation for hunting until the late seventeenth century; and, subsequently occupied by Ojibwa First Nations until 1805,1818 and, 1923 (AANDC 2013e; 2013f; Benn 2008; Ellis 2013; Williamson 2013).

The background research also acknowledges that since the turn of the eighteenth century, the Métis have lived throughout the Province of Ontario but are often muted in the historical record (MNC n.d.; Stone and Chaput 1978: 607,608). Since 1805, the section has been occupied by Euro-Canadian peoples and is situated within the former Townships of King, Vaughan, Whitchurch and York, County of York; since 1818, within the former Townships of Innisfil and West Gwillimbury, County of Simcoe; and, since the 1790s, within the former Townships of East Gwillimbury and King, County of York and the former Township of Innisfil, County of Simcoe (Benn 2008; Mika and Mika 1977; Miles & Co. 1878; Rayburn 1997). A review of 19th century mapping indicates that the corridor includes both historic features and transportation routes (Belden & Co. 1881; Hogg 1871; Miles & Co. 1878; Tremaine 1860).

Please see **Appendix D** for a copy of the Archaeological Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.5.4.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.4.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.4.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

Section BR-3 meets the following criteria which are indicative of archeological potential:

- Proximity to historic transportation route (Northern Railway);
- Proximity to historic features (farmsteads);
- Proximity to previously registered archaeological sites (AkGu-85); and
- Proximity to water source (Don River).

Segments within this study area are located in Borden block *AkGu*. According to the OASD (MHSTCI 2019), one previously registered archaeological site is located within one kilometre of the study area, which is not located within 50 metres. Site details are presented below in **Table 3-23**.

TABLE 3-23: SECTION BR-3 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGu-85	Elia United Cemetery/Gram's Appointment	Euro-Canadian	Burial	ASI 2012

This section has been subject to three previous archaeological assessments:

- (ASI 2010) Stage 1 and 2 Archaeological Resource Assessment of 555 Petrolia Road, Part of Lots 22 and 23, Concession 3 W.Y.S., Geographic Township of York, Formerly the City of North York, Now the City of Toronto P049-543-2010

- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016
- (ASI 2017d) Stage 1 Archaeological Assessment Barrie Rail Corridor Expansion Transit Project Assessment Process Newmarket Subdivision Mile 3.00 to Mile 63.00 City of Toronto, Regional Municipality of York and County of Simcoe (Former Townships of East Gwillimbury, King, Vaughan, Whitchurch and York, County of York and Former Township of Innisfil and West Gwillimbury, County Of Simcoe) P057-0837-2016

These criteria are indicative of the study area as having potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.5.4.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.4.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.4.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

Section BR-6 meets the following criteria which are indicative of archaeological potential:

- Proximity to Euro-Canadian settlement (Aurora and Town of Newmarket);
- Proximity to historic transportation route (Wellington Street, St. John's Sideroad, Mulock Drive, Davis Drive, Main Street West, Gorham Street, Northern Railway, Yonge Street);
- Proximity to historic features (farmsteads);
- Well-drained sandy soil (Clay loam, Pontypool sandy loam and Schomberg silt loam);
- Proximity to previously registered archaeological sites (see **Table 3-24**); and
- Proximity to water source (East Holland River).

Segments within this study area are located in Borden block *AlGu* and *BaGu*. According to the OASD (MHSTCI 2019), three previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented in **Table 3-24**.

TABLE 3-24: SECTION BR-6 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGu-512	Location 1	Euro-Canadian	Residential	Stantec 2017
BaGu-136	n/a	Euro-Canadian	Homestead	TAI 2006
BaGu-194	Knowles/Readman Site	Euro-Canadian	Unknown	WSP Canada 2017

This section has been subject to seven previous archaeological assessments:

- (ASI 1993) Archaeological Assessment of the Proposed Subdivision (19T-89074), Part of Lot 87, Concession 1, Town of Newmarket, Regional Municipality of York, Ontario 92-010, 93-016.
- (ASI 2001) Stage 1 Archaeological Assessment, Proposed Wellington Street Watermain Extension, From Berczy to the Orchard Heights Pumping Station, Town of Aurora, Regional Municipality of York, Ontario 2001-020-006.
- (ASI 2012a) Archaeological Assessment: Stage 1 Background Study and Property Inspection Upper York Sewage Solutions Full/Individual Environmental Assessment Study Former townships of North Gwillimbury, East Gwillimbury, Whitchurch, King North and King South, York County Regional Municipality of York, Ontario P223-055-2011.
- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016.
- (Archaeological Services Inc.) ASI 2017d) Stage 1 Archaeological Assessment Barrie Rail Corridor Expansion Transit Project Assessment Process Newmarket Subdivision Mile 3.00 to Mile 63.00 City of Toronto, Regional Municipality of York and County of Simcoe (Former Townships of East Gwillimbury, King, Vaughan, Whitchurch and York, County of York and Former Township of Innisfil and West Gwillimbury, County Of Simcoe) P057-0837-2016.
- (ASI 2017e) Stage 1 and 2 Archaeological Assessment St. Andrew's on Bayview Hydro One Easement Part of Lot 89, Concession 1 East of Yonge Street (Former Township of Whitchurch, County of York) Town of Newmarket, Regional Municipality of York, Ontario P094-0217-2016.
- (ASI 2018b) Stage 1 and 2 Archaeological Assessment Upper York Sewage Servicing: York-Durham Sewage System Modifications Part of Lots 88-97, Concession 1 East of Yonge Street, Lots 1-4, Concession 2 East of Yonge Street, and Lots 32-35, Concession 2 East of Yonge Street (Former Townships of Whitchurch and East Gwillimbury, County.

These criteria are indicative of the study area as having potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.5.4.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

Section BR-7 meets the following criteria which are indicative of archaeological potential:

- Proximity to Euro-Canadian settlement (Aurora and Town of Newmarket);
- Proximity to historic transportation route (Wellington Street, St. John's Sideroad, Mulock Drive, Davis Drive, Main Street West, Gorham Street, Northern Railway);
- Proximity to historic features (farmsteads);
- Well-drained sandy soil (Clay loam and Schomberg silt loam);
- Proximity to previously registered archaeological sites (see **Table 3-25**); and
- Proximity to water source (East Holland River);

Segments within this study area are located in Borden block *BaGu* and *AlGt*. According to the OASD (MHSTCI 2019), 13 previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in **Table 3-25**.

TABLE 3-25: SECTION BR-7 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGt-618	Angus Farm Site	Euro-Canadian	Farmstead, Agricultural	TLA 2015
BaGu-34	Cottontail	Woodland, Early	Findspot	ASI 1990
BaGu-59	Andrew Clubine	Euro-Canadian	Homestead	ASI 1992
BaGu-60	Mary Burkett	Euro-Canadian	Homestead	ASI 1992
BaGu-61	George Bodfish	Euro-Canadian	Homestead	ASI 1992
BaGu-69	Stanjon	Pre-Contact Indigenous	Findspot	ASI 1993
BaGu-70	Trent	Euro-Canadian	Building, Cottage	ASI 1994
BaGu-82	SW Newmarket 3	Pre-Contact Indigenous	Findspot	Robert Pearce 1999
BaGu-136	n/a	Euro-Canadian	Homestead	TAI 2006
BaGu-187	Pearson North	Euro-Canadian	Homestead	TLA 2015, 2016, 2017
BaGu-188	Pearson South	Euro-Canadian	Secondary deposit	TLA 2015, 2016, 2017
BaGu-191	Mordecai Sawmill Site	Euro-Canadian	Sawmill	EAS 2016
BaGu-194	Knowles/Readman Site	Euro-Canadian	Unknown	WSP Canada 2017

This section has been subject to a number of previous archaeological assessments:

- (ASI 1993) Archaeological Assessment of the Proposed Subdivision (19T-89074), Part of Lot 87, Concession 1, Town of Newmarket, Regional Municipality of York, Ontario92-010, 93-016.
- (ASI 2001) Stage 1 Archaeological Assessment, Proposed Wellington Street Watermain Extension, From Berczy to the Orchard Heights Pumping Station, Town of Aurora, Regional Municipality of York, Ontario 2001-020-006.
- (ASI 2012a) Archaeological Assessment: Stage 1 Background Study and Property Inspection Upper York Sewage Solutions Full/Individual Environmental Assessment Study Former townships of North Gwillimbury, East Gwillimbury, Whitchurch, King North and King South, York County Regional Municipality of York, Ontario P223-055-2011.
- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016.
- (ASI 2017d) Stage 1 Archaeological Assessment Barrie Rail Corridor Expansion Transit Project Assessment Process Newmarket Subdivision Mile 3.00 to Mile 63.00 City of Toronto, Regional

Municipality of York and County of Simcoe (Former Townships of East Gwillimbury, King, Vaughan, Whitchurch and York, County of York and Former Township of Innisfil and West Gwillimbury, County Of Simcoe) P057-0837-2016.

- (ASI 2017e) Stage 1 and 2 Archaeological Assessment St. Andrew's on Bayview Hydro One Easement Part of Lot 89, Concession 1 East of Yonge Street (Former Township of Whitchurch, County of York) Town of Newmarket, Regional Municipality of York, Ontario P094-0217-2016.
- (ASI 2018b) Stage 1 and 2 Archaeological Assessment Upper York Sewage Servicing: York-Durham Sewage System Modifications Part of Lots 88-97, Concession 1 East of Yonge Street, Lots 1-4, Concession 2 East of Yonge Street, and Lots 32-35, Concession 2 East of Yonge Street (Former Townships of Whitchurch and East Gwillimbury, County of York) Town of Newmarket, Regional Municipality of York, Ontario P1066-0013-2016.

These criteria are indicative of potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.5.4.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.4.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.4.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.4.11 OCS: Section BR-11 – 6 h Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.4.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

Section BR-12 meets the following criteria which are indicative of archaeological potential:

- Proximity to Euro-Canadian settlement (Allandale**,** Nantyr, Bramley, Craigvale, Stroud, Painswick);
- Proximity to historic transportation route (Northern Railway, Kempenfelt Bay**,** Bridge Street, Dissette Street);
- Proximity to historic features (farmsteads);
- Well-drained sandy soil (Sargeant sandy loam and tioga sandy loam);
- Proximity to previously registered archaeological sites (**Table 3-26**); and
- Proximity to water source (Innisfil Creeks, Hewitt's Creek, Kempenfelt Bay, Lover's Creek, Lake Simcoe).

Segments within this study area are located in Borden block *BcGv* and *BcGw*. According to the OASD (MHSTCI 2019), two previously registered archeological sites are located within one kilometre of the study area, with BcGw-69 being within 50 metres. Site details are presented below in **Table 3-26**.

TABLE 3-26: SECTION BR-12 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
BcGv-9	Tollendale Creek	Paleo-Indian; Archaic, Late; Woodland, Early, Late	Camp/campsite	Hunter 1977; Henry 1986; Knight 1986; Warrick 1986
BcGw-69	Allandale Station Lands	Ancestral Huron-Wendat	Village Ossuary	AFBY 2000, 2001; Amick 2010, 2011, 2013;

The Allandale site (BcGw-69) is located within the Historic Allandale Station complex. The site has been identified as an ancestral Huron-Wendat settlement and ossuary (AFBY Archaeological and Heritage Consultants 2000; AFBY Archaeological and Heritage Consultants 2001a; AFBY Archaeological and Heritage Consultants 2001b; AMICK Consultants Ltd. 2010; AMICK Consultants Ltd. 2011; AMICK Consultants Ltd. 2013), and Cultural Heritage Value or Interest (CHVI) has been established. Human remains have been documented on the Allandale site, particularly within the footprint of the historic station building.

This section has been subject to 11 (eleven) previous archaeological assessments:

- (ASI 2016) Stage 2 Archaeological Assessment (Property Assessment) 213 Minets Point Road and East Barrie Layover Facility Lots 10-11, Concession 14, Former Township of Innisfil City of Barrie, County of Simcoe P128-0140-2016.
- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016.
- (ASI 2017d) Stage 1 Archaeological Assessment Barrie Rail Corridor Expansion Transit Project Assessment Process Newmarket Subdivision Mile 3.00 to Mile 63.00 City of Toronto, Regional Municipality of York and County of Simcoe (Former Townships of East Gwillimbury, King, Vaughan, Whitchurch and York, County of York and Former Township of Innisfil and West Gwillimbury, County Of Simcoe) P057-0837-2016.
- (ASI 2017f) Stage 2 Archaeological Assessment (Property Assessment) Barrie Layover Facility - West Berm Lot 9 Concession 14, Former Township of Innisfil City of Barrie, County of Simcoe P128-0129-2016.
- (ASI 2018c) Stage 1 Archaeological Assessment Barrie-Collingwood Feeder Route Easement Area GO Rail Network Electrification Project Lots 5-8, Concession 14.
- (AFBY 2000) Archaeological Literature Review and Assessment Recommendations Regarding Allandale Railway Station Site: background study identified the head of Kempenfeldt Bay, and specifically the location of the Allandale Station, as an area with significant archaeological potential for Indigenous villages and burial sites. A program of archaeological testing and/or construction monitoring was recommended.
- (AFBY 2001a) Stage 3 Archaeological Assessment of the Allandale Site, (BcGw-69): New VR Broadcast Centre, Allandale Train Station, Part of Lots 7-10, Innisfil Township, City of Barrie: archaeological monitoring of fill removal in the vicinity of the historic train station location did not produce evidence of an ossuary, but settlement remains were recovered. Subsequent Stage 3 test excavation was completed in these areas, and artifacts were recovered from the mid-19th century and later, but also from an early 14th century Iroquoian settlement. The latter was likely occupied to take advantage of warm weather fishing beside Kempenfeldt Bay and the native trail that ran along the bay. CHVI for the site was established and Stage 4 mitigative excavations were recommended.

- (AFBY 2001b) Stage 4 Archaeological Mitigation of the Allandale Site (BcGw-69) Lots 7-10, Concession 14 (Formerly Innisfil Twp.) City of Barrie: an area in the middle of the site containing intact midden deposits capped by fill and measuring approximately 74 m^2 was excavated. An extensive sample of 16,700 artifacts and faunal/floral remains was recovered and analyzed, with ceramics dating the site to the late 12th to early 13th centuries. The faunal remains suggest that the site was a fishing station used during warm weather. Further mitigation of the site is not recommended, however, two adjacent areas were identified for further archaeological testing and/or monitoring during future construction/fill removal: to the west which includes the former Barrie Lawn Bowling Club property; and to the north, immediately surrounding the 1905 train station buildings which are still standing.
- (AMICK Consultants Ltd. 2010) Stage 1 Archaeological Background Research Allandale Train Station Part of Lot 8 & 9, Concession 14, (Geographic Township of Innisfil), City of Barrie: additional background study and field inspection were conducted in the vicinity of the Allandale site. The report recommended that Stage 2 archaeological assessment should be conducted on areas adjacent to the Allandale site that were not previously assessed by AFBY and cleared of archaeological concerns and/or recommended for archaeological monitoring construction/fill removal.
- (AMICK Consultants Ltd. 2011b) Stage 3 Archaeological Assessment of Human Remains within the Crawl Space of the “Office Building” at the Allandale Train Station, Barrie: burial remains identified from the crawl space of the office building at the historic Allandale Station were examined and limited excavation was conducted to establish provenience and whether additional material was present. The remains of at least two individuals were recovered from a very disturbed context, and there was no evidence of other intact burials.
- (AMICK Consultants Ltd. 2013)Stage 3 Site-specific assessment Allandale Site (BcGw-69), City of Barrie: additional test trenching and/or archaeological monitoring was conducted outside the building and adjacent to the crawl space location, and associated with the construction of a covered walkway and the installation of gas and electrical services. Concentrations of human bone were recovered from two areas, including the buried foundation associated with a former building associated with the Allandale Station complex. In these areas, additional excavation was recommended to recover all remaining bone collected for future interment.

These criteria are indicative of the study area as having potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.5.5 Land Use and Socio-Economic

Please see **Appendix E** for a copy of the Land Use and Socio-Economic Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.5.5.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.5.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.5.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

3.5.5.3.1 Existing Land Use

Land use between Downsview Park GO Station and the municipal border is entirely *Employment Areas*, crossed by *Utility Corridor* (the Finch Hydro Corridor). There are undeveloped lands on both sides of the rail corridor north of Finch Avenue West. Given that this is an employment/industrial area, there are no trails, large parks or other recreational amenities along this segment of the rail corridor. There are no hospitals, schools, places of worship, child-care centres or long-term centres in the vicinity of the rail corridor.

Entering the City of Vaughan, lands adjacent to the rail corridor are characterized by a mix of *Prestige* and *General Employment*, *Low-Rise Residential*, and pockets of *Natural Area*. Surrounding Highway 407 are lands designated as *Infrastructure and Utilities* and *Parkway Belt West Land.* North of Highway 407, the primary land use remains *General Employment*, though there are also large areas of *High-Rise Mixed Use*, *Open Space*, *Natural Area* (subject to change), and *Mid-Rise Mixed Use* at the Rutherford GO Station.

Official Plan land use designations along this section of the rail corridor is shown in **Figure BR-18** in **Appendix E**.

In Vaughan, one large park borders this section of the rail corridor: Langstaff Park, located at Langstaff Road. The rail corridor also passes over the Langstaff Multi Use Trail at Langstaff Road just east of Keele Street.

There are no hospitals, schools, places of worship, child-care centres or long-term care centres in the vicinity of the rail corridor.

3.5.5.3.2 Planned Land Use

Within Toronto, this section of the rail corridor passes through the Downsview Area Secondary Plan. The main goals of the Downsview Area Secondary Plan are to encourage the development of appropriate built-form while maintaining the character of the park and open space uses of the area. This will include the development of a major public park along Keele Street that is integrated with the Black Creek and West Don River water systems. Development will take advantage of the Downsview subway station and will allow for enough open space for future military activities. However, there are no Secondary Plan affecting the lands adjacent to this segment of the rail corridor. According to the City of Toronto's Parks and Recreation Facilities Master Plan, there are no planned recreational amenities within this segment of the rail corridor.

Under the City of Toronto Zoning By-law 569-2013 the rail corridor is zoned *Utility and Transportation,* and under the City of Vaughan Zoning By-law 1-88 the rail corridor is zoned *Parkway Belt Linear Facilities, Agricultural, Open Space Conservation, and Employment Area Transportation.*

3.5.5.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.5.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.5.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

3.5.5.6.1 Existing Land Use

Entering the Town of Aurora, land uses that abut the rail corridor to the south are primarily *Estate Residential* and *Cluster Residential*, with *Urban Residential 1* and *Public Parkland* to the north. As the rail corridor passes Henderson Drive and shifts north, land uses largely transition to employment uses including *General Industrial* and *Light Industrial/Service*, with the Aurora GO Station being located in *The Aurora Promenade*. Some open spaces are located along this stretch of the rail corridor, between Yonge Street and

Engelhard Drive. Official Plan Land use designations along this section of the rail corridor are shown in **Figures BR-49 to BR-50** in **Appendix E**.

The Aurora Trails Master Plan shows both existing and proposed trails near or crossing this section of the corridor. There are a number of existing soft surface special use trails which terminate at Industrial Parkway South (adjacent to the rail corridor), and a network of similar trails are located in a green space east of Bathurst Street, north of the rail corridor and south of Dawlish Avenue. Part of the Oak Ridges Moraine Trail also runs adjacent to the rail corridor on Ross Street.

The Sheppard's Bush Conservation Area is located adjacent to the west side of the rail corridor. Within these conservation lands lie two recreational trails: the Oak Ridges Trail and the Sheppard's Bush Trail. Located adjacent to the conservation area is a cycling route running along Industrial Parkway South.

There are no hospitals, schools, places of worship, child-care centres or long-term care centres in the vicinity of the rail corridor.

3.5.5.6.2 Planned Land Use

The rail corridor runs adjacent to the Yonge Street South Secondary Plan between Bathurst Street and Yonge Street. The primary goal of this plan is to guide future development to create a low intensity, environmentally sensitive, primarily residential precinct. Undeveloped areas between Yonge Street and Engelhard Drive are designated *General Industrial*.

The Aurora Trails Master Plan proposes a number of trails that either cross or would be located adjacent to this section of the rail corridor. These are:

- Oak Ridges Moraine Trail/soft surface multi-use trail with secondary railway crossing and underpass just north of Elderberry Trail;
- Soft surface multi-use trail with major railway grade separation just south of Henderson Drive;
- Soft surface multi-use trail with secondary rail crossing between Allaura Boulevard and Industrial Parkway South; and,
- Soft surface multi-use trail with major railway grade separation on Cousins Drive East and Industrial Parkway South.

There are no Secondary Plans affecting the lands adjacent segments within this rail corridor. Approaching the Aurora GO Station, the rail corridor is surrounded by *Mixed Use and Low Density Residential* land uses. To the west is largely a residential neighbourhood with parks throughout. East of the rail corridor in the vicinity of Mary Street, lies a large natural area and *Employment* lands. Located to the north are additional *Employment and Residential* lands, with pockets of *Institutional* areas. Approaching the Town of Newmarket, the area surrounding St. John's Sideroad is largely designated *Park/Open Space* which comprises *Environmental Protected* areas.

According to available information, no recreational amenities are planned within this segment of the rail corridor. Under the Town of Aurora Zoning By-law 6000-17, this segment of the rail corridor does not have a zoning designation.

3.5.5.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

3.5.5.7.1 Existing Land Use

The western portion of the rail corridor north of Wellington Street West *is Urban Residential 1*, with lands to the east, including some undeveloped lands, designated as *The Aurora Promenade*, *Light Industrial/Service* and *General Industrial*. Approaching the municipal border, land use becomes *Public and Private Parkland* around St. John's Sideroad. Entering the Town of Newmarket, land is predominantly a mix of *Parks and Open Space, Natural Heritage System*, and *Stable Residential*; however, a large section of *Mixed Employment* and *General Employment* is centred on Mulock Drive. Passing through the downtown area, the

rail corridor crosses lands designated as *Mixed Use* and *Parks and Open Space*. North of Davis Drive, land use transitions into primarily *Parks and Open Space* continuing to the municipal border.

Valhalla Park is located immediately west of the rail corridor. Allandale Park is a large park located behind a residential subdivision west of the rail corridor. Andrew's Valley Golf Club is located directly on the east side of the rail corridor, extending into the Town of Newmarket. The Tim Jones Trail, also referred to as the *Nokiidaa Trail* and the In-Boulevard Multi-Use Trail, crosses the rail corridor along St. John's Sideroad. A cycling route runs nearly parallel on the east side of the rail corridor along Industrial Parkway North. Aurora Montessori School is located directly adjacent to the rail corridor. The Newmarket Community Centre and Lions Hall is located directly west of the rail corridor.

Two large open spaces lie directly west of the rail corridor – Foxtail Ridge and Bailey Ecological Park. Within Foxtail Ridge is the meandering Holland River and the Tom Taylor Trail. The *Nokiidaa Trail* runs along Foxtail Ridge and Bailey Ecological Park. St. Andrew's Valley Club is located on the east side of the rail corridor. Baily Ecological Park and St. Andrew's Valley Golf Club extend into this segment of the rail corridor. The Humber River and unnamed cycling routes are located within Bailey Ecological Park.

Bailey Ecological Park transitions into Fairy Lake at Mulock Drive, with Fairy Lake Park eventually terminating at Water Street. Two smaller parks and a tennis centre surround the rail corridor: the Riverwalk Commons, All Our Kids Playpark and Keith Davis Tennis Centre. Additionally, the Audrie Sanderson Park and three multi-use trails are in the vicinity of the rail corridor: the Tom Taylor and *Nokiidaa Trail* cross the rail corridor at St. John's Sideroad East, and the *Nokiidaa Trail* parallels the rail corridor for most of its route between Timothy Street and the East Gwillimbury GO Station, with several crossover points. The Oak Ridges Moraine Trail crosses the rail corridor on Wellington Street, just north of the Aurora GO Station.

There are three relatively larger parks/open spaces along this section of the rail corridor: the Wesley Brooks Conservation Area, the Mabel David Conservation Area and Bayview Parkway. The Tom Taylor Trail and *Nokiidaa Trail* extend from the All Our Kids Playpark in the south to the Mabel Conservation Area to the north. The Newmarket Recreation Youth Centre and Sk8 Park is located within 100 metres of the rail corridor. The Mabel Davis Conservation Area and Bayview Parkway extend along the eastern side of the rail corridor towards the Town of East Gwillimbury. Official Plan Land use designations along this section of the rail corridor are shown in **Figures BR-50 to BR-59** in **Appendix E**.

There are no hospitals, schools, places of worship, child-care centres or long-term care centres in the vicinity of the rail corridor.

3.5.5.7.2 Planned Land Use

The rail corridor passes through the Newmarket Urban Centres Secondary Plan. The general purpose of this plan is to promote the Yonge Street and Davis Drive corridors as a node of activity characterized by a *Mixed Use* environment. There is a proposal for a new GO Station at Mulock Drive and Bayview Avenue. Planning for this station is currently underway. The undeveloped land directly south of the East Gwillimbury GO Station is designated as *Community Area*.

The Aurora Trails Master proposes the following trails/crossings within this section of the rail corridor:

- A soft-surface multi-use trail and major railway grade separation just north of Mark Street;
- A major railway grade separation on St. John's Sideroad; and,
- An underpass north of St. John's Sideroad, connecting with trails in Newmarket.

The Town of Newmarket's Active Developments Online Mapping indicates that the Gault Grove residential subdivision is planned to be developed on the east side of the rail corridor. This active proposal includes 28 townhome dwelling units at the time of the preparation of this EPR Addendum. The Town of Newmarket's Active Transportation Implementation Plan has also identified the location of a future signed cycling route along Silken Laumann Drive, as well as a cycling lane along McBean Avenue. Both cycling improvements will be located east of the rail corridor.

According to the Town of Newmarket's Active Developments Online Mapping, Pickering College is in the process of developing Phase Two of its campus master plan. Pickering College is located more than 100 metres east of the rail corridor. The Town of Newmarket's Active Transportation Implementation Plan also proposed a planned cycling route along Water Street.

Under the Town of Newmarket Zoning By-law 2010-40, segments within this rail corridor are zoned *Open Space, Institutional, Urban Centre, Mature Neighbourhood and Residential.*

This section of the rail corridor passes through the Urban Centres Secondary Plan which comprises a diverse mix of *Commercial*, *Residential*, *Institutional* and *Employment* uses. They are intended to develop unique identities, highlighted by architecture, public spaces, art and commerce.

The rail corridor traverses the Davis Drive Character Area, which is envisioned as a low to mid-rise residential area with opportunities for commercial uses on the ground floor. This character area is planned to comprise a mix of *Residential*, *Commercial* and *Employment* uses. In accordance with the Town of Newmarket's Active Transportation Implementation Plan, a cycling lane is planned to cross the rail corridor along Queen Street. In addition, the Town has proposed a new signed cycling route along Main Street South and a buffered cycling lane along Main Street North. The planned cycling lane is anticipated to extend along Main Street North.

3.5.5.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.5.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.5.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.5.11 OCS: Section BR-11 – 6h Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.5.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

3.5.5.12.1 Existing Land Use

The most significant use found along the rail corridor in Barrie is *Residential*, which comprises the majority of adjacent land in the vicinity of Allandale GO Station. Amongst these, variously-sized tracts of land are designated as *General Commercial*, *Open Space*, and *Environmental Protection Area*. The area that surround the Allandale GO Station is designated as *City Centre*. Large undeveloped areas are located at Country Lane and around the Allandale Waterfront GO Station. Official Plan Land use designations along this section of the rail corridor are shown in **Figures BR-102 to BR-104** in **Appendix E**.

The Barrie Sewage Treatment Facility is located in proximity to the Allandale GO Station and the Allandale feeder route at Bradford Road and Tiffin Street.

Three large parks border this section of the rail corridor: Lovers Creek Ravine, Allandale GO Station Park and South Shore Park. The Gables Park is another a large park located to the north of the rail corridor, extending to Barrie's waterfront. Wallins Natural Area is a small Open Space located along Hurst Drive and adjacent to the rail corridor. Pedestrian trails run throughout Gables Park both west and south of the rail corridor. A designated cycling lane runs along Hurst Drive adjacent to the rail corridor.

Allandale Station Park is located directly north of the rail corridor. Within this park is a large wooded area, open fields and pedestrian trails/walkways. Additionally, a portion of the Trans Canada Trail crosses the rail corridor on Minet's Point Road. Minet's Point Natural Area is located just west of Minet's Point Road. The Great Trail traverses the rail corridor at Minet's Point Road and extends north towards Allandale Station Park.

The Barrie waterfront includes portions of Allandale Station Park and the Great/Waterfront Trail as well as other pedestrian walkways. Cumberland Natural Area also lies directly south of the rail corridor. The Southshore Community Centre, situated within Allandale Station Park, is located within 100 metres of the rail corridor – north of Lakeshore Drive. Centennial Park and the Great Trail wrap around Kempenfelt Bay within this segment of Barrie, providing residents with lakefront recreational amenities, such as a park space, paved walkways and a sandy beach.

There are no hospitals, schools, places of worship, child-care centres or long-term care centres in the vicinity of the rail corridor.

3.5.5.12.2 Planned Land Use

This section of the rail corridor passes through two Secondary Plan areas. The main purpose of the Lakeshore Secondary Plan is to preserve natural space along Lake Simcoe. The primary purpose of the Allandale Secondary Plan is to promote and guide where growth should occur in order to meet population targets while creating mixed use environments in key locations.

The undeveloped lands at Country Lane are designated *Residential*, and those at the Allandale Waterfront GO Station are designated *City Centre*. This section of the corridor falls within the City Centre Revitalization Urban Growth Centre which seeks to increase density and is anticipated to transition to a mobility hub with medium to high residential density as a result of its proximity to Allandale GO Station.

There are no planned and approved recreational amenities bordering this section of the rail corridor, and the rail corridor does not have any active zoning designation under the City of Barrie Zoning By-law 2009-141.

3.5.6 Air Quality

Since 2017, Metrolinx has made significant changes to the planned rail infrastructure and train service for the GO Expansion Program, of which Electrification forms a part. The potential air quality impacts of trains and associated equipment and infrastructure have been assessed at both the regional scale, and locally in those segments of the corridors which are expected to experience an increase in diesel (i.e. non-electrified) powered equipment activity relative to the 2015 (pre-project or baseline) levels and which have sensitive receptors exposed to the rail corridor. While diesel service levels will remain the same or decrease (with electric train service taking up the planned increased service levels), there will be an increase in the number of diesel locomotives operating on some corridors. This is due to the need to power diesel trains with two locomotives rather than one during peak periods.

On the BR Corridor, increased service levels will be achieved by adding electrified trains and diesel train traffic levels will either remain the same or decrease in future. As such, an assessment of local air quality impacts was not undertaken.

A description of regional air quality baseline conditions is included in Section 4.8.7, and the Regional Air Quality Study (refer to **Appendix F1**) details baseline conditions within the project area.

3.5.7 Noise and Vibration

The noise and vibration baseline conditions within the additional study area for this discipline are detailed in **Appendix G4**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.4.

The BR Corridor Study Area begins at Parkdale Junction (off the Kitchener Corridor, in Toronto, west of the Union Station Rail Corridor) and ends at the Allandale GO Station in Barrie, approximately 97 kilometres in length. The Study Area is shown in **Figure 3-15**.

Noise receptors for this assessment include the following sensitive land uses:

- Residences;
- Hotels, motels and campgrounds;
- Schools, universities, libraries and daycare centres;
- Hospitals and clinics, nursing / retirement homes;
- Churches and places of worship;
- Planned residential developments with approved building permits from the Municipality; and
- Vacant lots that are currently zoned for residential use.

Noise receptors within the Study Area are mainly residential houses located adjacent to the BR Rail Corridor. In general, areas of receptors were identified using publicly available address point databases or through visual identification using publicly available satellite aerial images.

In the 2017 EPR, vacant lots were only assessed for residential developments with approved building permits. In this addendum, all vacant lots that are zoned for residential use (with or without building permits) were included in the assessment. All vacant residential lots within the Study Area were considered.

Representative noise receptors were chosen to simplify the presentation of results for a much larger number of receptors assessed. The representative noise receptors are summarized in **Table 3-27** to **Table 3-30**. Complete mapping of noise receptors is included in **Appendix G.**

For the assessment of vibration, the proximity of all noise receptors within the BR Corridor to changes in track alignment or special trackwork was assessed. The following areas were identified as areas of investigation for operational vibration:

- An additional 56 km of new track between Parkdale Junction and Bradford GO Station;
- An additional 14 km of new track between 6th Line (Innisfil) and Allandale GO Station; and
- 60 new switches along the Corridor.

Receptors for vibration include the same sensitive land uses as described in the noise assessment. However, future development locations that did not have approval for residential uses were not included since they would need to be designed to achieve appropriate vibration levels with the future rail infrastructure in place. The point of evaluation is defined as 5 to 10 m from the building foundation in a direction parallel to the tracks.

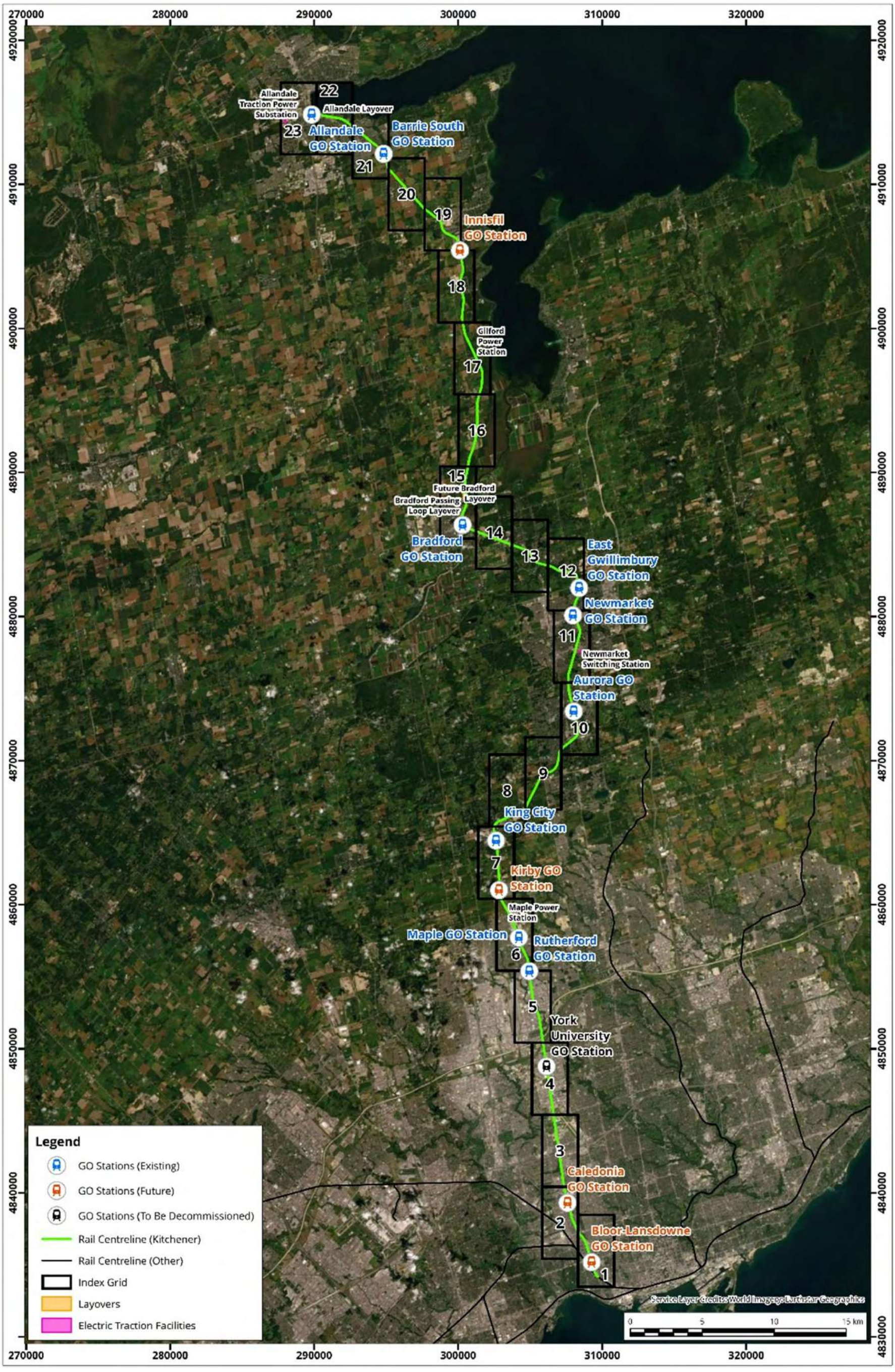

FIGURE 3-15: BARRIE NOISE & VIBRATION STUDY AREA

TABLE 3-27: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS - PARKDALE JUNCTION TO MAPLE GO

Track Section	Receptor ID[1]	Figure[45]	Description	Receptor Distance from Nearest Track (m)
Parkdale Junction to Bloor-Lansdowne GO	R001	D.1.1	Single Detached Dwelling	100
	R002	D.1.1	Townhouse	40
Bloor-Lansdowne GO to Caledonia GO	R003	D.1.1	Single Detached Dwelling	30
	R004	D.1.1	Single Detached Dwelling	100
	R005	D.1.1	Single Detached Dwelling	100
	R006	D.1.1	Townhouse	30
	R007	D.1.1	Single Detached Dwelling	40
	R008	D.1.1	Townhouse	40
	R009	D.1.1	Single Detached Dwelling	20
	R010	D.1.1	Single Detached Dwelling	10
	R011	D.1.1	Single Detached Dwelling	40
	R012	D.1.1	Single Detached Dwelling	20
	R013	D.1.1	Townhouse	50
	R014	D.1.1	Single Detached Dwelling	40
	R015	D.1.2	Single Detached Dwelling	40
	R016	D.1.2	Single Detached Dwelling	30
Caledonia GO to Downsview Park GO	R017	D.1.2	Single Detached Dwelling	50
	R018	D.1.2	Single Detached Dwelling	30
	R019	D.1.3	Townhouse	50
	R020	D.1.3	Single Detached Dwelling	30
	R021	D.1.3	Single Detached Dwelling	110
	R022	D.1.3	Single Detached Dwelling	270
	R023	D.1.3	Single Detached Dwelling	140
	R024	D.1.3	Townhouse	70
Downsview Park GO to Rutherford GO	R025	D.1.4	Place of Worship	80
	R026	D.1.4	Single Detached Dwelling	40
	R027	D.1.5	Single Detached Dwelling	40
	R028	D.1.5	Single Detached Dwelling	40
Rutherford GO to Maple GO	R029	D.1.6	Single Detached Dwelling	40
	R030	D.1.6	Single Detached Dwelling	50
	R031	D.1.6	Single Detached Dwelling	40
	R032	D.1.6	Single Detached Dwelling	50

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

[45] Figures referenced are included in **Appendix G4.**

TABLE 3-28: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS - MAPLE GO TO NEWMARKET GO

Track Section	Receptor ID[1]	Figure[46]	Description	Receptor Distance from Nearest Track (m)
Maple GO to Kirby GO	R033	D.1.6	Single Detached Dwelling	240
	R034	D.1.7	Single Detached Dwelling	360
Kirby GO to King City GO	R035	D.1.7	Single Detached Dwelling	30
	R036	D.1.7	Single Detached Dwelling	180
	R037	D.1.7	Single Detached Dwelling	60
	R038	D.1.7	Single Detached Dwelling	260
	R039	D.1.7	Single Detached Dwelling	80
King City GO to Aurora GO	R040	D.1.7	Single Detached Dwelling	110
	R041	D.1.7	Single Detached Dwelling	60
	R042	D.1.7	Single Detached Dwelling	40
	R043	D.1.8	Single Detached Dwelling	50
	R044	D.1.8	Single Detached Dwelling	100
	R045	D.1.8	Single Detached Dwelling	100
	R046	D.1.9	Single Detached Dwelling	20
	R047	D.1.9	Single Detached Dwelling	390
	R048	D.1.9	Single Detached Dwelling	60
	R049	D.1.9	Single Detached Dwelling	70
	R050	D.1.9	Single Detached Dwelling	40
	R051	D.1.9	Single Detached Dwelling	70
	R052	D.1.9	Single Detached Dwelling	50
	R053	D.1.9	Single Detached Dwelling	80
	R054	D.1.9	Single Detached Dwelling	50
	R055	D.1.9	Townhouse	30
	R056	D.1.10	Single Detached Dwelling	120
	R057	D.1.10	Single Detached Dwelling	90
Aurora GO to Newmarket GO	R058	D.1.10	Single Detached Dwelling	50
	R059	D.1.10	Single Detached Dwelling	40
	R060	D.1.10	School	40
	R061	D.1.10	Single Detached Dwelling	30
	R062	D.1.11	Single Detached Dwelling	470
	R063	D.1.11	Single Detached Dwelling	50
	R064	D.1.11	Single Detached Dwelling	120

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

[46] Figures referenced are included in **Appendix G4.**

TABLE 3-29: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS - AURORA GO TO INNISFIL GO

Track Section	Receptor ID[1]	Figure[47]	Description	Receptor Distance from Nearest Track (m)
Aurora GO to Newmarket GO	R065	D.1.11	Single Detached Dwelling	370
	R066	D.1.11	Single Detached Dwelling	190
	R067	D.1.11	Single Detached Dwelling	30
	R068	D.1.11	Apartment Building	130
	R069	D.1.11	Apartment Building	40
	R070	D.1.11	Single Detached Dwelling	130
	R071	D.1.11	Single Detached Dwelling	20
	R072	D.1.11	Single Detached Dwelling	240
	R073	D.1.11	Single Detached Dwelling	20
Newmarket GO to East Gwillimbury GO	R074	D.1.11	Single Detached Dwelling	260
	R075	D.1.12	Townhouse	90
	R076	D.1.12	Single Detached Dwelling	330
	R077	D.1.12	Single Detached Dwelling	30
	R078	D.1.12	Single Detached Dwelling	300
East Gwillimbury GO to Bradford GO	R079	D.1.12	Single Detached Dwelling	60
	R080	D.1.12	Single Detached Dwelling	460
	R081	D.1.12	Single Detached Dwelling	200
	R082	D.1.12	Single Detached Dwelling	30
	R083	D.1.12	Single Detached Dwelling	20
	R084	D.1.13	Single Detached Dwelling	150
	R085	D.1.13	Single Detached Dwelling	150
	R086	D.1.13	Single Detached Dwelling	30
	R087	D.1.13	Single Detached Dwelling	30
	R088	D.1.13	Single Detached Dwelling	20
	R089	D.1.13	Single Detached Dwelling	70
	R090	D.1.13	Single Detached Dwelling	20
	R091	D.1.14	Hotel	80
	R092	D.1.14	Single Detached Dwelling	80
Bradford GO to Innisfil GO	R093	D.1.15	Single Detached Dwelling	220
	R094	D.1.15	Single Detached Dwelling	170
	R095	D.1.15	Single Detached Dwelling	230
	R096	D.1.16	Single Detached Dwelling	120

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

[47] Figures referenced are included in **Appendix G4.**

TABLE 3-30: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS - BRADFORD GO TO ALLANDALE GO

Track Section	Receptor ID[1]	Figure[48]	Description	Receptor Distance from Nearest Track (m)
Bradford GO to Innisfil GO	R097	D.1.16	Single Detached Dwelling	90
	R098	D.1.16	Single Detached Dwelling	100
	R099	D.1.17	Single Detached Dwelling	50
	R100	D.1.17	Single Detached Dwelling	50
	R101	D.1.17	Single Detached Dwelling	50
	R102	D.1.17	Single Detached Dwelling	50
	R103	D.1.17	Single Detached Dwelling	200
	R104	D.1.18	Single Detached Dwelling	100
	R105	D.1.18	Single Detached Dwelling	100
	R106	D.1.18	Single Detached Dwelling	70
	R107	D.1.18	Single Detached Dwelling	50
	R108	D.1.18	Single Detached Dwelling	60
	R109	D.1.18	Single Detached Dwelling	170
Innisfil GO to Barrie South GO	R110	D.1.19	Single Detached Dwelling	60
	R111	D.1.19	Single Detached Dwelling	50
	R112	D.1.19	Single Detached Dwelling	40
	R113	D.1.20	Single Detached Dwelling	50
	R114	D.1.20	Single Detached Dwelling	40
	R115	D.1.20	Single Detached Dwelling	40
	R116	D.1.20	Single Detached Dwelling	50
	R117	D.1.20	Single Detached Dwelling	70
	R118	D.1.21	Single Detached Dwelling	50
Barrie South GO to Allandale GO	R119	D.1.21	Single Detached Dwelling	50
	R120	D.1.21	Single Detached Dwelling	50
	R121	D.1.21	Single Detached Dwelling	80
	R122 [2]	D.1.23	Single Detached Dwelling	80
	R123	D.1.22	Single Detached Dwelling	20
	R124	D.1.22	Single Detached Dwelling	40

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

[2] Receptor R122 represents the worst-case receptor location for the Allandale TPS, which is west of the Allandale GO Station. The distance presented represents the distance to the Allandale TPS, as the receptor is more than 1740 m from the closest trackwork within the Study Area.

Existing noise barriers are defined as barriers built as of August 2019 or planned barriers identified during Environmental Assessments completed prior to August 2019. Existing barriers in some cases include

[48] Figures referenced are included in **Appendix G4.**

barriers triggered by the 2017 Electrification EPR. Existing barriers were included in the Pre-project, and Post-project modelling scenarios. The replacement of existing or planned noise barriers located on the Metrolinx Right-of-Way was not considered in this assessment. Mitigation was therefore not investigated in locations with existing or planned barriers. However, filling in of gaps between existing noise barriers and horizontal extensions of these barriers were investigated, subject to technical and economic feasibility.

3.5.8 Visual

Please see **Appendix H** for a copy of the Visual Assessment Report, which details the baseline conditions assessment completed for this discipline.

A detailed description of the methodology used to classify areas of potential visual impact can be found in **Section 3.3.8.**

3.5.8.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.8.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.8.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

This section is located within the City of Toronto, traversing a dense *Employment/Industrial* zone. The proposed track extends within the existing rail ROW, south of Apollo Place to the York University GO Station. The proposed track upgrades are to occur within the existing Metrolinx rail ROW; therefore, the existing visual baseline conditions are classified as *Negligible* (see **Figure 3-16**).

FIGURE 3-16: AERIAL VIEW OF THE PROPOSED INFRASTRUCTURE ALONG BARRIE CORRIDOR IN THE VICINITY OF YORK UNIVERSITY GO STATION (LOOKING WEST)[49]

3.5.8.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.8.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.8.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

Segments within this section are located within the Town of Aurora and are primarily designated as *Mixed Use* and *Residential*. There is also park/open space land uses along the corridor. Sheppard's Bush Conservation Area is also in close proximity to the rail corridor. The existing baseline conditions in this segment are classified as *Low*.

OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

The proposed infrastructure continues north in the Town of Aurora, running nearly parallel to the Aurora Community Arboretum and beyond. The proposed track passes through *Low Density Residential* areas that abuts the rail ROW on the west, *Employment/Industrial*, and many large *Parks and Open Space* areas (see

[49] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange; Metrolinx-owned property is depicted in red.

Figure 3-17). The proposed track upgrades will occur within the existing Metrolinx rail ROW, thus classify the existing visual baseline conditions as *Negligible*.

FIGURE 3-17: AERIAL VIEW OF THE PROPOSED INFRASTRUCTURE ALONG BARRIE CORRIDOR IN THE VICINITY OF AURORA GO STATION (LOOKING NORTH)[50][51]

Entering the Town of Newmarket, the areas surrounding the rail corridor are largely *Residential*, *Natural*, and *Parks and Open Space* with recreational amenities, such as the St. Andrews Valley Golf Course located on the east side of the rail corridor. The potential changes to the existing views from the golf course are minimal as the existing vegetation provides screening and golfers are typically not close to the rail ROW.

Through much of this area, single-family homes line the open space along the creek. In some areas, the homes are adjacent to the rail ROW, while others are farther back. The proposed track upgrades will occur within the existing Metrolinx rail ROW, resulting in a *Negligible* existing visual baseline conditions (See **Figure 3-18**).

[50] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange; Metrolinx-owned property is depicted in red.
[51] Note to draft: figure to be revised in final version of report.

FIGURE 3-18: AERIAL VIEW OF THE PROPOSED INFRASTRUCTURE ALONG BARRIE CORRIDOR IN THE VICINITY OF ST. ANDREWS VALLEY GOLF COURSE (LOOKING NORTH)[52]

The proposed track continues north through the Town of Newmarket, *Employment/Industrial* areas and *Low-Density Residential* areas situated more than 100 metres to the east and west of the rail corridor. The proposed track upgrades are proposed to occur within the existing Metrolinx rail ROW; therefore, there are no vertical disturbances to the existing track bed. The existing visual baseline conditions are classified as *Negligible* (see **Figure 3-19**).

[52] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange; Metrolinx-owned property is depicted in red.

FIGURE 3-19: AERIAL VIEW OF PROPOSED INFRASTRUCTURE ALONG BARRIE CORRIDOR WITHIN THE TOWN OF NEWMARKET (LOOKING NORTH)[53,54]

This proposed track continues through the Newmarket GO Station. The station is located behind a retail complex, which was converted from an industrial building, and is surrounded by other residential and commercial uses which are adjacent to the rail ROW. The proposed track upgrades are proposed to occur within the existing Metrolinx rail ROW. The views of the passengers coming to or departing the station, as well as the views from the surrounding area are not anticipated to be altered; therefore, the existing visual baseline conditions are classified as *Negligible* (see **Figure 3-20**).

[53] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange; Metrolinx-owned property is depicted in red.
[54] Previously approved electrification infrastructure, including Tap/TPF sites and feeder routes (as applicable) are not depicted

FIGURE 3-20: AERIAL VIEW OF THE PROPOSED INFRASTRUCTURE ALONG THE BARRIE CORRIDOR IN THE VICINITY OF NEWMARKET GO STATION (LOOKING NORTHWEST)[55]

The Mabel Davis Conservation Area is to the east of the rail corridor and *Residential* neighbourhoods that back onto the rail ROW are to the west. The conservation area is heavily treed, while the neighbourhood is set back from the ROW, with an abundance of trees to screen the passing trains. The proposed track upgrades are to occur within the existing Metrolinx rail ROW; therefore, the existing visual baseline conditions are classified as *Negligible.*

3.5.8.7 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.8.8 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.8.9 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.8.10 OCS: Section BR-11 – 6 h Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

[55] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange; Metrolinx-owned property is depicted in red.

3.5.8.11 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

This section of the rail corridor is located in close proximity to Kempenfelt Bay in Barrie, which lies on the western edge of Lake Simcoe. Beyond Little Avenue, views to the waterfront from the rail ROW open across Lakeshore Drive. The rail corridor is lined on both sides with single-family residential development that is screened with vegetation along both sides of the corridor and large parks and open space along the waterfront. At the closest point, a residential dwelling is located approximately 20 metres from the rail ROW. Since the proposed track upgrades are to occur within the existing Metrolinx rail ROW, the existing visual baseline conditions are classified as *Negligible* (see **Figure 3-21**).

FIGURE 3-21: AERIAL VIEW OF PROPOSED INFRASTRUCTURE NEAR KEMPENFELT BAY (LOOKING WEST)[56]

This section is primarily located within a *Residential* area; however, residential dwellings are more than 20 metres from the rail corridor. The proposed track upgrades are to occur within the existing Metrolinx rail ROW, suggesting the existing conditions will be minimally impacted. Based on this, the existing visual baseline conditions are classified as *Negligible.*

Allandale Station Park (also known as Southshore Park) extends around Kempenfelt Bay in the vicinity of Allandale GO Station. Users of this park have a clear view of the rail corridor and Allandale GO Station, including the existing storage yard. The views from the park towards the Allandale GO Station are not anticipated to change as the proposed track upgrades are proposed within the existing Metrolinx rail ROW, resulting in no vertical disturbances. Thus, the existing visual baseline conditions are classified as *Negligible* (see **Figure 3-22**).

[56] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange; Metrolinx-owned property is depicted in red.

FIGURE 3-22: AERIAL VIEW OF ALLANDALE WATERFRONT AREA (LOOKING SOUTH)[57].

The Allandale Waterfront GO Station is the Barrie Corridor's terminus station. Located here is a small parking lot, as well as a drop-off and pick-up areas for both buses and cars immediately in front of the station. On the other side of the station driveway is the Allandale Station building, a known built heritage resource with Part IV Designation under the OHA (By-law 2009-114), designated under the Heritage Railway Stations Protection Act and Ontario Heritage Trust Conservation Easement.

Although, the site is recognized for its cultural relevance, the track upgrades are proposed to occur within the existing Metrolinx rail ROW. The views to and from the old station building and surrounding areas are not anticipated to change; therefore, the existing visual baseline conditions are classified as *Negligible*.

3.5.9 Utilities

Please see **Appendix I** for a copy of the Utilities Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.5.9.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.9.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

[57] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange; Metrolinx-owned property is depicted in red.

3.5.9.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

3.5.9.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.9.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.9.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

3.5.9.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

3.5.9.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.9.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.9.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.9.11 OCS: Section BR-11 – 6h Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.9.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

3.5.10 EMI & EMF

Please see **Appendix J** for a copy of the EMI & EMF Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.5.10.1 EMI Sensitive Sites

Based on the baseline mapping for the Barrie Corridor, no EMI sensitive sites were identified within Zone 3 or closer (i.e., less than 100 m from the closest track) or between 100 metres and 250 metres (the conservative evaluation zone) from the corridor.

3.5.10.2 ELF EMF Measurements

The tables in Section 4.2.5.2 to Section 4.2.5.13 in the 2017 Electrification EMI/EMF Baseline Conditions Report (Appendix J1 of 2017 EPR) present the ELF EMF measurements at select points along the Barrie Corridor. There were no high-ELF (> 10 mG) areas along this corridor, so there are no locations where post-electrification measurement of ELF EMF is recommended.

3.5.11 Stormwater Management

Please see **Appendix K** for a copy of the Preliminary Stormwater Management Report, which details the baseline conditions assessment completed for this discipline.

3.5.11.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.11.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.11.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

3.5.11.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.11.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.11.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

3.5.11.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

3.5.11.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.11.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.11.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.11.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.11.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

3.5.12 Groundwater and Wells

Please see **Appendix L** for a copy of the Hydrogeological Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.5.12.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.12.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.12.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

SPPs have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater WHPA and surface water IPZ. This study area falls within the IPZ-3 intake protection zone within the Toronto SPA.

With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. This data does not reflect ground water patterns in deeper aquifers. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-31** below.

TABLE 3-31: SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
BR	BR-3	2 – 6	0.005	southeast

This section of the study is within the network of the Don River Sub-watershed. The major groundwater discharges in the sub-watershed occur on the south slope of the ORM, where flow occurs from the ORM Aquifer Complex and along the south glacial Lake Iroquois shoreline (close to Eglinton Avenue). The sub-watershed is one of the most urbanized in the country – nearly 80% of the drainage area is urbanized (TRCA, 2009).

The Don River's surface water quality is considered poor and highly reflective of urbanization and lack of control of stormwater drainage (TRCA, 2015). Concentrations of total suspended solids, turbidity, chloride, ammonia and nutrients are typically elevated throughout the watershed.

According to the 2017 Electrification assessment along this segment of corridor, there were 28 domestic supply wells, seven (7) industrial/commercial supply wells, one (1) agricultural supply well, two (2) municipal supply wells, and two (2) supply wells of unknown type identified within 500 m of the rail corridor in this section. However, the section is characterized by an urban setting and the use of private water wells in this area is likely negligible. There are three (3) waterbodies, an unnamed pond, Don River West Branch, and Westminster Creek, located within 500 metres of the rail corridor.

3.5.12.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.12.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.12.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

SPPSs have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater WHPA and surface water IPZ. This study area falls within the WHPA-B (Aurora Well No. 5 WHPA-b, Aurora Wells No. 1,2,3 & 4 WHPA-B) wellhead protection area within the Lake Simcoe and Couchiching/Black River SPA. The regional physiography in this area is defined as Schomberg Clay Plains with the surficial geology at BR-6 described as being predominantly classified as massive, well laminated fine-grained soils with channels of alluvial deposits resulting from watercourse valleys (Chapman and Putnam, 1984).

With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. Nearby waterbodies and watercourse may also have an influence on the observed gradients in the case of BR-6 (Holland River East Branch) due to surface water level fluctuations. This data does not reflect ground water patterns in deeper aquifers. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-32** below.

TABLE 3-32: SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
BR	BR-6 – BR-7	2 – 16	0.0012	north

This section of the study is within the network of the East Holland Sub-watershed. The headwaters of the watershed are from discharge springs and seepages along the northern flanks of the ORM, with flows to the north and discharge to Cooks Bay in Lake Simcoe. The watershed primarily comprises urban and agricultural land uses. There are two waterbodies located within 500 metres of the study area segment: Tannery Creek and Holland River East Branch. Tannery Creek is located about 300 metres southwest of the study area segment at its closest point and is separated by significant development and associated infrastructure (e.g. underground utilities). The Holland River East Branch is located 300 metres east from the infrastructure footprint with a drop of 15 metres in elevation between the Site and the River.

Concentrations of phosphorus, total suspended solids, iron, aluminum, and zinc are generally elevated in this watershed (Lake Simcoe Region Conservation Authority, 2010).

According to the 2017 Electrification assessment along this segment of corridor, there were 113 domestic supply wells, four (4) agricultural supply well, one (1) commercial/industrial supply well and one (1) supply well of unknown type identified within 500 metres of this section of the rail corridor. This section is characterized by a mixed urban and rural setting with possible private water well use.

3.5.12.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

SPPs have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater WHPA and surface water IPZ. This study area falls within the WHPA-B (Aurora Well No. 5 WHPA-b, Aurora Wells No. 1,2,3 & 4 WHPA-B), WHPA-C (Newmarket/Aurora WHPA-C) and WHPA-D (Newmarket/Aurora WHPA-D) wellhead protection area within the Lake Simcoe and Couchiching/Black River SPA.

With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. Nearby waterbodies and watercourse may also have an influence on the observed gradients in the case of BR-6 (Holland River East Branch) due to surface water level fluctuations. This data does not reflect ground water patterns in deeper aquifers. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-33** below.

TABLE 3-33: SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
BR	BR-6 – BR-7	2 – 16	0.0012	north

This section of the study is within the network of the East Holland Sub-watershed. The headwaters of the watershed are from discharge springs and seepages along the northern flanks of the ORM, with flows to the north and discharge to Cooks Bay in Lake Simcoe. The watershed primarily comprises urban and agricultural land uses.

Concentrations of phosphorus, total suspended solids, iron, aluminum, and zinc are generally elevated in this watershed (LSRCA, 2010).

There were 15 domestic supply wells, eight (8) agricultural supply wells, two (2) commercial/industrial supply wells, two (2) municipal supply wells, and one (1) supply well of unknown type identified within 500 metres of this section of the rail corridor. However, this section is characterized by an urban setting and the use of private water wells in this area is likely negligible. There are five (5) waterbodies, Aurora (McKenzie) Marsh Wetland Complex, Newmarket Wetland, Rogers Reservoir, Holland River East Branch, and Clubinis Creek, located within 500 metres of the rail corridor.

This study area comprises the Mackenzie Marsh Wetland complex which is both a Provincially Significant Wetland and unevaluated wetland. Other wetlands are also present.

There are a number of watercourse crossings identified in the Barrie Corridor. The crossings are CRA fisheries providing warmwater habitat. The features include a minor tributary of the Humber River which includes ephemeral/intermittent flow towards the south and west. A headwater drainage feature is located within the wet meadow on the west side. Tannery Creek includes permanent flow towards the north, east and west depending on the creek area. Channels are defined along the rail line. The East Holland River comprises permanent flow towards the north and west. The river is highly channelized and hardened with subterranean flows upstream and gabion baskets along banks in select areas. Additionally, there is a small tributary of the East Holland River called Wesley Creek which has permanent flow, and defined channels with evidence of erosion and high flows. East Holland River includes permanent flow primarily north. The river is highly channelized and hardened with subterranean flows upstream and gabion baskets along banks in select areas.

3.5.12.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.12.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.12.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.12.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.5.12.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

SPPs have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater WHPA and surface water IPZ. This study area falls within the IPZ-2 (Lakes Simcoe and Couchiching/Black River), WHPA-B (Wellhead Protection Area B), WHAP-C (Wellhead Protection Area C), and WHPA-D (Lakes Simcoe and Couchiching/Black River and Wellhead Protection Area D) wellhead protection areas within the Lake Simcoe and Couchiching/Black River SPA.

With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. Nearby waterbodies and watercourse may also have an influence on the observed gradients in the case of BR-12 (Lake Simcoe) due to surface water level fluctuations. This data does not reflect ground water patterns in deeper aquifers. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-34** below.

TABLE 3-34: SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
BR	BR-12	2 – 10	0.035	north

This section of the study is within the network of the Barrie Creek Sub-watershed. This watershed is located along the southwestern shore of Lake Simcoe. The LSRCA has included the Hewitt's Creek, Lovers Creek and Barrie Creek sub-watersheds together for the purposes of sub-watersheds planning (LSRCA, 2012). The watersheds drain from west to east and empty into Lake Simcoe, flowing primarily through developed urban areas.

According to the 2017 Electrification assessment along this segment of corridor, there were 139 domestic supply wells, two (2) agricultural supply wells, six (6) commercial/industrial supply wells, five (5) municipal supply wells and six (6) supply wells of unknown type identified within 500 metres of the rail corridor in this section. This section is characterized by a mixed urban and rural setting with possible private water well use. There are three (3) waterbodies, Lake Simcoe, Whiskey Creek, and Lovers Creek, located within 500 metres of the rail corridor.

Within these watersheds, concentrations of most parameters are below relevant quality guidelines. However, Chloride, phosphorus, TSS, iron, zinc and copper levels are exhibiting increasing rates. Nitrate levels, however, are decreasing.

This study area includes an unevaluated shallow marsh wetland adjacent to the corridor. This feature appears to be a constructed stormwater management pond. The area also has a water crossing within Whiskey Creek including a permanent flow towards the north. The creek is a wider defined channel with slow flow.

3.6 Stouffville Rail Corridor

3.6.1 Natural Environment

A Natural Environment Assessment Report (refer to **Appendix A**) was prepared, which details the baseline condition within the additional study area.

3.6.1.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.1.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.1.3 OCS: Section SV-3 – Milliken Station to Unionville Station

3.6.1.3.1 Terrestrial

This section of the corridor is within Ecoregion 7E-4.Surrounding land use consists primarily of residential, institutional and planned mix use high rise.

3.6.1.3.1.1 Wetlands

No evaluated wetlands features are present within this section of the Project study area.

3.6.1.3.1.2 Vegetated Areas

The study area contains a large proportion of Commercial and Institutional Lands (CVC), Transportation and Utilities (CVI), and Residential Lands (CVR). The vegetated communities within this corridor section are limited to Cultural Meadow (CUM), Cultural Woodland (CUW) and Deciduous Forest (FOD).

3.6.1.3.2 Wildlife

The small patches of CUW may provide foraging and nesting habitat for breeding birds and the CUM communities may potentially provide foraging habitat for pollinating insects.

3.6.1.3.3 Aquatic

There are no watercourses within this portion of the study area.

3.6.1.3.4 Species at Risk

Two species has the potential to occur within the study area: Monarch and Nine-spotted Lady Beetle.

3.6.1.3.5 Significant Wildlife Habitat

No SWH candidate or confirmed areas were identified within these segments of the Project study area during previous studies completed for the 2017 GO Rail Network Electrification EPR (Natural Environment Baseline Conditions Report, Morrison Hershfield [2017]). An evaluation completed in 2019 (NT&F Natural Environment Baseline Conditions Report, Gannett Fleming [2020]) determined SWH is limited with candidate habitats occurring in association with the naturalized plantation (woodland) and Rouge River. Candidate habitats in addition to bat roosts may include: Raptor Nesting – Woodland Habitat (plantation) and Special Concern, and Rare Wildlife Species. SWH habitats and criteria identified are outlined in **Appendix A**.

3.6.1.3.6 Designated Areas

This portion of the study area is located within the jurisdiction of TRCA and Aurora District MNRF. There are no designated areas within this portion of the study area.

3.6.1.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

3.6.1.4.1 Terrestrial

This section of the corridor is within Ecoregion 7E-4. Surrounding land use consists primarily of residential, institutional and planned mix use high rise.

3.6.1.4.1.1 Wetlands

No evaluated wetlands features are present within this section of the Project study area.

3.6.1.4.1.2 Vegetated Areas

The study area contains a large proportion of Commercial and Institutional lands (CVC), Transportation and Utilities (CVI), and Residential Lands (CVR). The larger vegetated communities within this corridor consist of Green Land (CGL), Swamp (SW), Deciduous Woodlands (WOD), Cultural Meadow (CUM) and Marsh (MA).

3.6.1.4.1.3 Wildlife

The CUM communities may provide potential habitat for pollinating insects. The WOD and CGL communities may provide foraging and nesting habitat for breeding birds.

3.6.1.4.2 Aquatic

There is one watercourse within the study area: Rouge River. The Rouge River is classified as Valleyland/Stream Corridors and is part of the City of Markham's Natural Heritage Network.

3.6.1.4.3 Species at Risk

Three species have the potential to occur within the study area: Monarch, Nine-spotted Lady Beetle, and Redside Dace.

3.6.1.4.4 Significant Wildlife Habitat

No SWH candidate or confirmed areas were identified within this section of the Project study area during previous studies completed for the 2017 GO Rail Network Electrification EPR (Natural Environment Baseline Conditions Report, Morrison Hershfield [2017]). An evaluation completed in 2019 (NT&F Natural Environment Baseline Conditions Report, Gannett Fleming [2020]) determined SWH is limited with candidate habitats occurring in association with the naturalized plantation (woodland) and Rouge River. Candidate habitats in addition to bat roosts may include: Raptor Nesting – Woodland Habitat (plantation) and Special Concern, and Rare Wildlife Species.

3.6.1.4.5 Designated Areas

This portion of the study area is located within the jurisdiction of TRCA and Aurora District MNRF. The Greenbelt Urban River Valley is within the study area.

3.6.1.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

3.6.1.5.1 Terrestrial

This section of the corridor is within Ecoregion 7E-4. The surrounding land use consists primarily of residential, commercial and institutional uses.

3.6.1.5.1.1 Wetlands

There is one small identified unevaluated wetland within this portion of the study area.

3.6.1.5.1.2 Vegetated Areas

The study area contains a large proportion of Transportation and Utilities (CVI) and Residential Lands (CVR) with some Commercial and Institutional Lands (CVC). The vegetated communities within this corridor section included Cultural Meadow (CUM), Green Land (CGL), and Deciduous Thicket (THD).

3.6.1.5.1.3 Wildlife

The CUM communities may potentially provide foraging habitat for pollinating insects. The CGL and THD communities may provide foraging and nesting habitat for breeding birds.

3.6.1.5.2 Aquatic

There is one watercourse within the corridor segment: Mt. Joy Creek**.** The watercourse corridor is identified as Valley/Stream Corridor and is part of the City of Markham's Natural Heritage Network. This crossing is located on the division line between SV-5 and SV-6. Mt. Joy Creek is conveyed under the corridor by a culvert.

3.6.1.5.3 Species at Risk

Five species have the potential to occur within the study area: Butternut, Chimney Swift, Monarch, Nine-spotted Lady Beetle, and Red-headed Woodpecker.

3.6.1.5.4 Significant Wildlife Habitat

No SWH candidate or confirmed areas were identified within these segments of the Project study area during previous TPAP studies. An evaluation completed in 2019 (NT&F Natural Environment Baseline Conditions Report, Gannett Fleming [2020]) determined SWH is limited with candidate habitats occurring in association with Mount Joy Creek. Candidate habitats in addition to bat roosts may include: Turtles Nesting Habitat and Amphibian Breeding Habitat (Wetlands).

3.6.1.5.5 Designated Areas

This portion of the study area is located within the jurisdiction of TRCA and Aurora District MNRF. The Greenbelt Urban River Valley is located within the study area.

3.6.1.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

3.6.1.6.1 Terrestrial

This section of the corridor is within Ecoregion 7E-4. Surrounding land use consists primarily of residential, commercial and institutional uses.

3.6.1.6.1.1 Wetlands

There are several identified unevaluated wetlands within this portion of the study area.

3.6.1.6.1.2 Vegetated Areas

The study area contains a large proportion of Commercial and Institutional Lands (CVC), Transportation and Utilities (CVI), and Residential Lands (CVR). Several Constructed (CV) areas were also identified. The vegetated communities within this corridor section include Deciduous Woodland (WOD), Cultural Meadow (CUM), Deciduous Thicket (THD), Marsh (MA), Shallow Marsh (MAS), Agriculture (AG), Swamp (SW), and Deciduous Forest (FOD) communities.

3.6.1.6.1.3 Wildlife

The SW and MA communities within the number of unevaluated wetlands in this study area may potentially provide staging, foraging and overwintering habitat for turtles and breeding and foraging habitat for

amphibian and marsh birds. The CUM and AG communities may potentially provide nesting and foraging habitat for grassland birds and foraging habitat for pollinating insects. The WOD communities may potentially provide nesting and foraging habitat for breeding birds.

During the 2019 field visit, several turtle (species unknown) depressions were observed in these segments of the Project study area along the tracks and generally within 100 metres of the small wetland communities.

3.6.1.6.2 Aquatic

There is one watercourse within the corridor segment: Mt. Joy Creek (same crossing as SV-5). Mt. Joy Creek is conveyed under the corridor by a culvert.

3.6.1.6.3 Species at Risk

Three species have the potential to occur within the study area: Monarch, Nine-spotted Lady Beetle, and Chimney Swift.

3.6.1.6.4 Significant Wildlife Habitat

No SWH candidate or confirmed areas were identified within this section of the Project study area during previous TPAP studies. An evaluation completed in 2019 (NT&F Natural Environment Baseline Conditions Report, Gannett Fleming [2020]) determined SWH is limited with candidate habitats occurring in association with Mount Joy Creek. Candidate habitats in addition to bat roosts may include: Turtles Nesting Habitat and Amphibian Breeding Habitat (Wetlands).

3.6.1.6.5 Designated Areas

This portion of the study area is located within the jurisdiction of TRCA and Aurora District MNRF. Portions of this study area are within the Greenbelt Urban River Valley.

3.6.1.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.2 Preliminary Environmental Site Assessment

A Preliminary Environmental Site Assessment (refer to **Appendix B**) was prepared for new layover facilities, which details the baseline conditions within the additional study area. Details on the assessment additional OCS infrastructure along the corridor is provided below, where applicable.

3.6.2.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.2.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.2.3 OCS: Section SV-3 – Milliken Station to Unionville Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

3.6.2.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

A Preliminary ESA was completed for the Unionville Storage Yard site. No APEC were identified at the subject property. The PCA identified at the subject property and within the 250 m buffer study area were not deemed to pose an environmental concern to the subject property (see **Appendix B – Attachment #1**).

A Phase II ESA was also completed as part of a separate undertaking within the same study area in 2015 and found no evidence of soil or groundwater contamination.

3.6.2.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

3.6.2.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

3.6.2.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.3 Built Heritage Resources and Cultural Heritage Landscapes

Please refer to **Appendix C1** for a description of methodology followed for identification of potential cultural heritage resources within the additional study area.

3.6.3.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.3.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.3.3 OCS: Section SV-3 – Milliken Station to Unionville Station

No Built Heritage Resources (BHRs) or Cultural Heritage Landscapes (CHLs) are located within the EPR Addendum study area.

3.6.3.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

No BHRs or CHLs are located with the rail corridor or the 30m buffer.

3.6.3.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

No BHRs or CHLs are located with the rail corridor or the 30m buffer.

3.6.3.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

No BHRs or CHLs are located with the rail corridor or the 30m buffer.

3.6.3.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.4 Archaeology

A review of the historic land use of the Stouffville corridor indicates that it has been occupied by Indigenous peoples for thousands of years. It is situated within the traditional territory occupied by the ancestral Huron-Wendat; however, the north shore of Lake Ontario was abandoned around the turn of the sixteenth century. The corridor was subsequently utilized by the Seneca First Nation for hunting until the late seventeenth century; and, subsequently occupied by Ojibwa First Nations until 1805 (Benn 2008; Ellis 2013; Williamson 2013).

The background research also acknowledges that since the turn of the eighteenth century, the Métis have lived throughout the Province of Ontario but are often muted in the historical record (MNC n.d.; Stone and Chaput 1978: 607,608). Since 1805, the corridor has been occupied by Euro-Canadian peoples and is situated within the former Townships of Markham, Scarborough and Whitchurch, County of York (Miles & Co. 1878). A review of 19th century mapping indicates that the corridor includes both historic features and transportation routes (Miles & Co. 1878; Tremaine 1860).

Please see **Appendix D** for a copy of the Archaeological Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.6.4.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.4.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.4.3 OCS: Section SV-3 – Milliken Station to Unionville Station

Section SV-3 meets the following criteria which are indicative of archaeological potential:

- Proximity to Euro-Canadian settlement (Hagerman's Corners, Milliken);
- Proximity to historic transportation route (14th Avenue, Kennedy Road, Toronto, Nipissing Railway);
- Proximity to historic features (farmsteads);
- Well-drained sandy soil (Woburn loam);
- Proximity to previously registered archaeological sites (see **Table 3-35**); and
- Proximity to water source (Rouge River).

Segments within this study area are located in Borden block *AlGt*. According to the OASD (MHSTCI 2019), seven previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres of the study area. Site details are presented below in **Table 3-35**.

TABLE 3-35: SECTION SV-3 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGt-211	CNR Uxbridge 2	Euro-Canadian	Midden	CRMG 1995
AlGt-235	CNR Uxbridge 3	Euro-Canadian	Homestead	CRMG 1995
AlGt-262	n/a	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-264	n/a	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-265	n/a	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-266	n/a	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-267	H1	Euro-Canadian	Homestead	ASI 2000

This section has been subject to six previous archaeological assessments:

- (ASI 2002) Stage 1 and 2 Archaeological Resource Assessment of Proposed Markham Centre Development Part of Lots 8 and 9, Concession 5 Town of Markham, Regional Municipality of York, Ontario 2000-016-043, 2001-020-038
- (ASI 2003) Stage 1 Archaeological Assessment Hagerman Grade Separation, Town of Markham, (Former Markham Township, York County), Regional Municipality of York, Ontario 2001-020-286
- (ASI 2008) Stage 1 Archaeological Assessment 407 Transitway, From Highway 400 to Kennedy Road, Regional Municipality of York, Ontario P057-348-2007, P057-502-2008
- (ASI 2011b) Stage 2 Archaeological Assessment (Property Assessment) VIVA NEXT H3 Detailed Design: Highway 7 Corridor from Bayview Avenue to Warden Avenue, Public Transit and Associated Road Improvements, Regional Municipality of York, Ontario P264-115-2010
- (ASI 2011c) Stage 1 and 2 Archaeological Assessment of the Markham Centre Development Corporation Property, Enterprise Boulevard, West of Kennedy Road Part of Lots 8 and 9, Concession 5 Geographic Township of Markham, County of York, now the Town of Markham, Regional Municipality of York P347-018-2011
- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016

These criteria are indicative of the study area as having potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.6.4.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

Section SV-4 meets the following criteria which are indicative of archeological potential:

- Proximity to Euro-Canadian settlement (Hagerman's Corners, Markham, Unionville);
- Proximity to historic transportation route (14th Avenue, Kennedy Road, Toronto & Nipissing Railway);
- Proximity to historic features (farmsteads);

- Well-drained sandy soil (Woburn loam);
- Proximity to previously registered archaeological sites (see **Table 3-36**); and
- Proximity to water source (Rouge River).

Segments within this study area located in Borden block *AlGt*. According to the OASD (MHSTCI 2019), eight previously registered archaeological sites are located within one kilometre of the study area, none of which are within 50 metres. Site details are presented below in **Table 3-36**.

TABLE 3-36: SECTION SV-4 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGt-211	CNR Uxbridge 2	Euro-Canadian	Midden	CRMG 1995
AlGt-235	CNR Uxbridge 3	Euro-Canadian	Homestead	CRMG 1995
AlGt-262	n/a	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-263	n/a	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-264	n/a	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-265	n/a	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-266	n/a	Pre-Contact Indigenous	Findspot	ASI 2000
AlGt-267	H1	Euro-Canadian	Homestead, Privy	ASI 2000

This section has been subject to six previous archaeological assessments:

- (ASI 2002) Stage 1 and 2 Archaeological Resource Assessment of Proposed Markham Centre Development Part of Lots 8 and 9, Concession 5 Town of Markham, Regional Municipality of York, Ontario 2000-016-043, 2001-020-038
- (ASI 2003) Stage 1 Archaeological Assessment Hagerman Grade Separation, Town of Markham, (Former Markham Township, York County), Regional Municipality of York, Ontario 2001-020-286
- (ASI 2008) Stage 1 Archaeological Assessment 407 Transitway, From Highway 400 to Kennedy Road, Regional Municipality of York, Ontario P057-348-2007, P057-502-2008
- (ASI 2011b) Stage 2 Archaeological Assessment (Property Assessment) VIVA NEXT H3 Detailed Design: Highway 7 Corridor from Bayview Avenue to Warden Avenue, Public Transit and Associated Road Improvements, Regional Municipality of York, Ontario P264-115-2010
- (ASI 2011c) Stage 1 and 2 Archaeological Assessment of the Markham Centre Development Corporation Property, Enterprise Boulevard, West of Kennedy Road Part of Lots 8 and 9, Concession 5 Geographic Township of Markham, County of York, now the Town of Markham, Regional Municipality of York P347-018-2011
- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016

These criteria are indicative of potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.6.4.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

Section SV-5 meets the following criteria which are indicative of archaeological potential:

- Proximity to Euro-Canadian settlement (Markham, Mountjoy);
- Proximity to historic transportation route (Markham Road; Toronto & Nipissing Railway, 16th Avenue, Markham Road.);
- Proximity to historic features (farmsteads);
- Well-drained sandy soil
- Proximity to previously registered archaeological sites (see **Table 3-37**); and
- Proximity to water source (Rouge River).

Segments within this study area are located in Borden block *AlGt*. According to the OASD (MHSTCI 2019), 13 previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in **Table 3-37**.

TABLE 3-37: SECTION SV-5 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGt-163	Strickler	Euro-Canadian	Homestead Farmstead Privy	HH 1987
AlGt-209	James Hawkins	Euro-Canadian	Homestead	MTO 1992
AlGt-210	Swan Lake	Archaic, Early	Findspot	ASI 1994
AlGt-231	Wismer Commons 7	Pre-Contact Indigenous	Findspot	Robert Pearce 1996
AlGt-232	Wismer Commons 8	Euro-Canadian	Unknown	Robert Pearce 1996
AlGt-254	Clendenen	Euro-Canadian	Homestead	ASI 1999
AlGt-256	n/a	Archaic, Middle	Findspot	ASI 1999
AlGt-257	n/a	Pre-Contact Indigenous	Findspot	ASI 1999
AlGt-258	n/a	Pre-Contact Indigenous	Findspot	ASI 1999
AlGt-259	n/a	Pre-Contact Indigenous	Findspot	ASI 2000b
AlGt-538	Markham Pottery Site	Euro-Canadian	Manufacturing	ASI 1880, 2009, 2012, 2013

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
			Midden Workshop	
AlGt-604	Farley	Euro-Canadian	Homestead	ASI 2012
AlGt-630	Clarry West Site	Euro-Canadian	Farmstead	TLAI 2017

This section has been subject to four previous archaeological assessments:

- (ASI 2000) Stage 1-2 Archaeological Resource Assessment of Greensborough Secondary Planning Area, Town of Markham, Regional Municipality of York, Ontario 99-007-056
- (ASI 2007d) Stage 1 Archaeological Assessment 16th Avenue from McCowan Road to the York-Durham Line Class Environmental Assessment, Regional Municipality of York, Ontario P057-308-2006
- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016
- (ASI 2017g) Stage 1 Archaeological Assessment 16th Avenue Yonge Street to Woodbine Avenue Part of Lots 15, 16, 40 and 41, Concessions 1-3 East of Yonge Street (Former Township of Markham, County of York)

These criteria are indicative of the study area as having potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.6.4.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

Section SV-6 meets the following criteria which are indicative of archaeological potential:

- Proximity to Euro-Canadian settlement (Markham, Stouffville, Mount Joy);
- Proximity to historic transportation route (16th Avenue, Markham Road, Toronto & Nipissing Railway);
- Proximity to historic features (farmsteads);
- Well-drained sandy soil
- Proximity to previously registered archaeological sites (see **Table 3-38**); and
- Proximity to water source (Rouge River).

Segments within this study area are located in Borden block *AlGt*. According to the OASD (MHSTCI 2019), 12 previously registered archaeological sites are located within one kilometre of the study area, one of which, AlGt-259, is located within 50 metres. Site details are presented in **Table 3-38**.

TABLE 3-38: SECTION SV-6 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGt-163	Strickler	Euro-Canadian	Homestead Farmstead Privy	HH 1987
AlGt-209	James Hawkins	Euro-Canadian	Homestead	MTO 1992
AlGt-210	Swan Lake	Archaic, Early	Findspot	ASI 1994
AlGt-231	Wismer Commons 7	Pre-Contact Indigenous	Findspot	Robert Pearce 1996
AlGt-254	Clendenen	Euro-Canadian	Homestead	ASI 1999
AlGt-256	n/a	Archaic, Middle	Findspot	ASI 1999
AlGt-257	n/a	Pre-Contact Indigenous	Findspot	ASI 1999
AlGt-258	n/a	Pre-Contact Indigenous	Findspot	ASI 1999
AlGt-259	*n/a*	*Pre-Contact Indigenous*	*Findspot*	*ASI 2000b*
AlGt-538	Markham Pottery Site	Euro-Canadian	Manufacturing Midden Workshop	ASI 1880, 2009, 2012, 2013
AlGt-604	Farley	Euro-Canadian	Homestead	ASI 2012
AlGt-630	Clarry West Site	Euro-Canadian	Farmstead	TLAI 2017

Note: Sites in *italics* are within 50 m of the study area.

- Site AlGt-259 was an isolated findspot identified as a celt blank. Its location is simply at 16th Avenue and 9th Line. According to the background research, four previous ASI reports detail fieldwork within 50 m of the Segment ST-6 study area.

This section has been subject to four previous archaeological assessments:

- (ASI 2000) Stage 1-2 Archaeological Resource Assessment of Greensborough Secondary Planning Area, Town of Markham, Regional Municipality of York, Ontario 99-007-056
- (ASI 2007d) Stage 1 Archaeological Assessment 16th Avenue from McCowan Road to the York-Durham Line Class Environmental Assessment, Regional Municipality of York, Ontario P057-308-2006
- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016

- (ASI 2017g) Stage 1 Archaeological Assessment 16th Avenue Yonge Street to Woodbine Avenue Part of Lots 15, 16, 40 and 41, Concessions 1-3 East of Yonge Street (Former Township of Markham, County of York) Town

These criteria are indicative of the study area as having potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.6.4.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.5 Land Use and Socio-Economic

Please see **Appendix E** for a copy of the Land Use and Socio-Economic Addendum Report, which details the baseline conditions assessment completed for this discipline.

3.6.5.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.5.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.5.3 OCS: Section SV-3 – Milliken Station to Unionville Station

3.6.5.3.1 Existing Land Use

From Milliken GO Station to Unionville GO Station, lands are predominantly *industrial* with minor sections of *Residential* and *Parkway Belt West* and *Utility* lands surrounding Highway 407. Undeveloped lands are located east of the rail corridor on both sides of Kennedy Road; west of the corridor north of 14th Avenue, and on both sides of the rail corridor around Highway 407. Official Plan Land use designations along this section of the rail corridor are shown in **Figures SV-18 to SV-19** in **Appendix E**.

Milliken Mills Park is located on the eastern side of the rail corridor just south of 14th Avenue, and there are no sensitive receptor facilities within 40 metres of the rail corridor.

Hangerman Diamond Lift Station is located within 30 metres of this segment of the rail corridor. Cycling routes include paths along 14th Avenue and within the underdeveloped residential lands to the north. In addition, an at-grade, multi-use pathway is located just north of 14th Avenue.

There are no hospitals, schools, places of worship, child-care centres or long-term care centres in the vicinity of the rail corridor.

3.6.5.3.2 Planned Land Use

Beginning at Milliken GO Station, the rail corridor passes through the Milliken Centre Secondary Plan. The purpose of this plan is to establish a Local Urban Centre in the Milliken area that supports transit through an intensified, *Mixed Use* environment. Land uses include *Residential* of varying densities, *Commercial Mixed Use* buildings, *Public* and *Park Uses*, and an elementary school. The corridor also traverses the Heritage Centre Markham Village Heritage Conservation District and the Heritage Centre - Unionville Heritage Conservation District.

Undeveloped lands along this section of the rail corridor have the following designations: *Residential Low Rise* at Kennedy Road; *General Employment* at 14th Avenue; and *Parkway Belt West* and *Mixed Use Office Priority* at Highway 407.

There are no planned and approved recreational amenities bordering this section of the rail corridor, and this section of the rail corridor is zoned *Transportation and Utilities* within the City of Markham.

3.6.5.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

3.6.5.4.1 Existing Land Use

North of the Unionville GO Station, the rail corridor passes through *Mixed Use Low-rise*, *Greenway*, *Mixed Use High-rise* and *Mixed Use Office Priority* lands towards the Centennial GO Station. The rail corridor also passes through *Mixed Use Heritage Main Street* and *Residential Low Rise* designations within the Unionville Heritage Conservation District Area. The Unionville Heritage Conservation District Area encompasses lands along Main Street Unionville. East of Centennial GO Station, land south of the rail corridor is *Mixed Use Mid-rise* which then transitions to *Service Employment* closer to the Markham GO Station. On the northern side of the rail corridor, lands are almost entirely comprised of *Low-rise Residential* with one section of *Greenway* at Cedar Valley Park. Undeveloped vacant lands are located west of the rail corridor to the north of Enterprise Boulevard and south of the rail corridor near Graham Crescent. Official Plan Land use designations along this section of the rail corridor are shown in **Figures SV-19 to SV-20** in **Appendix E**.

There are three large parks in this section of the rail corridor: Quantztown Park, Markham Centennial Park, and Cedar Valley Park. Based on currently available information, Markham trails within in the vicinity of this section of the rail corridor include a part of the Unionville Valleylands Trail System. This trail crosses the rail corridor west of Kennedy Road. Bill Crothers S.S. Park is located on the eastern edge of the rail corridor, west of Kennedy Road. A pathway also runs along Enterprise Boulevard, crossing under the rail corridor.

There are no hospitals, schools, places of worship, child-care centres or long-term care centres in the vicinity of the rail corridor.

3.6.5.4.2 Planned Land Use

This section of the rail corridor passes through two Secondary Plan areas: the Markville Secondary Plan and the Markham Centre Secondary Plan. The Unionville Heritage Conservation District Area and the Markham Village Heritage Conservation District Area encompass lands along Main Street Unionville. The general purpose of these plans is to promote a vibrant mixed use environment that is characterized by high-density residential use, and protect existing heritage uses and a range of commercial uses. Undeveloped lands are designated *Mixed Use High Rise* at Enterprise Drive and *Service Employment* near Graham Crescent.

There are no planned and approved recreational amenities bordering this section of the rail corridor, and the rail corridor is zoned *Transportation and Utilities* within the City of Markham.

3.6.5.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

3.6.5.5.1 Existing Land Use

North of Markham GO Station, the rail corridor passes through *Greenway*, *Mixed Use Low Rise* and Residential Low Rise before reaching 16th Avenue. At the Mount Joy GO Station, land surrounding the rail corridor is designated as a combination of *Mixed Use Mid Rise* and *Mixed Use High Rise*. Official Plan Land use designations along this section of the rail corridor are shown in **Figures SV-25 to SV-26** in **Appendix E**.

The Mount Joy Community Centre and Park are located directly west of the rail corridor. The park comprises Exhibition Creek, Mount Joy Lake and a trail around the lake that leads to the sports field. Two child-care centres and one community centre are located within 100 metres of the rail corridor. They include the Markham Montessori, Little Readers Academy and the Mount Joy Community Centre. This section also includes a pathway that traverses Exhibition Creek.

3.6.5.5.2 Planned Land Use

This section of the rail corridor falls within the Berczy Village/Wismer Commons/Sawn Lake/ Greensborough site specific policy area and passes through the Markham Road Corridor-Mount Joy Secondary Plan. The general purpose of this plan is to promote a vibrant mixed use environment that is characterized by a range of residential uses and a significant concentration of employment and commercial uses. A major focus of this plan is to retain and promote existing heritage features of the rail corridor. The rail corridor follows through the Heritage Centre Markham Village Heritage Conservation District. A planned cycling route would be located along 16th Avenue and Highway 48/Markham Road, per Markham's Pathway and Trails Master Plan.

3.6.5.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

3.6.5.6.1 Existing Land Use

The rail corridor passes through *Greenway* and *Mixed Use Low Rise* prior to 16th Avenue. At the Mount Joy GO Station, land surrounding the rail corridor is designated as both *Mixed Use Mid Rise* and *Mixed Use High Rise*. A large swath of undeveloped land is located east of the rail corridor across from the Mount Joy GO Station.

South of the Markham-Stouffville border to the Stouffville GO Station, land use is characterized by *Greenland Area, Residential Area*, and *Existing Residential Area* lands. Approaching the Stouffville GO Station, it transitions into the *Community Core Area*. The corridor comprises a variety of land uses including *Core Area – Main Street*, *Core Area – Mixed Use*, and *Greenland Area*. Some undeveloped land is located west of the rail corridor south of Major Mackenzie Drive East.

This segment of the rail corridor passes through Rouge National Urban Park. The park aims to support the priorities of the Government of Canada's National Conservation Plan. There are no sensitive receptors within 40 metres of the rail corridor.

3.6.5.6.2 Planned Land Use

The rail corridor continues through the Heritage Centre Markham Village Heritage Conservation District, Markham Road Corridor-Mount Joy Secondary Plan up to Major Mackenzie Drive, passing through the Community of Stouffville Secondary Plan area.

Undeveloped lands at the Mount Joy GO Station (part of the Markham Road Corridor-Mount Joy Secondary Plan) are designated *Mixed Use High Rise*. Those at Major Mackenzie Drive East are designated *Mixed Use Mid Rise.*

There are no planned and approved recreational amenities bordering this section of the rail corridor. A number of enhancements are proposed within the northern segment of the Rouge National Urban Park, including a welcome area at the corner of 19th Avenue and 9th Line at Rouge Beach, under the Parks Canada 2014 draft Management Plan. The rail corridor is zoned *Transportation and Utilities* in the City of Markham. Under the Town of Whitchurch Stouffville Zoning By-law 2010-001-ZO the rail corridor does not have any zoning designation.

3.6.5.7 OCS: Section SV-7 – Stouffville Station to LincoInville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.6 Air Quality

Since 2017, Metrolinx has made significant changes to the planned rail infrastructure and train service for the GO Expansion Program, of which Electrification forms a part. The potential air quality impacts of trains and associated equipment and infrastructure have been assessed at both the regional scale, and locally in those segments of the corridors which are expected to experience an increase in diesel (i.e. non-electrified) powered equipment activity relative to the 2015 (pre-project or baseline) levels and which have sensitive receptors exposed to the rail corridor. While diesel service levels will remain the same or decrease (with electric train service taking up the planned increased service levels), there will be an increase in the number of diesel locomotives operating on some corridors. This is due to the need to power diesel trains with two locomotives rather than one during peak periods.

On the SV Corridor, increased service levels will be achieved by adding electrified trains and diesel train traffic levels will either remain the same or decrease in future. As such, an assessment of local air quality impacts was not undertaken.

A description of regional air quality baseline conditions is included in Section 4.8.7, and the Regional Air Quality Study (refer to **Appendix F**) details baseline conditions within the project area.

3.6.7 Noise and Vibration

The noise and vibration baseline conditions within the additional study area for this discipline are detailed in **Appendix G5**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.5.

The SV Corridor Study Area begins at St. Clair Avenue East (in Toronto, approximately 100 m north of the Scarborough GO station) and ends at the Lincolnville GO station, approximately 35 kilometres in length. The Study Area is shown in **Figure 3-23**.

Noise receptors for this assessment include the following sensitive land uses:

- Residences;
- Hotels, motels and campgrounds;
- Schools, universities, libraries and daycare centres;
- Hospitals and clinics, nursing / retirement homes;
- Churches and places of worship;
- Planned residential developments with approved building permits from the Municipality; and
- Vacant lots that are currently zoned for residential use.

Noise receptors within the Study Area are mainly residential houses located adjacent to the SV Rail Corridor. However, there is a section of rural land between Mount Joy GO and Stouffville GO Stations. In general, areas of receptors were identified using publicly available address point databases or through visual identification using publicly available satellite aerial images.

In the 2017 EPR, vacant lots were only assessed for residential developments with approved building permits. In this addendum, all vacant lots that are zoned for residential use (with or without building permits) were included in the assessment. All vacant residential lots within the Study Area were considered.

Representative noise receptors were chosen to simplify the presentation of results for a much larger number of receptors assessed. The representative noise receptors are summarized in **Table 3-39** to **Table 3-41**. Complete mapping of noise receptors is included in **Appendix G.**

For the assessment of vibration, the proximity of all noise receptors within the SV Corridor to changes in track alignment or special trackwork was assessed. The following areas were identified as areas of investigation for operational vibration:

- 1.2 km of new track at Unionville GO Station;
- 1.2 km of new track at Mount Joy GO Station; and
- 16 new switches along the SV Corridor.

Receptors for vibration include the same sensitive land uses as described in the noise assessment. However, future development locations that did not have approval for residential uses were not included since they would need to be designed to achieve appropriate vibration levels with the future rail infrastructure in place. The point of evaluation is defined as 5 to 10 m from the building foundation in a direction parallel to the tracks.

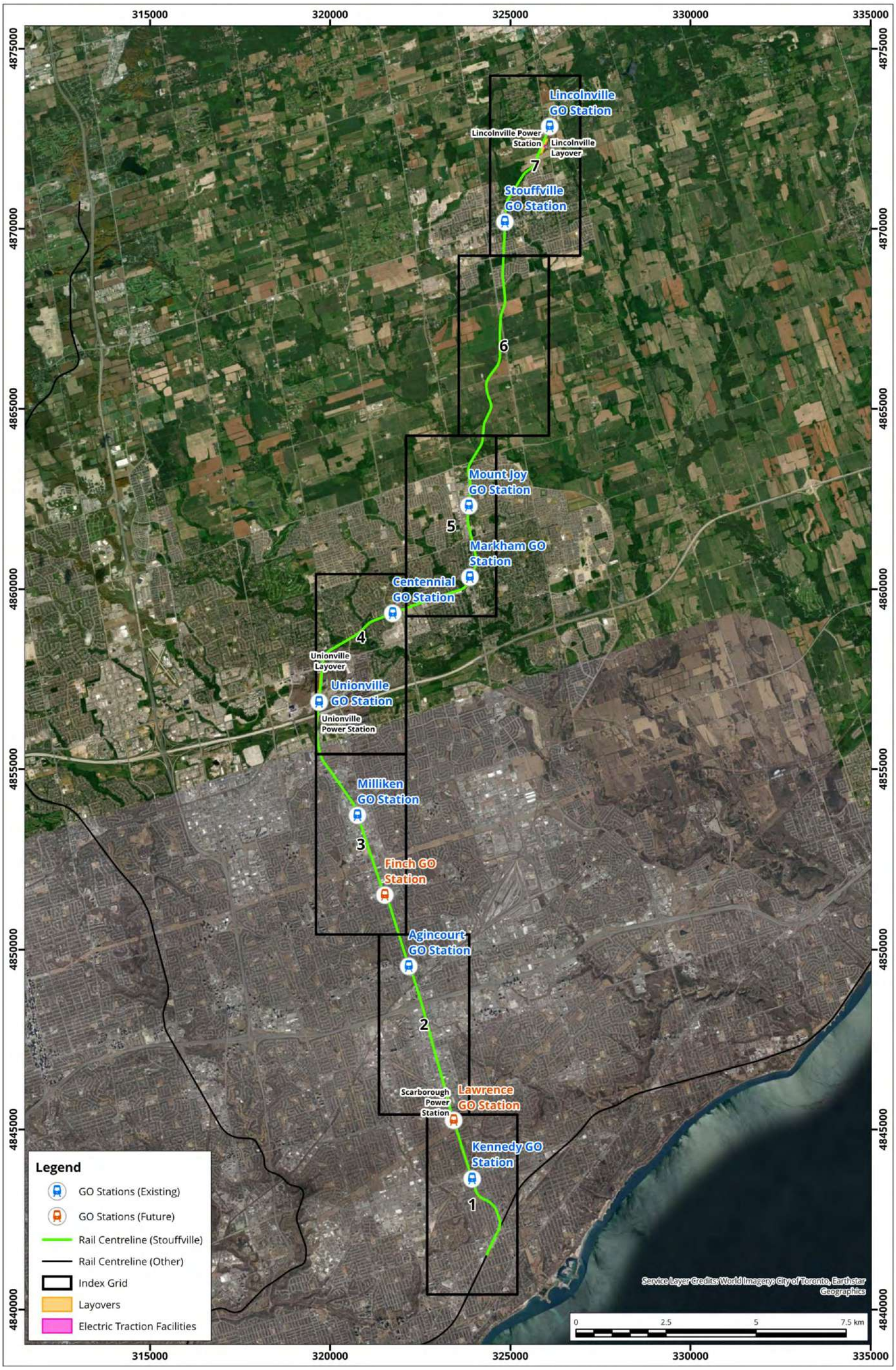

FIGURE 3-23: STOUFFVILLE NOISE & VIBRATION STUDY AREA

TABLE 3-39: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS - DANFORTH GO TO FINCH AVENUE GO

Track Section	Receptor ID[1]	Figure[58]	Description	Receptor Distance from Nearest Track (m)
Danforth GO to Kennedy GO	R001	D.1.1	Single Detached Dwelling	90
	R002	D.1.1	Single Detached Dwelling	20
	R003	D.1.1	Single Detached Dwelling	30
	R004	D.1.1	Single Detached Dwelling	10
	R005	D.1.1	Single Detached Dwelling	20
	R006	D.1.1	Single Detached Dwelling	30
	R007	D.1.1	Single Detached Dwelling	20
Kennedy GO to Lawrence Ave GO	R008	D.1.1	Single Detached Dwelling	80
	R009	D.1.1	Single Detached Dwelling	10
	R010	D.1.1	Single Detached Dwelling	80
	R011	D.1.1	Single Detached Dwelling	10
	R012	D.1.1	Single Detached Dwelling	30
Lawrence Ave GO to Agincourt GO	R013	D.1.1	Condominium	40
	R014	D.1.1	Condominium	50
	R015	D.1.2	Single Detached Dwelling	440
	R016	D.1.2	Single Detached Dwelling	430
	R017	D.1.2	Single Detached Dwelling	470
	R018	D.1.2	Single Detached Dwelling	450
	R019	D.1.2	Single Detached Dwelling	470
	R020	D.1.2	Single Detached Dwelling	450
	R021	D.1.2	Single Detached Dwelling	30
	R022	D.1.2	Single Detached Dwelling	50
	R023	D.1.2	Single Detached Dwelling	450
	R024	D.1.2	Single Detached Dwelling	30
	R025	D.1.2	Townhouse	40
Agincourt GO to Finch Ave GO	R026	D.1.2	Townhouse	60
	R027	D.1.2	Condominium	70
	R028	D.1.2	Condominium	50
	R029	D.1.2	Single Detached Dwelling	20
	R030	D.1.2	Single Detached Dwelling	30
	R031	D.1.2	Single Detached Dwelling	50
	R032	D.1.3	Single Detached Dwelling	50
	R033	D.1.3	Single Detached Dwelling	40

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

[58] Figures referenced are included in **Appendix G5.**

TABLE 3-40: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS - FINCH AVENUE GO TO MOUNT JOY GO

Track Section	Receptor ID[1]	Figure[59]	Description	Receptor Distance from Nearest Track (m)
Finch Ave GO to Milliken GO	R034	D.1.3	Single Detached Dwelling	500
	R035	D.1.3	Single Detached Dwelling	460
	R036	D.1.3	Single Detached Dwelling	440
	R037	D.1.3	Townhouse	460
	R038	D.1.3	Townhouse	450
Milliken GO to Unionville GO	R039	D.1.3	Single Detached Dwelling	450
	R040	D.1.3	Single Detached Dwelling	440
	R041	D.1.3	Townhouse	370
	R042	D.1.3	Townhouse	50
	R043	D.1.3	Condominium	40
	R044	D.1.3	Condominium	30
	R045	D.1.3	Single Detached Dwelling	30
	R046	D.1.4	Single Detached Dwelling	860
Unionville GO to Centennial GO	R047	D.1.4	Single Detached Dwelling	30
	R048	D.1.4	Single Detached Dwelling	180
	R049	D.1.4	Condominium	20
	R050	D.1.4	Condominium	40
	R051	D.1.4	Single Detached Dwelling	20
	R052	D.1.4	Single Detached Dwelling	30
	R053	D.1.4	Single Detached Dwelling	30
	R054	D.1.4	Single Detached Dwelling	40
	R055	D.1.4	Single Detached Dwelling	20
Centennial GO to Markham GO	R056	D.1.4	Single Detached Dwelling	40
	R057	D.1.5	Single Detached Dwelling	210
	R058	D.1.5	Single Detached Dwelling	10
	R059	D.1.5	Single Detached Dwelling	140
	R060	D.1.5	Single Detached Dwelling	10
Markham GO to Mount Joy GO	R061	D.1.5	Single Detached Dwelling	40
	R062	D.1.5	Single Detached Dwelling	40
	R063	D.1.5	Single Detached Dwelling	30
	R064	D.1.5	Single Detached Dwelling	60
	R065	D.1.5	Single Detached Dwelling	50
	R066	D.1.5	Single Detached Dwelling	20
	R067	D.1.5	Single Detached Dwelling	30
	R068	D.1.5	Single Detached Dwelling	370

[59] Figures referenced are included in **Appendix G5.**

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

TABLE 3-41: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS - MOUNT JOY GO TO LINCOLNVILLE GO

Track Section	Receptor ID[1]	Figure[60]	Description	Receptor Distance from Nearest Track (m)
Mount Joy GO to Stouffville GO	R069	D.1.5	Single Detached Dwelling	300
	R070	D.1.5	Single Detached Dwelling	60
	R071	D.1.5	Single Detached Dwelling	60
	R072	D.1.5	Single Detached Dwelling	260
	R073	D.1.5	Single Detached Dwelling	290
	R074	D.1.6	Single Detached Dwelling	180
	R075	D.1.6	Single Detached Dwelling	60
	R076	D.1.6	Single Detached Dwelling	150
	R077	D.1.6	Single Detached Dwelling	510
	R078	D.1.6	Single Detached Dwelling	130
	R079	D.1.6	Single Detached Dwelling	60
	R080	D.1.6	Single Detached Dwelling	520
	R081	D.1.6	Single Detached Dwelling	70
	R082	D.1.6	Single Detached Dwelling	340
	R083	D.1.6	Townhouse	40
	R084	D.1.6	Townhouse	60
	R085	D.1.6	Townhouse	50
	R086	D.1.6	Townhouse	50
	R087	D.1.6	Single Detached Dwelling	50
	R088	D.1.7	Single Detached Dwelling	50
	R089	D.1.7	Single Detached Dwelling	50
	R090	D.1.7	Single Detached Dwelling	30
	R091	D.1.7	Single Detached Dwelling	50
Stouffville GO to Lincolnville GO	R092	D.1.7	Single Detached Dwelling	200
	R093	D.1.7	Single Detached Dwelling	130
	R094	D.1.7	Single Detached Dwelling	70
	R095	D.1.7	Single Detached Dwelling	100
	R096	D.1.7	Single Detached Dwelling	30
	R097	D.1.7	Single Detached Dwelling	80
	R098	D.1.7	Single Detached Dwelling	100
	R099	D.1.7	Single Detached Dwelling	150

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

[60] Figures referenced are included in **Appendix G5.**

Existing noise barriers are defined as barriers built as of August 2019 or planned barriers identified during Environmental Assessments completed prior to August 2019. Existing barriers in some cases include barriers triggered by the 2017 Electrification EPR. Existing barriers were included in the Pre-project, and Post-project modelling scenarios. The replacement of existing or planned noise barriers located on the Metrolinx Right-of-Way was not considered in this assessment. Mitigation was therefore not investigated in locations with existing or planned barriers. However, filling in of gaps between existing noise barriers and horizontal extensions of these barriers were investigated, subject to technical and economic feasibility.

3.6.8 Visual

Please see **Appendix H** for a copy of the Visual Assessment Report, which details the baseline conditions assessment completed for this discipline.

A detailed description of the methodology used to classify areas of potential visual impact can be found in **Section 3.3.8.**

3.6.8.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.8.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.8.3 OCS: Section SV-3 – Milliken Station to Unionville Station

This segment is located north of the Unionville GO Station between Enterprise Boulevard and south of Highway 7 in the City of Markham. Land uses abutting the rail corridor are primarily *Mixed Use*, *Employment* or *Natural Area*, with no visual sensitivity related to the new proposed infrastructure.

However, north of Highway 7, the character of the rail corridor is comprised primarily of residential developments interspersed with parks abutting the rail ROW. Some homes back up to the track while in other areas, the homes front the track facing a local street that closely parallels the corridor. Unionville is the site of the original train station on Main Street, with an at-grade crossing adjacent to the station building. Main Street is the gateway to the scenic Unionville town centre and Unionville Heritage Conservation District (see **Figure 3-24**).

FIGURE 3-24: UNIONVILLE CANADIAN NATIONAL RAILWAY STATION

Although, the proposed Unionville Storage Yard is located further south (from Enterprise Boulevard to south of Highway 7), the area is still considered highly sensitive. The proposed storage facility has the potential of disturbing the existing views within this area; thus, the baseline conditions are classified as *High*.

The next segment extends from Enterprise Drive to the south of the Highway 407 Express Toll Road, passing by Unionville GO Station. A new track and island platform have been proposed along the Unionville GO Station. The upgrades are proposed to occur within the existing ROW; however, a section of the new infrastructure may impact the existing GO Station parking lot.

South of the Unionville GO Station, additional OCS infrastructure is proposed to occur within the existing ROW. The surrounding area is comprised primarily of *Employment/Industrial* uses. The proposed track infrastructure suggests minimal changes to the views in this area, thus existing visual baseline conditions are classified as *Negligible.*

Refer to **Figures SV-18 and SV-19** in **Appendix E**.

3.6.8.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

Refer to 3.6.8.3 of this report.

3.6.8.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

Also located within Markham, this section comprises *Industrial* developments north of 16th Avenue on the east side of the rail ROW. The west side of the rail ROW includes residential development approximately 30 metres from the rail ROW, as well as Mount Joy Lake Park.

Between the Mount Joy GO Station at Bur Oak Avenue and Major MacKenzie Drive, there is an industrial development on the east side of the track and residential development on the west side, where the sides and fronts of homes face the rail ROW. The proposed side platform and track upgrades are proposed to be built within the existing Metrolinx rail ROW (see **Figure 3-25** and **Figure 3-26**). Based on the proposed infrastructure in this segment, the existing visual baseline conditions are classified as *Negligible*.

FIGURE 3-25: AERIAL VIEW OF PROPOSED INFRASTRUCTURE NEAR MOUNT JOY GO STATION (LOOKING EAST)[61]

FIGURE 3-26: RESIDENTIAL DEVELOPMENT NEAR MOUNT JOY GO STATION (LOOKING EAST)[62]

[61] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange.
[62] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange.

3.6.8.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

Refer to section 3.6.8.5 of this report.

3.6.8.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.9 Utilities

Please see **Appendix I** for a copy of the Utilities Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.6.9.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.9.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.9.3 OCS: Section SV-3 – Milliken Station to Unionville Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

3.6.9.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

Refer to **Figure ST-3** in **Appendix I**. The following utilities have been identified within the study area.

TABLE 3-42: SECTION SV-4 IDENTIFIED UTILITIES

UID	Site Names	Mile Start	Mile End	Owner Name	Nearest Street	Utility Class	Description	Size	Material
50930	Stouffville	50.66	50.63	City of Markham	Enterprise Boulevard	UG - Parallel	Storm	300mm	Concrete
51036	Stouffville	50.79	50.79	Unknown	South of Enterprise Boulevard	UG - Parallel	Culvert	500mm	Other
51035	Stouffville; Unionville PS	51.00	51.00	Unknown	South of Highway 407	UG - Parallel	Culvert	700mm	Other
50090	Stouffville	50.67		York Region	Enterprise Boulevard	UG - Crossing	Sewer	2100mm	Concrete
50655	Stouffville	50.65		Bell	Enterprise Boulevard	UG - Crossing	Communication Conduit	2 conduits	Plastic

UID	Site Names	Mile Start	Mile End	Owner Name	Nearest Street	Utility Class	Description	Size	Material
50656	Stouffville	50.63		Bell	Enterprise Boulevard	UG - Crossing	Communication Conduit	1 conduit	Plastic
50723	Stouffville	50.63		City of Markham	Enterprise Boulevard	UG - Crossing	Storm	825mm	Unknown
50724	Stouffville	50.64		City of Markham	Enterprise Boulevard	UG - Crossing	Water	900mm	Concrete
50843	Stouffville	50.65		York Telecom Network	Enterprise Boulevard	UG - Crossing	Communication Conduit	115mm	Metallic Encasing
50844	Stouffville	50.63		York Telecom Network	Enterprise Boulevard	UG - Crossing	Communication Conduit	115mm	Metallic Encasing
52153	Stouffville	50.65		Rogers	Enterprise Boulevard	UG - Crossing	Communication Conduit	100mm conduit	Fiber-Optic
50659	Stouffville	50.13		Bell	Highway 7	UG - Crossing	Communication Duct Bank	23 ducts	Concrete
50731	Stouffville	50.11		York Region	Highway 7	UG - Crossing	Storm	36"	Unknown
50749	Stouffville	50.13		City of Markham	Highway 7	UG - Crossing	Water	24"	Metallic Encasing
50765	Stouffville	50.15		City of Markham	Highway 7	UG - Crossing	Sewer	1350mm	Metallic Encasing
50769	Stouffville	50.18		City of Markham	East Drive	UG - Crossing	Sewer	600mm	Metallic Encasing
50772	Stouffville	50.11		Alectra (Powerstream)	Highway 7	OH - Crossing	Conductor	27.6kV	Metallic
50781	Stouffville	50.11		Rogers	Highway 7	OH - Crossing	Cable	Unknown	Plastic
50783	Stouffville	50.04		Rogers	Pavillion Street	UG - Crossing	Communication Conduit	Unknown	Plastic
50840	Stouffville	50.11		Enbridge Gas	Highway 7	UG - Crossing	Gas	6"	Metallic
50842	Stouffville	50.11		York Telecom Network	Highway 7	UG - Crossing	Communication Conduit	115mm	Metallic Encasing
50891	Stouffville	50.04		Alectra (Powerstream)	Pavillion Street	OH - Crossing	Conductor	16.0kV	Metallic

UID	Site Names	Mile Start	Mile End	Owner Name	Nearest Street	Utility Class	Description	Size	Material
51184	Stouffville	50.11		York Region	Highway 7	OH - Crossing	Conductor	400W	Metallic
50767	Stouffville	50.10	50.03	Unknown	Highway 7 to Pavillion Street	UG - Parallel	Culvert	400mm	Metallic
51040	Stouffville	50.12	50.11	Unknown	Highway 7	UG - Parallel	Culvert	500mm	Other
50751	Stouffville	50.12	50.11	Unknown	Highway 7	UG - Parallel	Culvert	1200 x 600mm	Concrete
50782	Stouffville	50.14	50.04	Rogers	Highway 7 to Pavillion Street	OH - Parallel	Cable	Unknown	Metallic
50773	Stouffville	50.14	50.04	Alectra (Powerstream)	Highway 7 to Pavillion Street	OH - Parallel	Conductor	16.0kV	Metallic
52155	Stouffville	50.14	50.11	York Region	South Drive (Highway 7)	UG - Parallel	Storm	27"	Concrete
50658	Stouffville	50.17	50.16	Bell	East Drive	UG - Parallel	Cable	Cable	Other
90043	Unionville Storage Yard			City of Markham	Enterprise Boulevard	UG - Crossing	Storm Sewer	300mm	Unknown
90044	Unionville Storage Yard			City of Markham	Enterprise Boulevard	UG - Crossing	Storm Sewer	Unknown	Unknown
90045	Unionville Storage Yard			City of Markham	Enterprise Boulevard	OH - Parallel	Storm Sewer	300mm	Unknown
90046	Unionville Storage Yard			City of Markham	Enterprise Boulevard	OH - Parallel	Storm Sewer	675mm/ 600mm	Unknown
90047	Unionville Storage Yard			City of Markham	Enterprise Boulevard	OH - Parallel	Storm Sewer	300mm	Unknown
90048	Unionville Storage Yard			Region of York	Enterprise Boulevard	UG - Crossing	Watermain	Unknown	Unknown

UID	Site Names	Mile Start	Mile End	Owner Name	Nearest Street	Utility Class	Description	Size	Material
90049	Unionville Storage Yard			City of Markham	Enterprise Boulevard	UG - Parallel	Watermain	Unknown	Unknown
90050	Unionville Storage Yard			Alectra	Enterprise Boulevard	UG - Parallel	Conductor	Unknown	Unknown
90051	Unionville Storage Yard			Unknown	Rouge River	UG - Parallel	Culvert	530mm	Concrete

3.6.9.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

3.6.9.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

3.6.9.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.10 EMI & EMF

Please see **Appendix J** for a copy of the EMI & EMF Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.6.10.1 EMI Sensitive Sites

Based on the baseline mapping for the Stouffville Corridor, four EMI sensitive sites were identified within Zone 3 or closer (i.e., less than 100 metres from the closest track) or between 100 metres and 250 metres (the conservative evaluation zone) from the corridor, as shown in **Table 3-43**. These were added to the list of candidate sites at which to collect baseline EMI scans during the impact assessment phase.

TABLE 3-43: EMI SENSITIVE SITE NEAR THE LAKESHORE WEST CORRIDOR

EMI Sensitive Site	Type	Coordinates	Distance to Closest Track
Agincourt Medical Imaging	Medical Imaging Facility	43°47'06.8"N, 79°16'37.3"W	Less than 100m
Gamma-Dynacare Laboratories	Medical Imaging Facility	43°48'08.8"N, 79°17'38.6"W	Greater than 100m; Less than 250m
Mount Joy Animal Hospital	Medical Imaging Facility	43°54'03.2"N, 79°15'54.4"W	Greater than 100m; Less than 250m
Medionics International Inc	Medical Imaging Facility	43°54'05.5"N, 79°15'56.8"W	Greater than 100m; Less than 250m

3.6.10.2 ELF EMF Measurements

The tables in Section 4.2.6.2 to Section 4.2.6.8 in the 2017 Electrification EMI/EMF Baseline Conditions Report (Appendix J1 of 2017 EPR) present the ELF EMF measurements at select points along the Stouffville Corridor. There was one high-ELF (> 10 mG) area along this corridor, as shown in **Table 3-44**. **Figure 3-27** shows aerial views of this location in relation to the study area. This is a location where post-electrification measurement of ELF EMF is recommended.

TABLE 3-44: SUMMARY OF HIGH ELF (>10MG) AREAS ALONG THE STOUFFVILLE CORRIDOR

Area of Interest	Coordinates	Resultant Flux Density Magnitude (mG)	References
Under 3 Overhead Utilities Power Lines	43°50'45.9"N, 79°18'56.3"W	14.6	**Figure 3-27**

FIGURE 3-27: ELF SITE IN STOUFFVILLE CORRIDOR – OVERHEAD UTILITY LINES IN RELATION TO STUDY AREA

3.6.11 Stormwater Management

Please see **Appendix K** for a copy of the Preliminary Stormwater Management Report, which details the baseline conditions assessment completed for this discipline.

3.6.11.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.11.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.11.3 OCS: Section SV-3 – Milliken Station to Unionville Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

3.6.11.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

The proposed Unionville Storage Yard is located in the City of Markham, west of the existing GO Train tracks and north of Enterprise Boulevard. Unionville GO is located southeast across the existing tracks. Refer to **Figure 3-28** and **Figure 3-29**.

The site is situated south of the Rouge River just outside of the Rouge river watershed. Final layout designs and grade elevations will determine whether the site will determine watershed drainage patterns.

The site is located within the regulation limits of TRCA. See **Appendix K** for TRCA floodplain map.

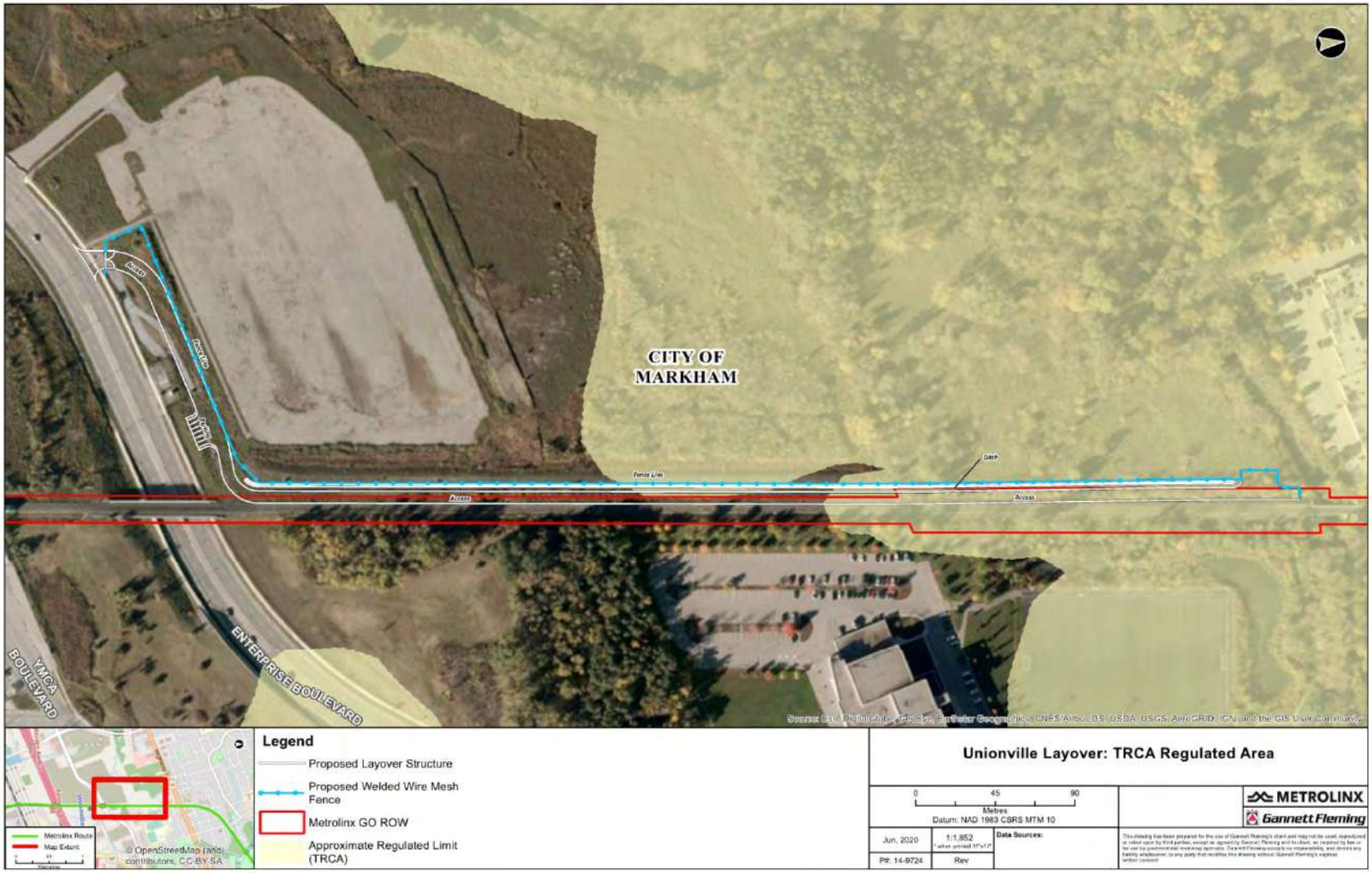

FIGURE 3-28: PROPOSED SITE LIMITS AND REGULATORY BOUNDARIES – UNIONVILLE STORAGE YARD

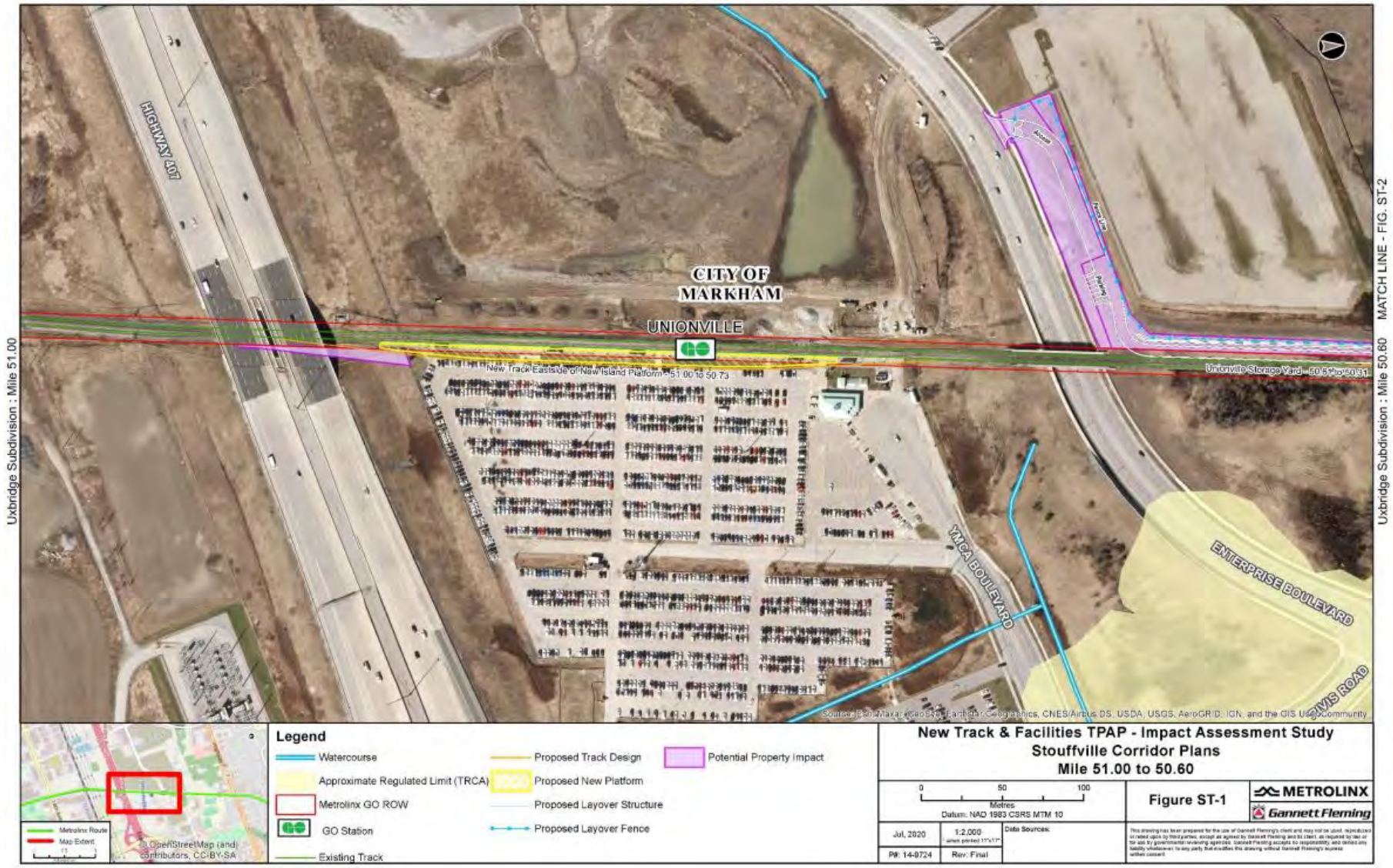

FIGURE 3-29: PROPOSED SITE LAYOUT AND PROPERTY IMPACT - UNIONVILLE STORAGE YARD 1

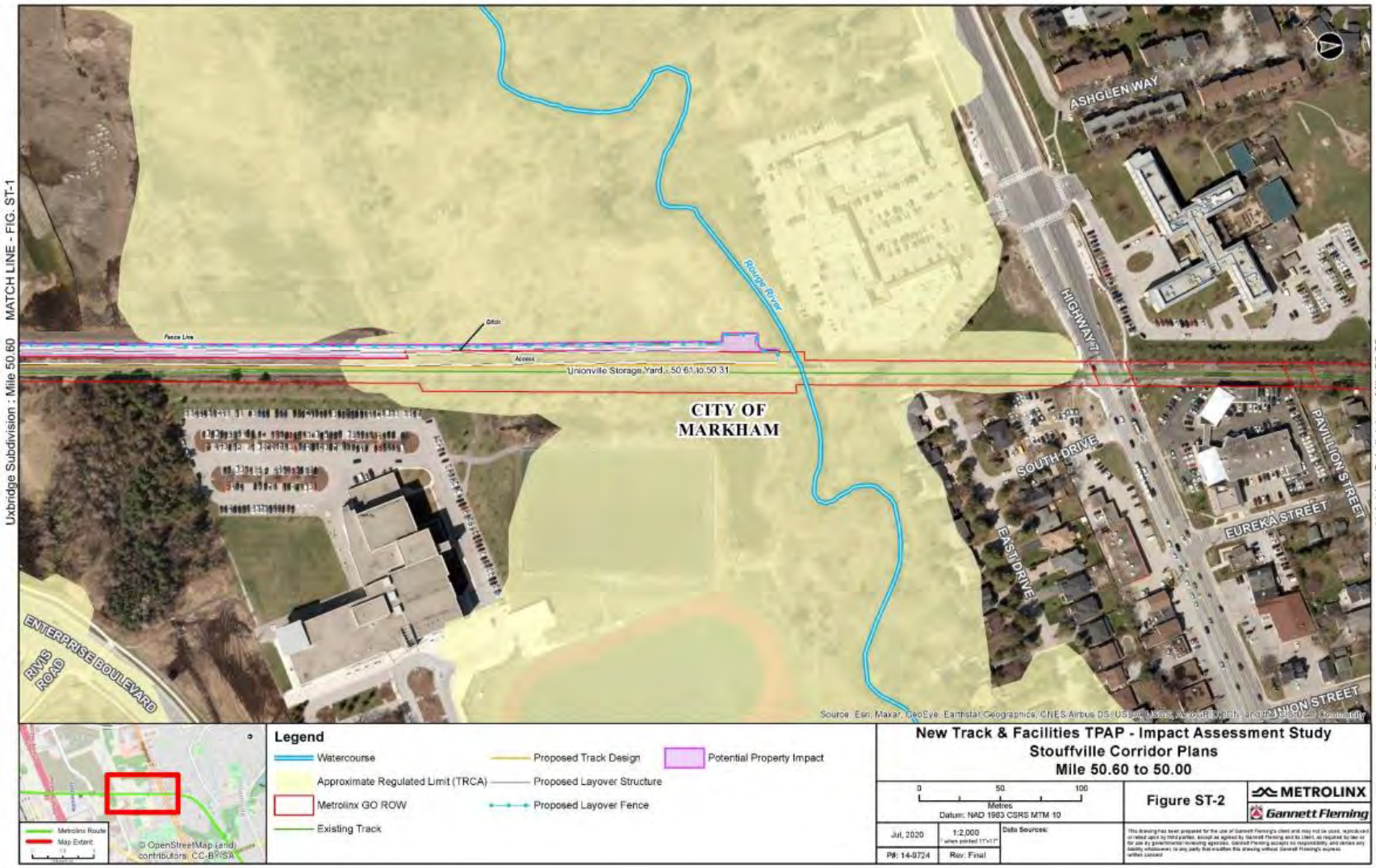

FIGURE 3-30: PROPOSED SITE LAYOUT AND PROPERTY IMPACT - UNIONVILLE STORAGE YARD 2

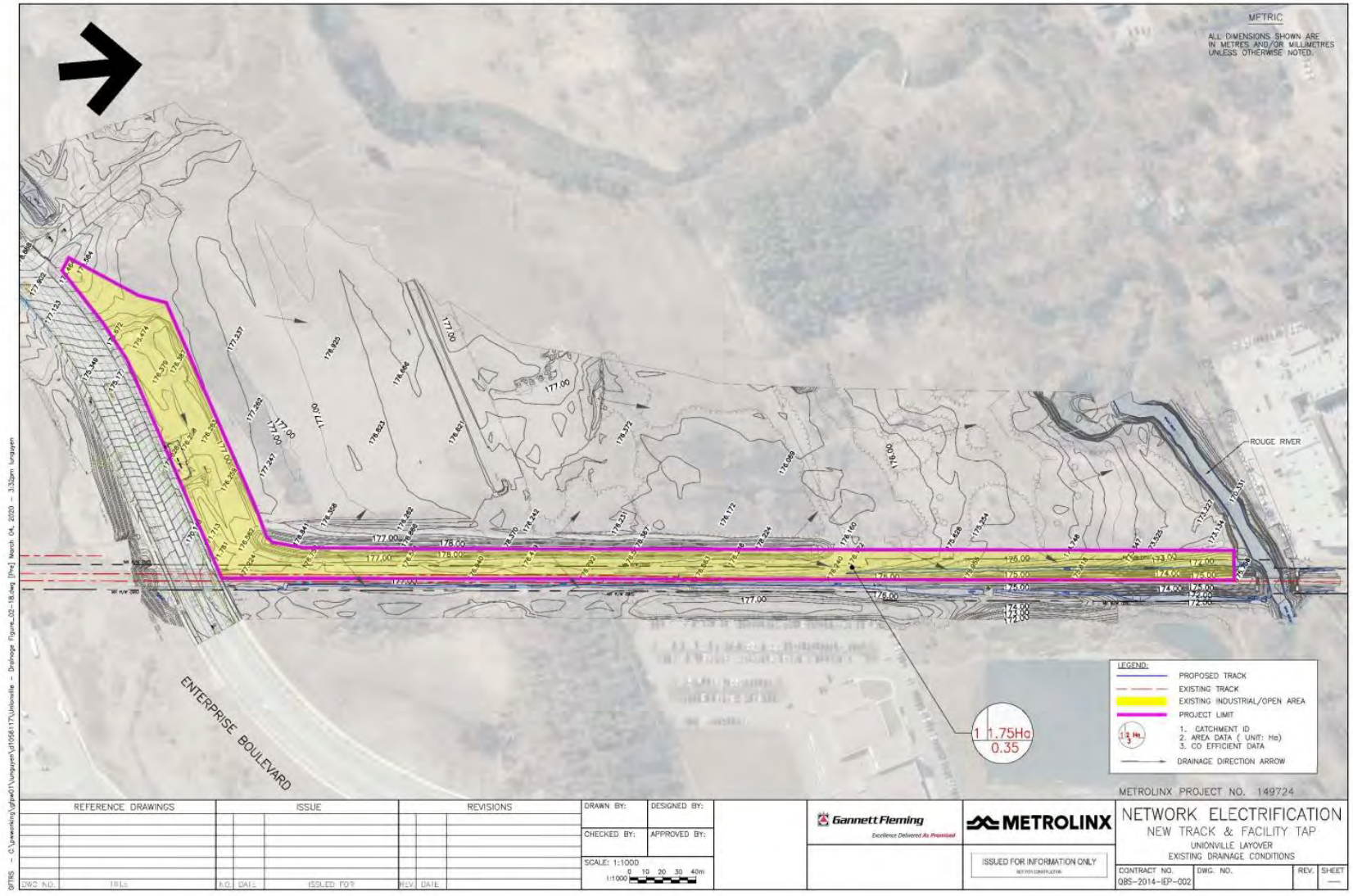

FIGURE 3-31: UNIONVILLE STORAGE YARD DRAINAGE CONDITIONS

The existing drainage pattern for the site is shown on **Figure 3-31**. The total Train Storage Facility Assessment Area is approximately 2.0 ha consisting of existing industrial space, railroad tracks/ballast and undeveloped land. The portion of the property parcel, affected by the development of the storage yard site, will be approximately 2.0 ha. In the subsequent sections of this report only the area affected by the development is considered for stormwater analysis.

Available topographic information indicates there is a berm that runs parallel to the existing tracks and prevents flow from the west from reaching the tracks. Enterprise Boulevard is grade separated below the tracks with retaining walls extending 140 metres to the west of the railway overpass structure. North of the retaining walls exists a relatively flat area which appears to have been graded for future development. The topography indicates that runoff between the berm and tracks is collected in a ditch/swale that drains north toward the Rouge River. The runoff between the area west of the berm and north of Enterprise Boulevard flows overland to the north towards Rouge River.

Detailed geotechnical and hydrogeological investigations will be required at detailed design stage to precisely determine the soil type and confirm Source Water Protection impacts and requirements.

3.6.11.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

3.6.11.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

3.6.11.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.12 Groundwater and Wells

Please see **Appendix L** for a copy of the Hydrogeological Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.6.12.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.12.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.6.12.3 OCS: Section SV-3 – Milliken Station to Unionville Station

SPPs have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater WHPA and surface water IPZ. This segment is located within the Toronto SPA.

With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. This data does not reflect ground water patterns in deeper aquifers.

This section of the study is within the network of the Rouge River Sub-watershed. Like most of the other watersheds in the TRCA jurisdiction, waters within the watershed originate from the ORM flow south to Lake Ontario. As part of the 2007 watershed report (TRCA, 2007), 40% to 80% of the baseflow in the Rouge

River tributaries was sourced from the shallow ORM Aquifer Complex. However, baseflow losses were significant in the southern reaches of the watershed.

The surface water quality in the Rouge River Sub-watershed is generally considered clean with no significant parameters of concern (TRCA, 2007). Phosphorus levels have decreased; however, as a result of increased urbanization, chloride levels have increased over the decade.

According to the 2017 Electrification assessment along this segment of corridor, there were 25 domestic supply wells, two (2) agricultural supply wells, five (5) industrial/commercial supply wells and one (1) supply well of unknown type identified within 500 metres of the rail corridor in this section. However, this section is characterized by an urban setting and the use of private water wells is likely negligible.

No wetland features exist within this section of the study area.

3.6.12.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

SPPs have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater WHPA and surface water IPZ. The regional physiography in this area is defined as Peel Plain with the surficial geology described as being predominantly composed of stone-poor, low permeability silty to sandy till. Near Enterprise Boulevard, soils change to foreshore-basinal deposits over the till with alluvial deposits furthest north (Chapman and Putnam, 1984). This area is not located within a WHPA or IPZ, but is located within the Toronto SPA.

With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. This data does not reflect ground water patterns in deeper aquifers. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-45** below.

TABLE 3-45: SECTION SV-4 - SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
SV	SV-4	2 – 6	0.011	northeast

This section of the study is within the network of the Rouge River Sub-watershed. Like most of the other watersheds in the TRCA jurisdiction, waters within the watershed originate from the ORM flow south to Lake Ontario. As part of the 2007 watershed report (TRCA, 2007), 40% to 80% of the baseflow in the Rouge River tributaries was sourced from the shallow ORM Aquifer Complex. However, baseflow losses were significant in the southern reaches of the watershed.

The surface water quality in the Rouge River Sub-watershed is generally considered clean with no significant parameters of concern (TRCA, 2007). Phosphorus levels have decreased; however, as a result of increased urbanization, chloride levels have increased over the decade.

According to the 2017 Electrification assessment along this segment of corridor, there were 85 domestic supply wells, six (6) agricultural supply wells, 16 industrial/commercial supply wells and two (2) municipal supply wells identified within 500 metres of this section of the rail corridor. However, this section is characterized by an urban setting and the use of private water wells is likely negligible. There are five (5) waterbodies, Robinson Creek, unnamed tributary of the Rouge River, Eckardt Creek, Bruce Creek and Rouge River located within 500 metres of the rail corridor.

Within this section of the corridor, there is the Rouge River, a coldwater creek with permanent flows towards the east, west and south.

3.6.12.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

SPPs have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater WHPA and surface water IPZ. This segment is located within the Toronto SPA.

With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. This data does not reflect ground water patterns in deeper aquifers. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-46** below.

TABLE 3-46: SECTION SV-5 - SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
SV	SV-5 to SV-6	2 – 2	0.008	south

This section of the study is within the network of the Rouge River Sub-watershed. Like most of the other watersheds in the TRCA jurisdiction, waters within the watershed originate from the ORM flow south to Lake Ontario. As part of the 2007 watershed report (TRCA, 2007), 40% to 80% of the baseflow in the Rouge River tributaries was sourced from the shallow ORM Aquifer Complex. However, baseflow losses were significant in the southern reaches of the watershed.

The surface water quality in the Rouge River Sub-watershed is generally considered clean with no significant parameters of concern (TRCA, 2007). Phosphorus levels have decreased; however, as a result of increased urbanization, chloride levels have increased over the past decade.

There were five (5) domestic supply wells, one (1) agricultural supply well and six (6) industrial/commercial supply wells identified within 500 metres of the rail corridor in this section. This section is characterized by an urban setting and the use of private water wells is likely negligible.

There is one (1) waterbody, Mount Joy Creek, located within 400 metres of the rail corridor. The Mount Joy Creek has intermittent flow and provides warmwater habitat.

3.6.12.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

SPPs have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater WHPA and surface water IPZ. The regional physiography in this area is defined as Peel Plain with the surficial geology at SV-6 described as being predominantly comprised of stone-poor, silty to sandy till which are overlain by foreshore-basinal deposits further to the north (Chapman and Putnam, 1984). SV-6 is not located within a WHPA or IPZ.

With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. This data does not reflect ground water patterns in deeper aquifers. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-47** below.

TABLE 3-47: SECTION SV-6 - SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
SV	SV-5 to SV-6	2 – 2	0.008	south

This section of the study is within the network of the Rouge River Sub-watershed. Like most of the other watersheds in the TRCA jurisdiction, waters within the watershed originate from the ORM flow south to Lake Ontario. As part of the 2007 watershed report (TRCA, 2007), 40% to 80% of the baseflow in the Rouge River tributaries was sourced from the shallow ORM Aquifer Complex. However, baseflow losses were significant in the southern reaches of the watershed.

The surface water quality in the Rouge River Sub-watershed is generally considered clean with no significant parameters of concern (TRCA, 2007). Phosphorus levels have decreased; however, as a result of increased urbanization, chloride levels have increased over the decade.

According to the 2017 Electrification assessment along this segment of corridor, there were 39 domestic supply wells, one (1) agricultural supply well and two (2) industrial/commercial supply wells identified within 500 metres of the rail corridor in this section. The section is characterized by a mixed urban and rural setting with possible private water well use. There are four (4) waterbodies, Mount Joy Creek, Greensborough Wetland Complex, Little Rouge Creek and Stouffville Creek, located within 500 metres of the rail corridor.

There is a watercourse crossing within this section of the study area. The Mount Joy Creek has intermittent flow and provides warmwater habitat.

3.6.12.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7 Lakeshore East Rail Corridor

3.7.1 Natural Environment

A Natural Environment Assessment Report (refer to **Appendix A**) was prepared, which details the baseline condition within the additional study area.

3.7.1.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.1.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.1.3 OCS/New Layover Facility – Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

3.7.1.3.1 Terrestrial

This section of the corridor is located within Ecoregion 7E-4. Surrounding land use consists of a mix of residential, commercial and industrial uses.

3.7.1.3.1.1 Wetlands

No wetlands features are present within this segment of the Project study area.

3.7.1.3.1.2 Vegetated Areas

The study area contains a large proportion of Commercial and Institutional lands (CVC), Transportation and Utilities (CVI), and Residential Lands (CVR). The vegetated communities within this corridor section are limited to Green Land (CGL) areas and small pockets of Deciduous Woodlands (WOD).

At the Midland Layover, a narrow row of meadow (ME) vegetative species, such as Kentucky Bluegrass, Smooth Broome, and Manitoba Maple, line the existing rail corridor through much of this segment within the

Project study area. A small forest consisting of a deciduous woodland (WOD) and parkland (CGL2) occurs towards the north/northeast portion of this segment.

Vegetation communities generally demonstrated a high degree of disturbance that is typical of urban environments, including a high proportion of non-native and invasive plant species. No rare or unique communities were documented.

3.7.1.3.1.3 Wildlife

No significant Wildlife Habitat is present within this corridor; however, the small pockets of WOD and CGL communities may potentially provide nesting and foraging habitat for breeding birds. Generally, the Midland Layover site provides limited wildlife habitat, including narrow areas of old field and regenerating woody vegetation.

3.7.1.3.2 Aquatic

There are no watercourses within the study area.

3.7.1.3.3 Species at Risk

Four species has the potential to occur within the study area: Butternuts, Chimney Swift, Monarch and Nine-spotted Lady Beetle. The species at risk screening determined one species of SAR (i.e., Monarch) has the potential to occur within the proposed Midland Layover site due to the potential for the removal of milkweed within the meadow areas. Pre-construction surveys for Monarch and milkweed are recommended to confirm the continued absence of this species in meadow areas. Should Monarchs be encountered, revegetation initiatives should include seeding or transplanting of milkweed.

3.7.1.3.4 Significant Wildlife Habitat

No SWH candidate or confirmed areas were identified through previous TPAP studies. An updated evaluation determined that candidate habitat is very limited which may include candidate bat roost habitat. Potential suitable habitat for Monarch was identified in this segment due to potential meadow habitat. Removal and temporary disturbance to meadow habitat is not expected to have a significant impact on this species since there was no milkweed (the larval host plant for Monarch) recorded during the evaluation.

3.7.1.3.5 Designated Areas

No provincially or municipally designated features are present within this segment of the Project study area.

3.7.1.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.1.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.1.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.1.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.1.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

3.7.1.8.1 Terrestrial

This section of the corridor is located within Ecoregion 6E-13 and Ecoregion 7E-4. Surrounding land use consists primarily of residential, commercial and institutional uses.

3.7.1.8.1.1 Wetlands

There is one PSWs (Corbett Creek Coastal Wetland Complex) present within this portion of the study area.

3.7.1.8.1.2 Vegetated Areas

The study area contains a large proportion of Commercial and Institutional lands (CVC), Transportation and Utilities (CVI), Residential Lands (CVR), and Constructed Lands (CV). The vegetated communities within this corridor include Deciduous Thicket (THD), Cultural Meadow (CUM), Marsh (MA), Meadow Marsh (MAM), and Agriculture (AG).

3.7.1.8.1.3 Wildlife

The MA community within the Whitby Harbour Wetland Complex PSW may provide staging, foraging and overwintering habitat for turtles and breeding and foraging habitat for amphibians and marsh birds. The THD communities may provide nesting and foraging habitat for breeding birds. The CUM communities may provide foraging habitat for pollinating insects.

3.7.1.8.2 Aquatic

There are two watercourses within the corridor segment: a Tributary of Corbett Creek (Corbett Creek West) and Corbett Creek (Corbett Creek East).

Thermal regimes throughout Corbett Creek (and its tributaries) vary from coldwater to warmwater. Both the East and West branches of Corbett Creek headwaters originate on the Lake Iroquois Plain. Both branches outlet into Lake Ontario at the Corbett Creek Marsh, in the Town of Whitby (CLOCA, 2005). The MNRF manages the fish habitat in this system for warmwater species.

Information obtained from an MTO study (SLR, 2016) indicates that Corbett Creek West is known to provide fish and fish habitat. At that time, MNRF indicated that White Sucker, Brown Bullhead (*Ameiurus nebulosus)*, Pumpkinseed, and Brook Stickleback (*Culaea inconstans)* existed in the watercourse. Fish collections completed as part of that study found young-of-year Cyprinids in this system just upstream of the Project study area. The portion of channel through the study area is conveyed through a culvert under the rail bed.

Similar information provided by MNRF as part of the MTO study indicated that the small Tributary of Corbett Creek East was not known to provide fish and fish habitat, although fish collections conducted indicated that the watercourse supported a small number of fish including Creek Chub (*Semotilus atromaculatus).* The lower portion East Branch downstream of the Project study area was identified by MNRF to support Muskellunge (*Essox masquinongy)*, Pumpkinseed, Brown Bullhead, and White Sucker; while investigations completed as part of that study indicated that White Sucker, Longnose Dace, and Creek Chub are also present in the subject section of this watercourse.

3.7.1.8.3 Species at Risk

Four species have the potential to occur within the study area: Butternuts, Chimney Swift, Monarch, and Nine-spotted Lady Beetle.

3.7.1.8.4 Significant Wildlife Habitat

No SWH candidate or confirmed habitats were identified in these segments of the Project study area during previous TPAP studies. An evaluation completed in 2019 (NT&F Natural Environment Baseline Conditions Report, Gannett Fleming [2020]) determined that SWH habitat is extremely limited. In addition to potential

bat roost habitat, candidate SWH may include Amphibian Movement Corridors. Possible amphibian movement may occur between north (wetland) areas (outside of the Project study area) of Corbett creek and south (woodland) areas of the Corbet Creek Costal Wetland Complex.

3.7.1.8.5 Designated Areas

This portion of the study area is located within the jurisdiction of CLOCA and Aurora District MNRF. Corbett Creek Coastal Wetland Complex PSW is within the study area.

3.7.2 Preliminary Environmental Site Assessment

A Preliminary Environmental Site Assessment (refer to **Appendix B**) was prepared for new layover facilities, which details the baseline condition within the additional study area. Details on the assessment of additional OCS infrastructure along the corridor is provided below, where applicable.

3.7.2.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.2.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.2.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment within the corridor segment is recommended at this time.

A Preliminary Environmental Site Assessment (ESA) was completed for the Midland Layover site as part of the SJGS TPAP.

The proposed Midland Layover is located along the Lakeshore East Rail Corridor ROW between Midland Avenue and Brimley Road. Three sets of tracks from the Lakeshore East Rail Corridor are present along this segment, as well as a railway storage area along the north side of the tracks. During the March 2019 site visit, this storage area was used to store machinery, rail ties, rails and other railway supplies.

Two (2) areas of potential environmental concern (APEC) were identified for the subject property. There were also potentially contaminating activities (PCAs) identified at the subject property and within the 250 m study area buffer applied to this investigation, as follows:

- Gasoline and Associated Products Storage in Fixed Tanks, and
- Rail Yards, Tracks and Spurs.

A detailed list of APECs and PCAs can be found in **Table 3-48**.

TABLE 3-48: LOCATION OF APECS AND PCAS WITHIN THE MIDLAND LAYOVER STUDY AREA

APEC	PCA	Location of PCA	Contaminants of Potential Concern	Media Potentially Impacted	Risk Rating
6	Gasoline and Associated Products Storage in Fixed Tanks (PCA 28)	Off-site (#8 – S)	• PHCs • VOCs • PAH • SVOCs	• Soil • Groundwater	Medium
6	Rail Yards, Tracks and Spurs (PCA 46)	Off-site (#9 – S)	• PHCs • VOCs • PAHs • Metals • Inorganics • Pesticides • PCBs • CPs	• Soil • Groundwater	Medium

3.7.2.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.2.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.2.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.2.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.2.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

3.7.3 Built Heritage Resources and Cultural Heritage Landscapes

Please refer to **Appendix C1** for a description of methodology followed for identification of potential cultural heritage resources within the additional study area.

3.7.3.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.3.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.3.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

No BHRs or CHLs are located within the rail corridor or the 30m buffer around the Midland Layover.

3.7.3.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.3.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.3.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.3.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.3.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

No BHRs or CHLs are located within the rail corridor or the 30 metre buffer.

3.7.4 Archaeology

A review of the historic land use of the Lakeshore East Corridor indicates that it has been occupied by Indigenous peoples for thousands of years. The corridor is situated within the traditional territory occupied by the ancestral Huron-Wendat; however, the north shore of Lake Ontario was abandoned at around the turn of the sixteenth century. The corridor was subsequently utilized by the Seneca First Nation for hunting until the late seventeenth century; and, subsequently occupied by Ojibwa First Nations until 1805 and, 1923 (AANDC 2013f; Benn 2008; Ellis 2013; Williamson 2013).

The background research also acknowledges that since the turn of the eighteenth century, the Métis have lived throughout the Province of Ontario but are often muted in the historical record (MNC n.d.; Stone and Chaput 1978:607,608). Since 1805, the corridor has been occupied by Euro-Canadian peoples and is situated within the former Townships of Scarborough and York, County of York; and, since 1790s in the former Townships of East Whitby, Pickering and Whitby, County of Ontario (Armstrong 1985). A review of 19th century mapping indicates that the corridor includes both historic features and transportation routes (Beers 1877; Miles & Co. 1878; Shier 1960; Tremaine 1860).

Please see **Appendix D** for a copy of the Archaeological Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.7.4.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.4.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.4.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

Section LSE-3 meets the following criteria which are indicative of archaeological potential:

- Proximity to Euro-Canadian settlement (Scarborough);
- Proximity to historic transportation route (McCowan Road, Eglinton Avenue, Grant Trunk Railway, Kingston Road);
- Proximity to historic features (Farmstead);
- Well-drained sandy soil (Woburn sandy loam, fox sandy loam);
- Proximity to previously registered archaeological sites (AkGt-15);
- Proximity to water source (Lake Ontario, West Highland Creek); and
- Associated First Nation occupation.

Segments within the study area are located in Borden block *AkGt*. According to the OASD (MHSTCI 2019), one previously registered archaeological site is located within one kilometre of the study area, which is not located within 50 metres. Site details are presented below in **Table 3-49**.

TABLE 3-49: SECTION LSE-3 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AkGt-15	Heinze	Pre-Contact Indigenous	Camp/campsite	Konrad 1950

This section has been subject to one previous archaeological assessment:

- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016

These criteria are indicative of potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A Stage 1 Archaeological Assessment (AA) has been undertaken for the Midland Layover as part of the 2020 Scarborough Junction Grade Separation EPR, which has indicated that there is no archaeological potential within the proposed layover footprint. The area is disturbed or has been previously assessed, and is considered to have no archaeological potential.

3.7.4.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.4.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.4.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.4.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.4.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

Section LSE-8 meets the following criteria which are indicative of archaeological potential:

- Proximity to Euro-Canadian settlement (Whitby);
- Proximity to historic transportation route (Thickson Road, Grand Trunk Railway, Lake Ridge Road);
- Proximity to historic features (farmsteads);
- Well-drained sandy soil (Darlington loam);
- Proximity to previously registered archaeological sites (see **Table 3-50**); and
- Proximity to water source (Lake Ontario, Corbett Creek, Lynde Creek).

Segments within this study are located in Borden block *AlGr*. According to the OASD (MHSTCI 2019), three previously registered archaeological sites are located within one kilometre of the study area, none of which are located within 50 metres. Site details are presented below in **Table 3-50**.

TABLE 3-50: SECTION LSE-8 – PREVIOUSLY REGISTERED ARCHAEOLOGICAL SITES WITHIN 1KM

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AlGr-6	Walter Huron 1	Paleo-Indian, Late	Unknown	Arthur Roberts 1977; Richard Sutton 1978
AlGr-7	Walter Huron 2	Archaic	Camp/campsite	Arthur Roberts 1977; MIA 1983
AlGr-13	Glenway 2	Pre-Contact Indigenous	Scatter	MIA 1984
AlGr-173	n/a	Pre-Contact Indigenous	Findspot	ASI 2005

This section has been subject to one previous archaeological assessment:

- (ASI 2017a) Stage 1 Archaeological Assessment GO Rail Network Electrification TPAP City of Toronto, Regional Municipalities of Peel, Halton, York and Durham, County of Simcoe, Ontario P057-0834-2016

These criteria are indicative of the study area as having potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

A stage 1 archaeological assessment was completed in support of this EPR Addendum. The determination of archaeological potential is presented in Section 4.

3.7.5 Land Use and Socio-Economic

Please see **Appendix E** for a copy of the Land Use and Socio-Economic Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.7.5.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.5.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.5.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

3.7.5.3.1 Existing Land Use

East of Midland Avenue, land uses alternates between *Neighbourhoods*, *Apartment Neighbourhoods*, *Employment Areas*, and *Mixed Use Areas*, with some *Parks* and a large swath of *Other Open Space Areas* between Markham Road and Guildwood GO Station. A majority of higher density residential uses are within *Mixed Use* areas. Undeveloped lands are located south of the rail corridor between Jeanette Street and Brimley Road and north of the rail corridor, just west of the Eglinton GO Station. Official Plan land use designations along this section of the rail corridor is shown in **Figure LSE-13** in **Appendix E**.

McCowan District Park is located adjacent to the rail corridor to the west of McCowan Road. The Scarboro Golf and Country Club is located north of the rail corridor between Markham Road and Orton Park Road. Based on currently available information, Toronto's trails include the Natal Park and McCowan District Park. The Natal Park Trail runs parallel to the rail corridor within Natal Park. The McCowan District Park Trail runs south of the corridor west of Eglinton GO Station.

There are no hospitals, schools, places of worship, child-care centres or long-term care centres in the vicinity of the rail corridor near the proposed track infrastructure.

Within the vicinity of the proposed Midland Layover site, land uses to the northwest of the rail corridor are primarily *Residential Apartment* and *Open Space*, while areas southeast are designated as *Residential* and *Open Space*. The Midland Layover site is situated on lands designated as *Utility and Transportation*. Sidewalks extend along Midland Avenue and within the residential subdivision to the northwest and southeast of the rail corridor. There is a medical institution, religious institution and child-care centre, along with a number of parks in the vicinity of the rail corridor near the proposed layover.

3.7.5.3.2 Planned Land Use

There are no Secondary Plans affecting the lands adjacent to this section of the rail corridor. Undeveloped lands west of Brimley Road are designated *Employment Areas* and west of the Eglinton GO Station as *Mixed Use Areas*.

Lands along Kingston Road in Toronto, from west of Guildwood GO station to east of Highland Creek, are part of the Kingston Road Avenue Study. The study, being carried out in phases to amend the City of Toronto Official Plan and Zoning By-law, identifies a plan for future development along Kingston Road including improvements to streetscape planning, landscaping, road improvements and improved access to public transit.

As advised by the City of Toronto, mid-rise and low-rise developments have been proposed adjacent to the rail corridor at 253 Markham Road, 12, 10 and 30 Dunelm Street and 90 Dale Avenue. The developments at 253 Markham Road and 12, 20 and 30 Dunelm Street are south of the rail corridor, in lands that are currently open space / vacant and are designated *Neighbourhoods*. 432 residential units are proposed. The development at 90 Dale Avenue is located south of the rail corridor at Dale Avenue and Kingston Road. The lands are designated *Apartment Neighbourhoods.* These developments have not been approved by the City.

There are no planned and approved recreational amenities bordering this section of the rail corridor. The rail corridor is zoned *Utility and Transportation* under the City of Toronto Zoning By-law 569-2013.

According to the City of Toronto, a Site and Area Specific Policy is in place for the residential area between Midland Avenue and Brimley Road north of St. Clair Avenue (and south of the rail corridor). A total of eight

policy directions have been identified. Policies range from new residential development and development guidelines, to specific references to Zoning By-Laws and aesthetic characteristics (to be maintained).

3.7.5.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.5.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.5.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.5.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.5.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

3.7.5.8.1 Existing Land Use

East of the Whitby GO Station, land uses are largely characterized by significant sections of *Prestige Industrial land,* which is located to the north and south of the rail corridor between Whitby GO Station and South Blair Street. The *Prestige Industrial lands* extend to the north of the corridor and Highway 401, east of South Blair Street. The majority of land east of South Blair Street and south of the corridor are designated *General Industrial*. Lands from the western municipal border to the Oshawa GO Station are designated as *Industrial*. East of the Oshawa GO Station, lands are designated as *Industrial* south of the rail corridor and *Planned Commercial Centre* and *Special Purpose Commercial* north of the rail corridor.

Some undeveloped land is located north of the rail corridor, east of Brock Street South. Larger swaths of undeveloped land are located on both sides of the rail corridor between South Blair Street and the Oshawa GO Station. Official Plan land use designations along this section of the rail corridor are shown in **Figures LSE-39 to LSE-40** in **Appendix E**.

Two trails cross this section of the rail corridor (the Joseph Kolodzie Oshawa Creek Bike Path and the Michael Starr Trail).

There are no hospitals, schools, places of worship, child-care centres or long-term care centres in the vicinity of the rail corridor.

3.7.5.8.2 Planned Land Use

There are no Secondary Plans affecting the lands adjacent to this section of the rail corridor. Undeveloped land east of Brock Street South is designated *Utility*. The larger swaths of undeveloped land between South Blair Street and the Oshawa GO Station are designated *General Industrial*, *Commercial Node* and *Hazard Land* in Whitby and *Industrial* in Oshawa.

A Boulevard Multi-Use Path is proposed along Victoria Street West, crossing the rail corridor west of South Blair Street. The rail corridor does not have any zoning designation under the Town of Whitby's zoning by-laws and the City of Oshawa Zoning By-law 60-94.

3.7.6 Air Quality

Since 2017, Metrolinx has made significant changes to the planned rail infrastructure and train service for the GO Expansion Program, of which Electrification forms a part. The potential air quality impacts of trains and associated equipment and infrastructure have been assessed at both the regional scale, and locally in

those segments of the corridors which are expected to experience an increase in diesel (i.e. non-electrified) powered equipment activity relative to the 2015 (pre-project or baseline) levels and which have sensitive receptors exposed to the rail corridor. While diesel service levels will remain the same or decrease (with electric train service taking up the planned increased service levels), there will be an increase in the number of diesel locomotives operating on some corridors. This is due to the need to power diesel trains with two locomotives rather than one during peak periods.

The air quality baseline conditions within the additional study area for this discipline are detailed in **Appendix F4**.

For modelling purposes, due to the long length of the corridor, the LSE Study Area was arbitrarily divided into four study segments. Segment 1 begins west of the Don River (in Toronto, east of Union Station) and ends east of the proposed Midland layover, approximately 13.7 km in length. Segment 2 begins adjacent to Segment 1 (east of the Midland layover),and ends at Manse Road in Toronto, approximately 6.5 km in length. Segment 3 begins west of Rouge Hill GO Station and continues to Pickering GO Station, approximately 9 km in length. Segment 4 begins west of Ajax GO Station and ends east of the Whitby Rail Maintenance Facility[63], approximately 12.1 km in length. These four segments encompass the areas that have significant amounts of residential use in proximity to the rail corridor (within 150m of it). A such, they cover the areas of worst-case potential impact. The lateral extent of the study area was 500m around stations and layovers, and 300m on either side of the tracks away from stations and layovers.

There are eight existing stations and one future GO Station in the LSE study area:

- East Harbour GO Station (future)
- Danforth GO Station
- Scarborough GO Station
- Eglinton GO Station
- Guildwood GO Station
- Rouge Hill GO Station
- Pickering GO Station
- Ajax GO Station
- Whitby GO Station

In addition to GO Stations, two existing layovers – the Henry layover and the Whitby Rail Maintenance facility – are included in the LSE study area. In the future, an additional layover, the Midland layover, will be located to east of Scarborough GO Station.

Traffic volumes associated with the proposed service extension to Bowmanville are assessed as part of this study. However, the study area of this assessment does not extend east of Oshawa GO Station. The assessment of the area east of Oshawa GO Station will be assessed and reviewed under a separate Environmental Assessment (EA). New GO Stations (including East Harbour GO Station) have been assessed explicitly under separate EAs. They are assessed in this study only in how they affect train movements on the LSE Corridor (i.e., trains stopping, idling, and starting at the Station).

Baseline service levels are based on the maximum levels in 2015. Baseline service levels within the LSE study area are shown below in **Table 3-51**. All trains listed in **Table 3-51** are powered by a single diesel locomotive.

[63] Referred to as East Rail Maintenance Facility (ERMF) within 2017 GO Rail Network Electrification EPR.

TABLE 3-51: MAXIMUM BASELINE SERVICE LEVELS IN LSE STUDY AREA

Segment	GO Transit diesel revenue trains per day	GO Transit diesel non-revenue trains per day	Diesel revenue VIA trains per day	CN Freight diesel trains per day
Segment 1	78	8	35	2
Segment 2	72	8	35	2
Segment 3	88	8	35	1
Segment 4	81	5	35	1

For the future scenario, the future rail schedule service levels account for operational and safety considerations and regulations that limit the service levels achievable with a given infrastructure design. Current rail regulations are principally governed by Transport Canada and the US Federal Rail Administration. Rail policy has also been developed by the American Railway Engineering and Maintenance of Way Association (AREMA) and the American Public Transportation Association (APTA). Metrolinx, Canadian National (CN) and Canadian Pacific (CP) Railway have also established additional operational policies, standards, and rules to ensure safe and reliable service.

Collectively, these regulations and policies dictate how railways are designed, operated and maintained. To expand rail service, the regulations and policies have to be considered. If the existing infrastructure does not allow expanded service, then new infrastructure must be considered. Service goals represent long term planning upon which infrastructure plans are developed.

In the future scenario, the train fleet travelling on the LSE will be both electric and diesel. The future service levels of diesel trains travelling on the LSE corridor can be seen in **Table 3-52** below.

TABLE 3-52: MAXIMUM FUTURE SERVICE LEVELS IN LSE STUDY AREA

Segment	GO Transit diesel revenue trains per day (1 locomotive)	GO Transit diesel revenue trains per day (2 locomotive)	GO Transit diesel non-revenue trains per day (1 locomotive)	GO Transit diesel non-revenue trains per day (2 locomotive)	Diesel revenue VIA trains per day (1 locomotive)	CN Freight diesel trains per day (1 locomotive)
Segment 1	40	55	1	13	35	2
Segment 2	40	55	8	0	35	2
Segment 3	40	55	8	0	35	2
Segment 4	38	41	21	10	35	0

Note that the future rail schedule includes a 10% mark-up of actual projected diesel service levels, to help ensure that the air quality assessment is conservative.

Table 3-53 and **Table 3-54** present background concentrations for all contaminants and relevant averaging times.

TABLE 3-53: SUMMARY OF BACKGROUND CONCENTRATION LEVELS IN STUDY AREA

Contaminant	Averaging Time	Background concentrations ($\mu g/m^3$)
CO	1 hour	219
	8 hours [2]	1189
NO_2	Annual	22
$PM_{2.5}$	Annual	7.8
PM_{10} [1]	24 hours	26
Benzene	24 hours	0.80
	Annual	0.52
Benzo(a)pyrene	24 hours	8.2E-05
	Annual	4.8E-05
1,3-Butadiene	24 hours	0.067
	Annual	0.039
Formaldehyde	24 hours	3.5
Acetaldehyde	24 hours	1.7
Acrolein	1 hour [3]	0.12
	24 hours	0.07

[1] Ambient Background Level estimated from $PM_{2.5}$ levels using published emission factors (Lall et al., 2004)
[2] 90th percentile 8-hour ambient CO data were not available; the maximum 8-hour concentration from NAPS Station 60430 – Toronto West and NAPS Station 60440 - Toronto North was used
[3] 1-hr average ambient acrolein data were not available; the maximum 24-hr concentration from NAPS Station 62601- Experimental Farm, Simcoe, ON was used.

TABLE 3-54: 90TH PERCENTILE BACKGROUND NO_2 AND $PM_{2.5}$ CONCENTRATIONS BY HOUR OF DAY

Hour of Day	NO_2 (µg/m^3)	$PM_{2.5}$ (µg/m^3)
1	57	17
2	55	17
3	55	17
4	55	16
5	57	16
6	63	17
7	65	17
8	63	16
9	57	16
10	48	15
11	40	15
12	36	14
13	32	15
14	30	14
15	32	14
16	34	13
17	36	14
18	42	14
19	46	15
20	49	15
21	53	16
22	57	17
23	59	17
24	59	17

A comparison of background concentrations to the applicable AAQC's and CAAQS shows that the background concentrations generally meet the air quality objects, with the exception of benzo(a)pyrene and annual average benzene concentrations. This situation with the latter two air contaminants is not unique to the study area, but is widespread across Southern Ontario.

3.7.7 Noise and Vibration

The noise and vibration baseline conditions within the additional study area for this discipline are detailed in **Appendix G6**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.6.

The LSE Corridor Study Area begins just east of the Don River and ends at the Oshawa GO Station, approximately 50 kilometres in length. However, the results of the noise modelling are not presented in this report for the western section of the corridor from Don River to Carlaw Avenue. The reason is that future noise impacts for this section of the Corridor will include those from Metrolinx operations as well as from operations of the Ontario Line subway, which will run above ground through this section. The combined noise impacts from Metrolinx and Ontario Line operations, and associated noise mitigation recommendations, will be addressed in a separate report as part of the Ontario Line EA process. The Study Area is shown in **Figure 3-32**.

The same is not true for vibration, since impacts from Metrolinx GO operations are separate from those from the Ontario Line; that is, vibration from rail movements on separate tracks are not cumulative. As well, any vibration mitigation for Metrolinx GO operations would address new Metrolinx trackwork, while any impacts

from the Ontario Line would be addressed on those separate tracks. The current report therefore addresses vibration impacts from Metrolinx GO operations, and associated mitigation, for new trackwork throughout the entire LSE corridor.

Noise receptors for this assessment include the following sensitive land uses:

- Residences;
- Hotels, motels and campgrounds;
- Schools, universities, libraries and daycare centres;
- Hospitals and clinics, nursing / retirement homes;
- Churches and places of worship;
- Planned residential developments with approved building permits from the Municipality; and
- Vacant lots that are currently zoned for residential use.

Noise receptors within the Study Area are mainly residential houses located adjacent to the LSE Rail Corridor. In general, areas of receptors were identified using publicly available address point databases or through visual identification using publicly available satellite aerial images.

In the 2017 EPR, vacant lots were only assessed for residential developments with approved building permits. In this addendum, all vacant lots that are zoned for residential use (with or without building permits) were included in the assessment. All vacant residential lots within the Study Area were considered.

Representative noise receptors were chosen to simplify the presentation of results for a much larger number of receptors assessed. The representative noise receptors are summarized in **Table 3-55** to **Table 3-56**. Complete mapping of noise receptors is included in **Appendix G.**

For the assessment of vibration, the proximity of all noise receptors within the LSE Corridor to changes in track alignment or special trackwork was assessed. The following areas were identified as areas of investigation for operational vibration:

- The approximately 12 km of future track between Don River and the Scarborough Junction, including approximately 1 km of track on the north and south sides of the LSE Corridor just before the Scarborough Junction;
- The approximately 500 m of new track just east of Eglinton GO Station;
- The approximately 6 km of future track between Guildwood GO Station and Rouge Hill GO Station;
- The approximately 650 m of future track at the new island platform at Pickering North GO Station;
- The approximately 1 km of future track between Whitby GO Station and Henry Layover;
- The approximately 500 m of future track just west of WRMF;
- The approximately 1 km of future track between WRMF and Oshawa GO Station;
- The approximately 100 m of future track at the new island platform at Oshawa GO Station; and
- 44 new switches along the Corridor.

Receptors for vibration include the same sensitive land uses as described in the noise assessment. However, future development locations that did not have approval for residential uses were not included since they would need to be designed to achieve appropriate vibration levels with the future rail infrastructure in place. The point of evaluation is defined as 5 to 10 m from the building foundation in a direction parallel to the tracks.

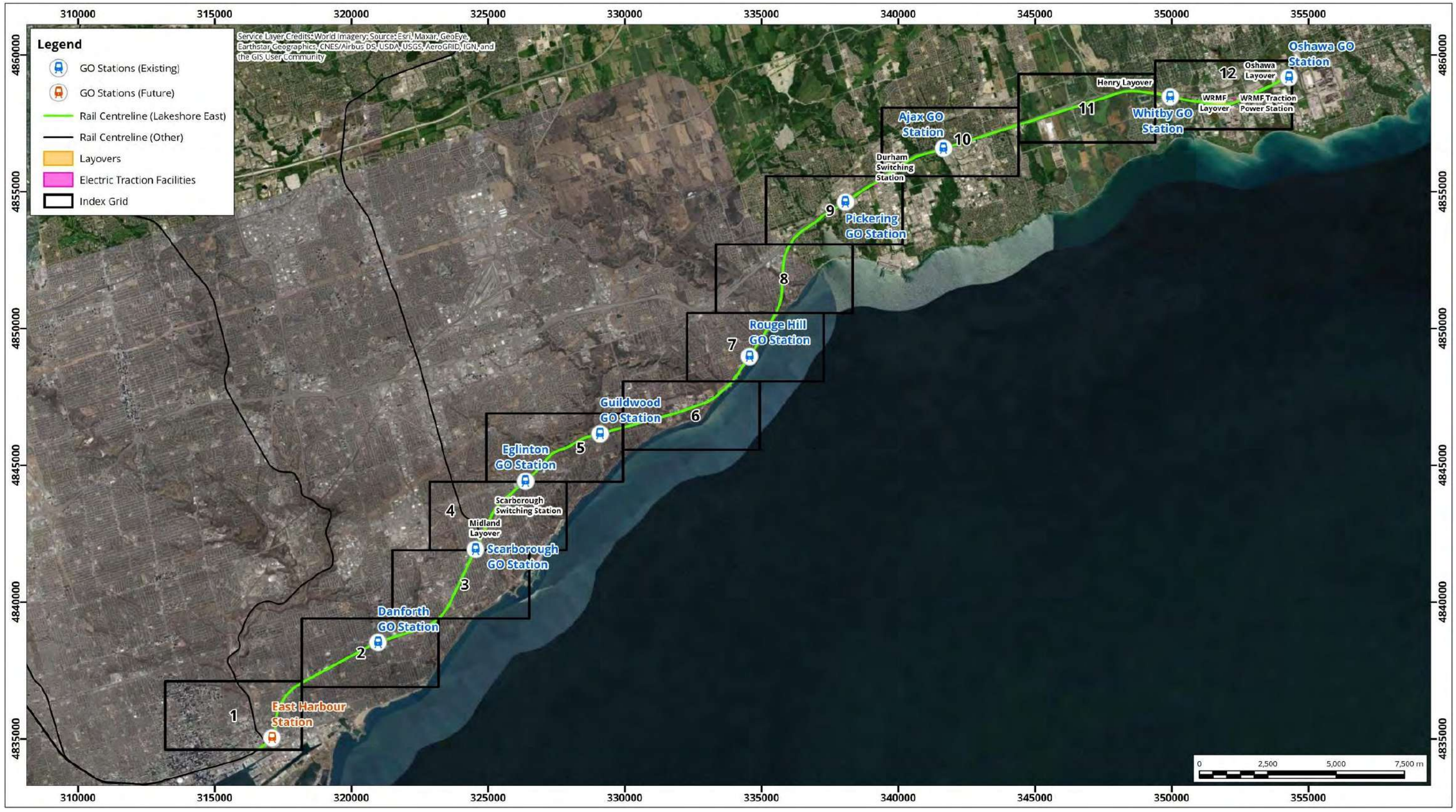

FIGURE 3-32: LAKESHORE EAST NOISE & VIBRATION STUDY AREA

TABLE 3-55: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS - CARLAW AVENUE TO EGLINTON GO

Track Section	Receptor ID[1]	Figure[64]	Description	Receptor Distance from Nearest Track (m)
Carlaw Ave to Danforth GO	R007	D.1.1	Single Detached Dwelling	50
	R008	D.1.1	Single Detached Dwelling	70
	R009	D.1.1	Single Detached Dwelling	40
	R010	D.1.1	Single Detached Dwelling	40
	R011	D.1.2	Single Detached Dwelling	90
	R012	D.1.2	Single Detached Dwelling	20
	R013	D.1.2	Single Detached Dwelling	30
	R014	D.1.2	Single Detached Dwelling	40
	R015	D.1.2	Single Detached Dwelling	20
	R016	D.1.2	Single Detached Dwelling	30
	R017	D.1.2	Single Detached Dwelling	30
	R018	D.1.2	Single Detached Dwelling	30
	R019	D.1.2	Single Detached Dwelling	40
	R020	D.1.2	Single Detached Dwelling	30
	R021	D.1.2	Townhouse	20
Danforth GO to Scarborough GO	R022	D.1.2	Townhouse	40
	R023	D.1.2	Single Detached Dwelling	70
	R024	D.1.2	Single Detached Dwelling	40
	R025	D.1.2	Single Detached Dwelling	40
	R026	D.1.2	Single Detached Dwelling	80
	R027	D.1.2	Single Detached Dwelling	30
	R028	D.1.2	Single Detached Dwelling	40
	R029	D.1.2	Single Detached Dwelling	40
	R030	D.1.3	Single Detached Dwelling	30
	R031	D.1.3	Single Detached Dwelling	30
	R032	D.1.3	Single Detached Dwelling	40
	R033	D.1.3	Single Detached Dwelling	40
	R034	D.1.3	Single Detached Dwelling	90
	R035	D.1.3	Single Detached Dwelling	90
Scarborough GO to Eglinton GO	R036	D.1.4	Townhouse	50
	R037	D.1.4	Townhouse	40
	R038	D.1.4	Single Detached Dwelling	100
	R039	D.1.4	Condominium	120
	R040	D.1.4	Townhouse	40
	R041	D.1.4	Single Detached Dwelling	20
	R042	D.1.4	Single Detached Dwelling	350
	R043	D.1.4	Single Detached Dwelling	240
	R044	D.1.4	Single Detached Dwelling	50

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

[64] Figures referenced are included in **Appendix G6.**

TABLE 3-56: NOISE RECEPTOR LOCATIONS AND DESCRIPTIONS - EGLINTON GO TO OSHAWA GO

Track Section	Receptor ID[1]	Figure[65]	Description	Receptor Distance from Nearest Track (m)
Eglinton GO to Guildwood GO	R045	D.1.5	Single Detached Dwelling	50
	R046	D.1.5	Townhouse	60
	R047	D.1.5	Single Detached Dwelling	80
	R048	D.1.5	Single Detached Dwelling	80
Guildwood GO to Rouge Hill GO	R049	D.1.5	Single Detached Dwelling	40
	R050	D.1.5	Single Detached Dwelling	40
	R051	D.1.5	Single Detached Dwelling	70
	R052	D.1.6	Single Detached Dwelling	130
	R053	D.1.6	Single Detached Dwelling	40
	R054	D.1.6	Single Detached Dwelling	60
	R055	D.1.7	Single Detached Dwelling	70
Rouge Hill GO to Pickering GO	R056	D.1.7	Single Detached Dwelling	40
	R057	D.1.7	Single Detached Dwelling	60
	R058	D.1.8	Single Detached Dwelling	30
	R059	D.1.8	Single Detached Dwelling	50
	R060	D.1.8	Single Detached Dwelling	80
	R061	D.1.9	Single Detached Dwelling	60
	R062	D.1.9	Single Detached Dwelling	50
	R063	D.1.9	Single Detached Dwelling	240
Pickering GO to Ajax GO	R064	D.1.9	Townhouse	130
	R065	D.1.9	Single Detached Dwelling	160
	R066	D.1.10	Single Detached Dwelling	300
	R067	D.1.10	Single Detached Dwelling	150
Ajax GO to Whitby GO	R068	D.1.10	Single Detached Dwelling	110
	R069	D.1.10	Single Detached Dwelling	100
	R070	D.1.10	Single Detached Dwelling	190
	R071	D.1.11	Single Detached Dwelling	150
	R072	D.1.11	Single Detached Dwelling	170
Whitby GO to Oshawa GO	R073	D.1.12	Single Detached Dwelling	60
	R074	D.1.12	Single Detached Dwelling	1050

Notes: [1] Each receptor was assessed at two locations, daytime was assessed outdoors at a height of 1.5 m above grade, and nighttime was assessed on the façade at a height of 4.5 m above grade.

[65] Figures referenced are included in **Appendix G6.**

Existing noise barriers are defined as barriers built as of August 2019 or planned barriers identified during Environmental Assessments completed prior to August 2019. Existing barriers do not include barriers triggered by the 2017 Electrification EPR. Existing barriers were included in the Pre-project, and Post-project modelling scenarios. A number of the existing barriers on the LSE Corridor are located at receptors where the Rail Corridor is adjacent to Highway 401. These barriers are designed to protect receptors from noise from Highway 401, but also provide shielding for noise from the Rail Corridor. The replacement of existing or planned noise barriers located on the Metrolinx Right-of-Way was not considered in this assessment. Mitigation was therefore not investigated in locations with existing or planned barriers. However, filling in of gaps between existing noise barriers and horizontal extensions of these barriers were investigated, subject to technical and economic feasibility.

3.7.8 Visual

Please see **Appendix H** for a copy of the Visual Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.7.8.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.8.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.8.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

The Midland Layover is proposed east of Scarborough GO Station, near Midland Avenue and Brimley Road in the City of Toronto (see **Figure 3-33**). The surrounding properties are primarily parks/open space, condominiums, and residential homes. This layover facility is required to reduce congestion on the rail corridor, minimize non-revenue travel by being near major GO Stations (including Scarborough GO and Eglinton GO Stations), and service the Lakeshore East corridor by storing trains during off-peak hours. The facility is anticipated to consist of storage for five (5) trains within Metrolinx's existing rail ROW and is to be electrified. The facility's components include storage areas for rolling stock and maintenance equipment, staff parking, an access road, lightning, OCS and a switching station (previously approved as part of the 2017 GO Rail Network Electrification EPR).

This EPR Addendum assesses the anticipated visual impacts and presents associated mitigation for the Electrification of the Midland Layover Facility only. Please refer to the Scarborough Junction Grade Separation EPR for a full assessment of the potential visual impacts of the Midland Layover.

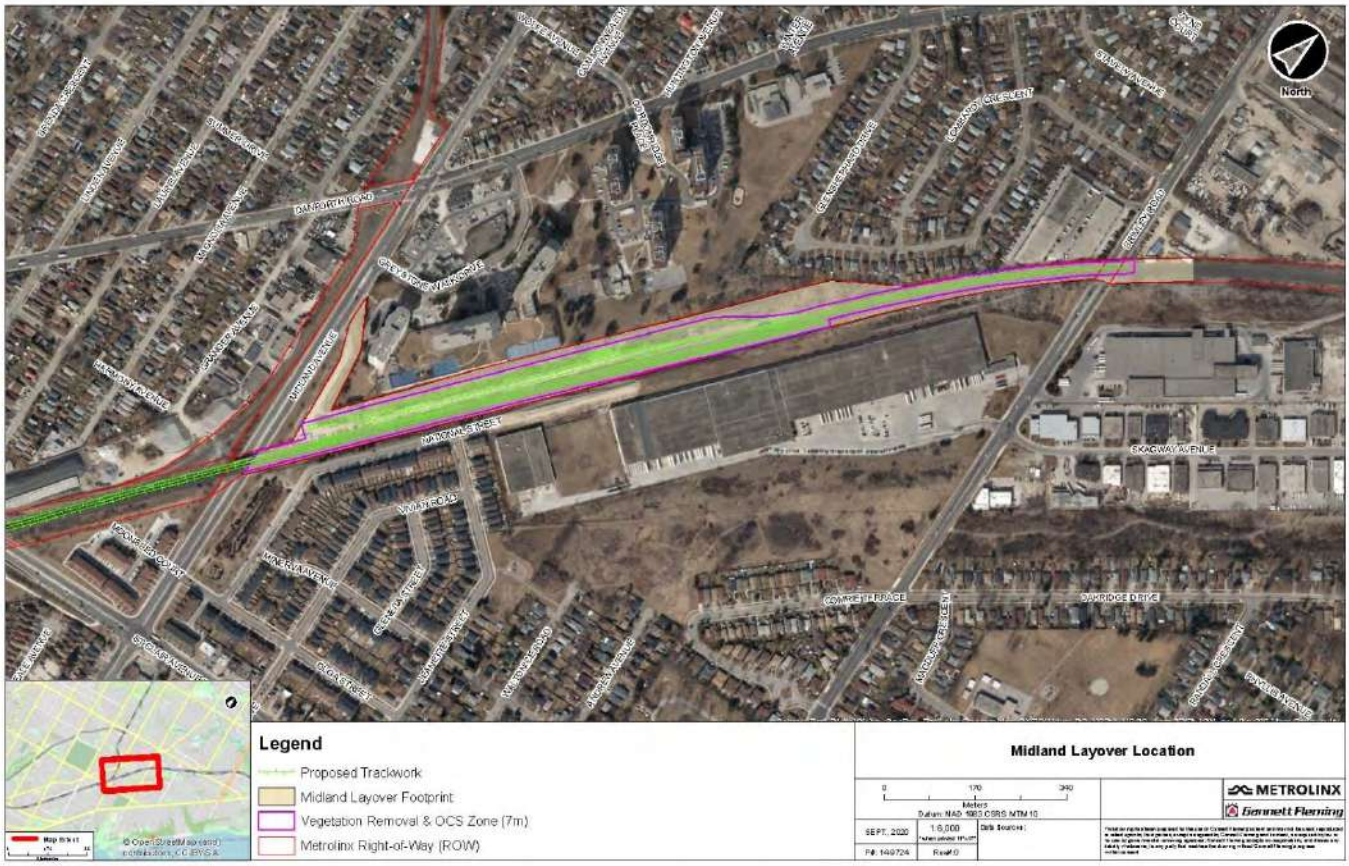

FIGURE 3-33: PROPOSED MIDLAND LAYOVER LOCATION, LAKESHORE EAST CORRIDOR (CITY OF TORONTO)

As the general visual characteristics of the area is urban/suburban with a small amount of parkland. The area has a high level of topography, with no prominent visible natural features. The rail corridor crosses Danforth Road at grade just west of Midland Avenue. Single family residences are located north and west of the crossing. Several residential towers are located east of the crossing, while a light industrial area is located to the south. Vegetation provides some screening of the rail tracks to residences located to the west of the rail corridor; however, the rail corridor is visible to residential towers with westward views.

This segment also traverses a mixture of single-family and high-rise housing interspersed with *Employment* and *Mixed Use* buildings in Toronto. The backyards of many of the houses abut the rail corridor more than 20 metres from the ROW. While there are several high-rise residential complexes in this section, they are located more than 100 metres away from the ROW. Views from the upper floors will likely not change in a meaningful way (see **Figure 3-34**).

FIGURE 3-34: AERIAL VIEW OF PROPOSED INFRASTRUCTURE NEAR EGLINTON GO STATION (LOOKING NORTH) [66]

New storage and reversal pocket track is proposed within the existing Metrolinx rail ROW. The potential operational uses of such infrastructure suggests minimal changes to the existing views in the area (see **Figure 3-35** and **Figure 3-36**); thus the baseline conditions in this segment are categorized as *Negligible*.

[66] New and upgraded track infrastructure from the NT&F TPAP is depicted in orange.

FIGURE 3-35: EGLINTON GO STATION NORTH PARKING LOT (LOOKING EAST)

FIGURE 3-36: EGLINTON GO STATION SOUTH PARKING LOT (LOOKING NORTHWEST)

3.7.8.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.8.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.8.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.8.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.8.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

In this section, the rail corridor passes through the Town of Whitby and the City of Oshawa. The land use on both sides of the Rail ROW are categorized as Open Space or Large-Scale Industrial.

The Oshawa GO Station has a large parking lot north of the rail corridor and a freight rail yard south of the station (see **Figure 3-37**). The track upgrades are proposed to occur within the existing ROW; therefore, views from the Oshawa GO Station and surrounding areas are not expected be altered. Based on this, the baseline conditions in this segment are categorized as Negligible.

Thickson Road Bridge is intended to be expanded/widened to the north to accommodate a new third track in this segment of the Lakeshore East Rail Corridor. The views of the bridge are categorized as Negligible, as the visual profile of the bridge is not anticipated to change significantly (see **Figure 3-38**).

Additionally, the surrounding area consists of *Commercial* and *Industrial* uses, which are categorized as having a *Negligible* visual effect due to the intended use/activity in the area.

FIGURE 3-37: OSHAWA GO STATION

FIGURE 3-38: VIEW OF THE EXISTING THICKSON ROAD BRIDGE, LOOKING SOUTH

3.7.9 Utilities

Please see **Appendix I** for a copy of the Utilities Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.7.9.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.9.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.9.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

Utility realignments will be required where conflicts occur with existing utilities. There is one unknown utility alignment within the rail ROW at the Midland Layover location.

3.7.9.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.9.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.9.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.9.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.9.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

3.7.10 EMI & EMF

Please see **Appendix J** for a copy of the EMI & EMF Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.7.10.1 EMI Sensitive Sites

Based on the baseline mapping for the Lakeshore East Corridor, no EMI sensitive sites were identified within Zone 3 or closer (i.e., less than 100 metres from the closest track) or between 100 metres and 250 metres (the conservative evaluation zone) from the Lakeshore East Corridor.

3.7.10.2 ELF EMF Measurements

The tables in Section 4.2.7.2 to Section 4.2.7.10 in the 2017 Electrification EMI/EMF Baseline Conditions Report (Appendix J1 of the 2017 EPR) present the ELF EMF measurements at select points along the Lakeshore East Corridor. There were no high-ELF (> 10 mG) areas along this corridor, and so there are no locations where post-electrification measurement of ELF EMF is recommended.

3.7.11 Stormwater Management

Please see **Appendix K** for a copy of the Preliminary Stormwater Management Report, which details the baseline conditions assessment completed for this discipline.

3.7.11.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.11.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.11.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

For a more detailed discussion regarding anticipated Stormwater Management impacts and applicable mitigation measures at the proposed Midland Layover Facility, please refer to the 2020 Scarborough Junction Grade Separation EPR.

3.7.11.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.11.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.11.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.11.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.11.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

3.7.12 Groundwater and Wells

Please see **Appendix L** for a copy of the Hydrogeological Assessment Report, which details the baseline conditions assessment completed for this discipline.

3.7.12.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.12.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.12.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

SPPs have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater WHPA and surface water IPZ. This study area falls within the IPZ-2 intake protection zone within the Toronto SPA.

With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. Nearby waterbodies and watercourse may also have an influence on the observed gradients in the case of LSE-3 (Lake Ontario) due to the surface water level fluctuations. This data does not reflect groundwater patterns in deeper aquifers. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-57** below.

TABLE 3-57: SECTION LSE-3 - SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
LSE	LSE-3	2 – 2	0.054	northwest

This section of the study is within the network of the Highland Creek Sub-watershed. Urban land uses comprise 100% of the watershed. The mean annual flow near the mouth is about 35 mm^3/yr, with waters primarily originating from runoff (TRCA, 1999).

The TRCA considers surface water quality in this watershed poor due in part to E.coli and phosphorous concentrations. Little change is noted in water quality over the past five years; however, limited surface water quality results are available.

The surface water quality in the Rouge River Sub-watershed is generally considered clean with no significant parameters of concern (TRCA, 2007). Phosphorus levels have decreased; however, as a result of increased urbanization, chloride levels have increased over the decade.

There was one (1) industrial/commercial supply well identified within 500 metres of this section of the rail corridor. This section is characterized by an urban setting and the use of private water wells is likely negligible. There was one (1) waterbody, West Highland Creek, located within 500 metres of the rail corridor.

No wetland features exist within this section of the study area.

3.7.12.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.12.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.12.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.12.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

3.7.12.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

SPPs have been implemented throughout the region to protect drinking water resources. These SPPs include groundwater WHPA and surface water IPZ. The regional physiography in this area is defined as Iroquois Plain with the surficial geology at LSE-8 described as having soils that are stone-poor, silty to sandy tills of low permeability and fine-grained soils overlying the till which are massive and well laminated. East of Forbes Street is an area where modern alluvial deposits exist within a creek valley (Chapman and Putnam, 1984). LSE-8 is not located within a WHPA or IPZ, but is located within the Central Lake Ontario SPA.

With groundwater flow patterns, the water table fluctuates seasonally by two-to-three metres. The water table occurs at two metres below ground surface (mbgs) or shallower in all study areas. Nearby waterbodies and watercourse may also have an influence on the observed gradients in the case of LSE-8 (Lake Ontario) due to the surface water level fluctuations. This data does not reflect groundwater patterns in deeper aquifers. Groundwater depths and maximum horizontal gradients have been provided in **Table 3-58** below.

TABLE 3-58: SECTION LSE-8 - SUMMARY OF WATER TABLE DEPTHS AND HORIZONTAL GRADIENTS

Corridor	Study Area	Groundwater Depth Range (mbgs, +/- 2 metres)	Maximum Horizontal Gradient (m/m)	Gradient Direction
LSE	LSE-8	2 – 8	0.072	southwest

This section of the study is within the network of the Corbett Creek Sub-watershed. The Corbett Creek watershed is managed by CLOCA. Neighboring watersheds include the Pringle Watershed to the west and Whitby Watershed to the east.

According to the 2017 Electrification assessment along this segment of corridor, there were four (4) domestic supply wells identified within 500 metres in this section of the rail corridor. This section is characterized by an urban setting and the use of private water wells in this area is likely negligible. There were five (5) waterbodies: Pringle Creek, tributary of Corbett Creek, Corbett Creek, Whitby Harbour Wetland Complex and Corbett Creek Coastal Wetland Complex, located within 500 metres of the rail corridor.

4 Impact Assessment

4.1 Approach, Methodology and Organization

This section summarizes the results of the various impact assessment studies that were undertaken as part of the GO Rail Network Electrification Significant EPR Addendum (refer to Appendices A – L for further details) to address additional electrification infrastructure required as part of the revised OCS Impact / Vegetation Clearance Zone, as well as the USRC Hydro One Conflicts. Conceptual Electrification Corridor Plans were generated that present the study area examined as part of this Addendum in comparison to the original footprint documented as part of the 2017 EPR (refer to **Appendix N)**.

The baseline conditions information contained in Section 3 was used as the basis from which the potential effects of the GO Rail Network Electrification Project Addendum was evaluated. Based on the conceptual engineering design developed for the Project, an impact analysis approach was taken which involved the following steps:

Step 1 – Identify potential effects (positive and negative) resulting from the construction and/or operation of the Project infrastructure;

Step 2 – Establish avoidance/mitigation/compensation measures to eliminate or minimize potential negative effects (as required);

Step 3 – Carry out consultation with public/stakeholders/regulatory authorities; update impact assessment results and/or proposed avoidance/mitigation/compensation mitigation measures as appropriate; and

Step 4 – Document impact assessment results.

For purposes of differentiating the various types of potential environmental effects related to the GO Transit Rail Network Electrification Project, they were characterized and grouped by discipline as follows:

TABLE 4-1: POTENTIAL ENVIRONMENTAL IMPACTS

Footprint Impacts	Potential displacement or loss of existing environmental features within the Project study area due to the implementation of the physical Electrification and Hydro One Project components/infrastructure.
Operations and Maintenance Impacts	Potential longer term effects due to operation of the electrified GO Transit network and Hydro One infrastructure within the USRC.
Construction Impacts	Potential shorter term effects due to construction activities associated with the Electrification and Hydro One Project components/infrastructure.

Following identification of potential impacts, mitigation measures were identified (if required) based on a combination of best management practices and development of Project specific mitigation measures, as appropriate.

With this process in mind, the following subsections document the impact assessment carried out with respect to natural, social, and cultural environmental factors:

- **Natural Environment Factor:**
  - Terrestrial Features (i.e., vegetation, wildlife/wildlife habitat, etc.)
  - Aquatic Features (i.e., surface water, fish/fish habitat)
  - Hydrological Features (i.e. groundwater and wells)
  - Preliminary Environmental Site Assessment

- Stormwater Management

- **Cultural Environment Factor:**
  - Built Heritage Resources and Cultural Heritage Landscapes
  - Archaeological Resources

- **Social Environment Factor (including Built Environment):**
  - Land Use/Socio-Economic Features
  - Air Quality
  - Noise & Vibration
  - Visual/Aesthetics
  - Utilities

- **Other**
  - Electromagnetic Fields
  - Electromagnetic Interference

For further details regarding the specific methodologies followed for each technical discipline, please refer to the reports contained in **Appendices A to L**. A summary of the assessment methodology for noise and vibration is included in Section 4.1.1, while a summary of the methodologies for the regional and local air quality assessments have been included in Section 4.1.2 and Section 4.1.3 respectively. In addition, a summary of property related effects including acquisitions and easements has been included in Section 2.3.

4.1.1 Noise and Vibration Assessment Methodology

4.1.1.1 Background – GO Rail Network Electrification TPAP (2017)

Since the completion of the GO Rail Network Electrification TPAP in December 2017, Metrolinx developed a more advanced design for how increased passenger service will be delivered through GO Expansion, which involved further infrastructure and rail traffic changes. These changes necessitate a reassessment of potential impacts; specifically, the 2017 plans did not anticipate certain service expansions and realignments, new stations and layover sites that are part of Metrolinx's future plans. These proposed changes require a reassessment of potential noise and vibration effects (and consideration of associated mitigation measures) which are being captured as a component of this EPR Addendum.

Existing and predicted future sound and vibration levels associated with these changes were used to assess potential effects, in accordance with the applicable guidelines. In areas where potential effects were found to be above the applicable guidelines, mitigation options were investigated and recommendations were provided.

4.1.1.2 Assessment Approach

The methodology for noise and vibration studies for Metrolinx rail infrastructure projects as part of a TPAP follows guidance provided in the "Protocol for Noise and Vibration Assessment" in December 1995 (the "MOEE/GO Protocol"). For the work associated with the GO Rail Network Electrification Project, Metrolinx developed an internal document entitled, "Work Plan: Noise and Vibration Impact Assessment for the GO Expansion OnCorr Project" (Metrolinx Work Plan). This document describes in detail the scope and approach for the current work and provides information that compliment the approach of the MOEE/GO Protocol. Notably, the Metrolinx Work Plan describes a detailed methodology for assessing proposed noise barriers according to administrative, operational, economic and technical criteria, which the MOEE/GO Protocol refers to but does not define in detail.

Overall, the methodology used in the assessment of sound and vibration effects related to this project is based on numerical modelling and the comparison of sound and vibration levels between an existing scenario (or baseline) and a future scenario after implementation of the project and associated increases in rail traffic. Measurements of sound and vibration levels can be used to inform the modelling, (e.g., to confirm sound and vibration emissions from train wheels impacting a rail switch), but the assessment itself is based on a comparison of sound and vibration levels predicted by modelling both existing and future scenarios (i.e., a consistent model-to-model comparison).

Following the MOEE/GO Protocol, the assessments of sound and vibration effects are based on the difference in predicted levels from existing to future scenarios. When defined thresholds are reached or exceeded, this triggers the investigation of possible mitigation. For sound levels, this threshold is a predicted 5 dB increase in average sound levels relative to existing levels or MECP noise exposure objectives, whichever are higher, at nearby points of reception (i.e., residences) as a result of the project. For vibration, the threshold is a predicted 25% or more increase in pass-by RMS vibration velocity relative to existing vibration velocity or 0.14mm/s, whichever is higher, at a point of vibration assessment. Any proposed mitigation for both sound and vibration effects must meet administrative, operational, economic and technical criteria.

Sound mitigation typically involves proposing walls or barriers to block receptors (i.e., houses) from the sound of trains, but can also involve reducing sound levels at the source (e.g., quieter trains) or at the receptor location (e.g., more sound-proof windows). Barriers effectively reduce effects of all rail operations on existing and new tracks. Vibration mitigation typically involves installing technologies such as ballast mats under new rails or switches, which absorb vibration energy and reduce the effects on nearby receptors.

Train schedules representative of the predictable worst-case scenario were developed for the assessments. The Ultimate Capacity schedules were based on the 2037 predicted operations, which were provided by Metrolinx in April 2020. The Ultimate Capacity schedules were developed by modifying the 2037 predicted operations with the following adjustments:

- 2037 predicted volumes were increased by 10% during peak periods;
- The peak period increases would be achieved with diesel trains; and
- Train consists would be locomotive driven not electric multiple units (which are quieter).

The intention of these adjustments was to capture the range of actual scenarios that may be implemented in the future to deliver the required service levels.

Where specific or detailed input data was not available, assumptions were made in a conservative manner. This included things such as:

- Assuming higher train speeds (the track speed limit) where speeds were unknown; and
- Assuming no elevated sound levels from roadways or other industries.

4.1.1.3 Enhancement of Previous Project Assessment Methodology

For this specific EPR Addendum, three significant enhancements to the previous project assessment methodology have been integrated into the new design, compared to the methodology used for the original 2017 EPR:

- Metrolinx has committed to the implementation of a silencer retrofit program on all existing diesel locomotives and silencer installations on any future diesel locomotives, reducing future diesel locomotive sound by 3 dB;
- Where a 5 m barrier is not predicted to achieve the desired noise mitigation objective (typically at least a 5 dB reduction) a maximum barrier height up to 7 m may be considered; and

- More detailed noise mitigation evaluation to assess economic feasibility and constructability of proposed barriers.

4.1.1.4 Model Selection

The MOEE/GO Protocol stipulates the use of a model known as Sound from Trains Environmental Analysis Method (STEAM) for predicting rail traffic sound levels. STEAM was developed by the MECP (MOE, 1990). As a result of consultations with Metrolinx, the noise modelling for the 2017 EPR and for the current assessment deviated from this guidance in that the rail traffic sound levels were modelled using the "Federal Noise and Vibration Impact Assessment" (the "FTA Protocol"; FTA, 2018) and the "Federal Railroad Administration High-Speed Ground Transportation Noise and Vibration Impact Assessment" (the "FRA Protocol"; FRA, 2012).

The FTA and FRA algorithms are included in Cadna/A, a software package used in the assessment. Cadna/A also includes the stationary source algorithms in ISO 9613 (ISO 1994, ISO 1996) used in the assessment.

Although the propagation algorithms of the two models (STEAM and FTA/FRA) are very comparable, the use of the FTA/FRA model in Cadna/A allows for more detailed and comprehensive modelling. Additionally, the outputs of FTA/FRA modelling in Cadna/A are more visual and thus more effective for presentation to the stakeholders. Further details regarding the implications of using of FTA/FRA in lieu of STEAM are outlined in the GO Rail Network Electrification EPR (Metrolinx, 2017).

4.1.1.5 Adjusted Noise Impacts

The sound from rail-related operations, layover sites and traction power facilities are each assessed against different criteria. All of the criteria used in this assessment are equivalent sound levels (L_{EQ}) over time periods varying from 1 hour to 16 hours. The equivalent sound level reflects the average exposure to sound over a specified time period and is considered to be a good, single number descriptor of human response to sound. The instantaneous maximum sound level that would be experienced from a train pass-by is not assessed against these criteria, but its effect is included in the L_{EQ}. Refer to **Appendix G** for further details regarding assessment methodology.

Rail Operations

The MOEE/GO Protocol states that effects from sound at a receptor shall be expressed in terms of the Adjusted Noise Impact. The Adjusted Noise Impact is based on the difference between the objective and Post-project noise (i.e., including ambient sound and sound from Post-project rail). In the context of this assessment, the Post-project noise is the future scenario with the implementation of new rail infrastructure and Ultimate Capacity traffic volumes.

According to the MOEE/GO Protocol, the Adjusted Noise Impacts associated with the rail operations shall be rated with respect to the objectives as follows:

- Insignificant: Adjusted Noise Impacts between 0 and 2.99 dB;
- Noticeable: Adjusted Noise Impacts between 3 and 4.99 dB;
- Significant: Adjusted Noise Impacts between 5 and 9.99 dB; and
- Very significant: Adjusted Noise Impacts above 10 dB.

In cases where the Adjusted Noise Impact at a receptor is considered "Significant" or "Very significant", the potential to mitigate the sound levels shall be evaluated, and mitigation solutions (i.e., typically noise barriers) shall be assessed based on administrative, operational, economic and technical criteria. Where all criteria are met, the mitigation solutions will be recommended. At the detailed design stage, recommended barriers should also be re-evaluated on the basis of these criteria.

Electric Traction Power Facilities

Electric traction power facilities (TPFs) are stationary sources and are subject to the MECP environmental noise guideline, NPC-300 (MECP, 2013). TPFs, which include traction power substations, paralleling stations, and switching stations that were previously approved as part of the 2017 GO Rail Network Electrification TPAP were included in this updated assessment. Sound received at receptors due to TPFs shall not exceed the higher of:

- The exclusion (default) limit values for L_{EQ} (1-hr); or
- The minimum background sound levels that occurs near a receptor.

NPC-300 has default limit values for outdoor receptors and bedroom plane window receptors in Class 1 Areas (i.e., urban areas), Class 2 Areas (i.e., suburban areas) and Class 3 Areas (i.e., rural areas). For outdoor receptors, the default limits by time period are defined in NPC-300:

- 50 dBA during the daytime and evening, 0700-2300h.

For the bedroom plane of window receptors, the default limits are:

- 50 dBA during the daytime and evening, 0700-2300h; and
- 45 dBA during the nighttime, 2300 – 0700h.

Layover Facilities

Idling at layover sites, which are areas dedicated for daytime “off-peak” and overnight train storage, is subject to the MOEE/GO Protocol. Sound received at receptors due to layover sites shall not exceed the higher of:

- The default limit of 55 dBA for L_{EQ} (1-hr); or
- The minimum L_{EQ} (1-hr) background sound level that occurs near a receptor.

4.1.2 Regional Air Quality Study Methodology

The regional air quality study compared network-wide air contaminant emissions from the future train service schedules to network-wide emissions from baseline GO Transit rail operations in 2015 (the baseline established in the 2017 EPR). Metrolinx also retained Rowan Williams Davies & Irwin Inc. (RWDI) to conduct assessments of air quality effects at a local scale throughout the relevant portions of the network. That work is reported in a separate report for each corridor. Local air quality studies were completed only for corridors where diesel locomotive traffic was expected to increase and nearby receptors impacted by the increased emissions. While diesel service levels will remain the same or decrease (with electric train service taking up the planned increased service levels), there will be an increase in the number of diesel locomotives operating on some corridors. This is due to the need to power diesel trains with two locomotives rather than one during peak periods. Corridors with increased diesel train traffic include LSE, KIT, USRC and RH. For all other corridors, increased service levels will be achieved by adding electrified trains and diesel train traffic levels will either remain the same or decrease in future.

Criteria Air Contaminants (CACs) and Greenhouse Gases (GHGs) considered for the regional air quality study include:

- Carbon monoxide (CO)
- Nitrogen oxides (NO_X)
- Respirable Particulate Matter with a diameter of 2.5 micrometres or less ($PM_{2.5}$)
- Carbon dioxide equivalents (CO_{2e})

The study scope includes six Metrolinx-owned Rail Corridors[67]. The study will exclude all other rail activity and corridors in the network. The six corridors included in the scope are:

- Union Station Rail Corridor - From Union Station to Don River
- Lakeshore West Rail Corridor (including the Canpa Subdivision); From Strachan Avenue to approximately 1 km west of Burlington GO Station;
- Kitchener Rail Corridor (From the UP Express Pearson International Airport Spur to Bramalea GO Station;
- Barrie Rail Corridor; - From Parkdale Junction (off Kitchener Corridor) to Allandale Waterfront GO Station;
- Stouffville Rail Corridor; From Scarborough Junction north to Lincolnville GO Station; and
- Lakeshore East Rail Corridor; From just east of the Don River to Oshawa GO Station.

4.1.3 Local Air Quality Study Methodology

In general, the methodology of the operational air quality assessment followed what has been described in detail in the Metrolinx document: “ON Corridor Air Quality and Greenhouse Gas Emissions Study” (Draft #3, September 5, 2019) (Work Plan). Where appropriate, details of the assessment also took into consideration elements of methodologies outlined in the following guidelines:

- Ministry of Transportation Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Project (October 2019); and
- PM Hot-spot Analyses: Guidance (US EPA-420-B-15-084, November 2015).

Metrolinx provided pertinent information, such as baseline and future train volumes, trip log data including throttle and speed profiles, and track diagrams, for incorporation within this assessment. Where specific or detailed input data was not available, assumptions were made in a conservative manner.

The study methodology consisted of a computer simulation technique known as dispersion modelling, which simulates emissions from Metrolinx-related emission sources and other significant emission sources in the study area and predicts worst-case concentrations of key air contaminants at receptors in proximity to the rail corridor, for comparison to air quality criteria. This was done for both a baseline scenario (2015) and a future scenario (2025) with proposed infrastructure and service level changes in place.

The air contaminants considered in the local air quality assessment are as follows:

- Carbon monoxide (CO);
- Nitrogen dioxide (NO_2);
- Respirable Particulate Matter ($PM_{2.5}$);
- Inhalable Particulate Matter (PM_{10});
- Benzene (C_6H_6);
- Benzo(a)pyrene (B(a)P) ($C_{20}H_{12}$);
- 1,3-Butadiene (C_4H_6);
- Formaldehyde (CH_2O);
- Acetaldehyde (CH_3CHO); and

[67] The assessment of the Richmond Hill corridor is included within the NT&F TPAP

- Acrolein (C_3H_4O).

These are the key air contaminants associated with diesel combustion.

The local air quality assessment involves predicting maximum concentrations of these contaminants and comparing the concentrations to objectives that have been established either provincially or nationally. The relevant objectives are the Ontario Ambient Air Quality Criteria (AAQC) and the Canadian Ambient Air Quality Standards (CAAQS). **Table 4-2** shows the applicable AAQC and CAAQS objectives.

AAQCs represent desirable concentrations of air contaminants. They are commonly used in environmental assessments. They are not statutory limits. Ontario's regulation dealing with local air quality (O. Reg. 419/05) exempts motor vehicles, including locomotives.

The CAAQS are used by provinces and territories to guide air zone management actions. They are not intended as facility level regulatory standards, and measures mandated to achieve the CAAQS should consider technical achievability, practicality and implementation costs (CCME, 2019).

TABLE 4-2: AIR QUALITY OBJECTIVES

Contaminant	Averaging Period	Objective (µg/m^3)
AAQC		
CO	1 hour	36,200
	8 hours	15,700
NO_2	1 hour	400
	24 hours	200
PM_{10}	24 hours	50
Benzene	24 hours	2.3
	Annual	0.45
Benzo(a)pyrene	24 hours	5.0E-05
	Annual	1.0E-05
1,3-Butadiene	24 hours	10
	Annual	2
Formaldehyde	24 hours	65
Acetaldehyde	24 hours	500
Acrolein	1 hour	4.5
	24 hours	0.4
CAAQS		
NO_2 (2020)	1-hour [1]	119
	Annual [2]	34
NO_2 (2025)	1-hour [1]	83
	Annual [2]	24
$PM_{2.5}$ (2020)	24 hours [3]	27
	Annual [4]	8.8

[1] The 3-year average of the annual 98th percentile daily maximum 1-hour average concentrations.
[2] The average over a single calendar year of all the 1-hour average concentrations.
[3] The 3-year average of the annual 98th percentile of the daily 24-hour average concentrations.
[4] The 3-year average of the annual average concentrations.

Background concentrations of air contaminants were estimated and added to the model-predicted concentrations produced by rail operations and other potentially significant local emission sources included in the model. This provided a prediction of cumulative concentrations of air contaminants.

Background air quality concentrations were estimated using historical air quality monitoring data from provincial and federal air quality monitoring stations that best represent the study area. The resulting background concentrations were used for both the baseline (2015) and future (2025) scenario. Since air contaminant concentrations have declined in Southern Ontario for many years, and are likely to continue to decline in the coming years, the use of these concentrations for the future scenario is considered to be a worst-case approach. From 2008 to 2017, for example, the annual average concentration of NO_2 declined by 22% and the annual average concentration of $PM_{2.5}$ declined by 7% at the Toronto East monitoring station (MECP, 2017). The monitoring stations used to determine background air quality concentrations for the air quality study area can be seen in Appendix B.

For NO_2 and $PM_{2.5}$, the available monitoring data consisted of continuous hourly values. The data allowed for estimating background concentration by hour of day. As background concentrations vary widely from day to day, a 90th percentile concentration was calculated for each hour of the day using 5 years of hourly monitoring data. The resulting background concentrations represented the highest background conditions likely to coincide with maximum predicted concentrations from rail operations. They were used when predicting maximum 1-hour and/or 24-hour cumulative concentrations of NO_2 and $PM_{2.5}$.

For other contaminants, the background monitoring data consisted of intermittent 24-hour samples. The data did not allow for estimating background concentrations by hour of day. Instead, a 90^{th} percentile 24-hour concentration was calculated from 5 years of monitoring data and was used to represent background conditions when predicting maximum 24-hour cumulative concentrations.

When predicting annual average cumulative concentrations, annual average concentrations from the monitoring data were used to represent background conditions.

4.2 Union Station Rail Corridor

An assessment of impacts related to Air Quality and Noise and Vibration operations as a result of increased GO Transit service levels is discussed below. No Air Quality or Noise and Vibration operational impacts are anticipated as a result of the USRC Hydro One Conflicts infrastructure proposed as part of this EPR Addendum.

4.2.1 Air Quality

The assessment of potential air quality effects within this corridor is detailed in **Appendix F2**. A summary of mitigation and monitoring commitments for this section is included **Table 4-129**.

The highest predicted cumulative concentrations at the worst-case air quality receptor, under worst-case meteorological conditions and reasonably worst-case background air quality conditions are summarized in **Table 4-3** (Baseline Scenario) and **Table 4-4** (Future Scenario).

Some of the contaminants are predicted to exceed standards or criteria at the worst-case receptor, as follows:

- 1-hour and 24-hour NO_2 meet the current Ontario AAQC's, but 1-hour and annual average NO_2 do not meet the more recent and more stringent Canadian Ambient Air Quality Standards (CAAQS) in either the Baseline or Future Scenario.
- 24-hour $PM_{2.5}$ meets the CAAQS in both scenarios, but annual average $PM_{2.5}$ does not meet the CAAQS in either the Baseline or Future Scenario.
- 24-hour and annual average Benzo(a)pyrene exceed the provincial AAQCs in both scenarios.
- 24-hour Benzene meets the AAQC in both scenarios, but the annual average Benzene does not in either scenario.

PM_{10}, Acrolein, Carbon Monoxide, Formaldehyde, Acetaldehyde, and 1,3-Butadiene are all predicted to be within the provincial air quality criteria (AAQCs) in both the Baseline and Future Scenario. As mentioned

previously, the AAQCs and CAAQS represent desirable levels, rather than statutory limits. Measures mandated to achieve the CAAQS should consider technical achievability, practicality and implementation costs (CCME, 2019).

Figure 4-1 shows where the worst-case receptors are located for the contaminants that exceed an AAQC or CAAQS. They are either immediately adjacent to the rail corridor or immediately adjacent to the Gardiner Expressway.

Table 4-5 shows the range of predicted cumulative 1-hour concentrations of NO_2 at the 10 representative receptor locations. The maximum/minimum concentrations shown in the table are maximum/minimum values over the 5-year period of the simulation. Similarly, mean values are 5-year mean values. All values in the table include hourly 90th percentile background concentrations.

The table shows that the change in concentration between the Baseline and Future Scenario is generally less than 25%, decreasing at some receptors and increasing at others. **Table 4-5** also shows that, while the maximum concentrations exceed the CAAQS concentration levels, the median values are well below both the 2020 and the 2025 CAAQS levels. Thus, the predicted concentrations are below the desired limits most of the time.

Table 4-6 shows the contributions of Metrolinx-related emission sources and background sources to the average cumulative NO_2 concentrations at the representative receptors. The background concentrations shown in this table are average levels, rather than 90th percentile. The table shows that the average NO_2 concentration is dominated by the background contribution at all receptors, except Receptor 1 in the Baseline Scenario, where the concentration is dominated by the Gardiner Expressway's contribution. Receptor 1 is adjacent to the expressway.

The average contribution of Metrolinx-related emission sources to the cumulative concentrations is small to moderate at all receptors. In the Baseline Scenario, it ranges from less than 10% at receptors 6 and 10, which are distant from the rail corridor, to more than 20% at locations closer to the tracks. In the future scenario, the contribution of Metrolinx-related emission source is somewhat higher – between 10 and 15% at Receptors 6 and 10, to more than 30% at Receptors 7 and 8. While the contribution of Metrolinx-related sources is higher in the Future Scenario than in the Baseline Scenario, the contribution of the Gardiner Expressway is lower. These off-setting effects contribute to the relatively small predicted change in cumulative concentrations between scenarios. The lower contribution from the Gardiner Expressway in the Future Scenario is due to predicted future improvements in tailpipe emissions from on-road vehicles, as older vehicles are gradually replaced by newer, lower-emission vehicles.

Table 4-7 shows the range of predicted cumulative 24-hour concentrations of $PM_{2.5}$ at the representative receptor locations. These predicted concentrations include the 90th percentile background concentration. The data show that the change in $PM_{2.5}$ concentrations between Baseline and Future Scenario is very small - less 21% at all receptors. The predicted 24-hour concentrations are generally far below the 24-hour CAAQS level in both Scenarios.

Table 4-8 shows the contributions of Metrolinx-related emission sources, the Gardiner Expressway and background sources to the predicted average cumulative $PM_{2.5}$ concentrations. The table shows that the contribution of Metrolinx-related emission sources to cumulative $PM_{2.5}$ is very small at all receptors in both scenarios (less than 10% of the total). In the Future Scenario, the 5-year average $PM_{2.5}$ concentration is below the CAAQS for annual average $PM_{2.5}$ at all receptors except Receptor 1, which is adjacent to the Gardiner Expressway.

Table 4-9 shows the individual contributions of Metrolinx-related emission sources, the Gardiner Expressway and background sources to the predicted average cumulative Benzene concentrations. The predicted average concentrations of Benzene are dominated by the background contribution. The contribution from Metrolinx-related emission sources is small. It is less than 20% at all receptors. The overall cumulative Benzene concentration at all receptors undergoes relatively little change (<7%) between the Baseline and Future Scenario.

Table 4-10 shows the same information as **Table 4-9**, but for Benzo(a)Pyrene. The average concentrations are dominated by the contributions from the Gardiner Expressway and Background. The contribution of Metrolinx related sources is very small – less than 8% at all receptors in both the Baseline and Future Scenario. The concentration decreases significantly in the Future Scenario. This is due to predicted future improvements in tailpipe emissions on the expressway, as previously mentioned.

TABLE 4-3: MAXIMUM MODELLED CONCENTRATIONS FOR BASELINE (2015) SCENARIO

Pollutant	Averaging Period	Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criteria
AAQCs [1]				
NO_2	1 hour	211	400	53%
	24 hours	130	200	65%
Acrolein	1 hour	1.60	4.50	36%
	24 hours	0.27	0.4	67%
CO	1 hour	1142	36200	3.2%
	8-hr	1586	15700	10%
PM_{10}	24 hours	36	50	73%
Benzene	24 hours	1.4	2.3	60%
	Annual	0.71	0.45	159%
B(a)pyrene	24 hours	1.1E-03	5.0E-05	2110%
	Annual	2.9E-04	1.0E-05	2939%
Formaldehyde	24 hours	6.2	65	9.5%
Acetaldehyde	24 hours	2.8	500	0.6%
1,3-Butadiene	24 hours	0.12	10	1.2%
	Annual	0.054	2	2.7%
CAAQS [2]				
NO_2	1 hour (2020)	192	119	162%
	1 hour (2025)	192	83	231%
	Annual (2020)	71	34	212%
	Annual (2025)	71	24	301%
$PM_{2.5}$	24 hours	21	27	76%
	Annual	10	8.8	116%

[1] Background levels based on difference between receptor concentration with and without background concentrations in model
[2] Results averaged based on CAAQS averaging periods descr bed in Table 1.

TABLE 4-4: MAXIMUM MODELLED CONCENTRATIONS FOR FUTURE SCENARIO

Pollutant	Averaging Period	Maximum Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criteria
AAQCs [1]				
NO_2	1 hour	220	400	55%
	24 hours	114	200	57%
Acrolein	1 hour	2.6	4.50	58%
	24 hours	0.37	0.4	93%
CO	1 hour	877	36200	2.4%
	8-hr	1420	15700	9%
PM_{10}	24 hours	32	50	64%
Benzene	24 hours	1.5	2.3	66%
	Annual	0.75	0.45	166%
B(a)pyrene	24 hours	4.0E-04	5.0E-05	799%
	Annual	1.3E-04	1.0E-05	1316%
Formaldehyde	24 hours	7.6	65	11.7%
Acetaldehyde	24 hours	4.1	500	0.8%

Pollutant	Averaging Period	Maximum Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criteria
1,3-Butadiene	24 hours	0.10	10	1.0%
	Annual	0.049	2	2.4%
CAAQS [2]				
NO_2	1 hour (2020)	187	119	157%
	1 hour (2025)	187	83	225%
	Annual (2020)	65	34	194%
	Annual (2025)	65	24	274%
$PM_{2.5}$	24 hours	19	27	70%
	Annual	10	8.8	110%

[1] Background levels based on difference between receptor concentration with and without background concentrations in model
[2] Results averaged based on CAAQS averaging periods descr bed in Table 1.

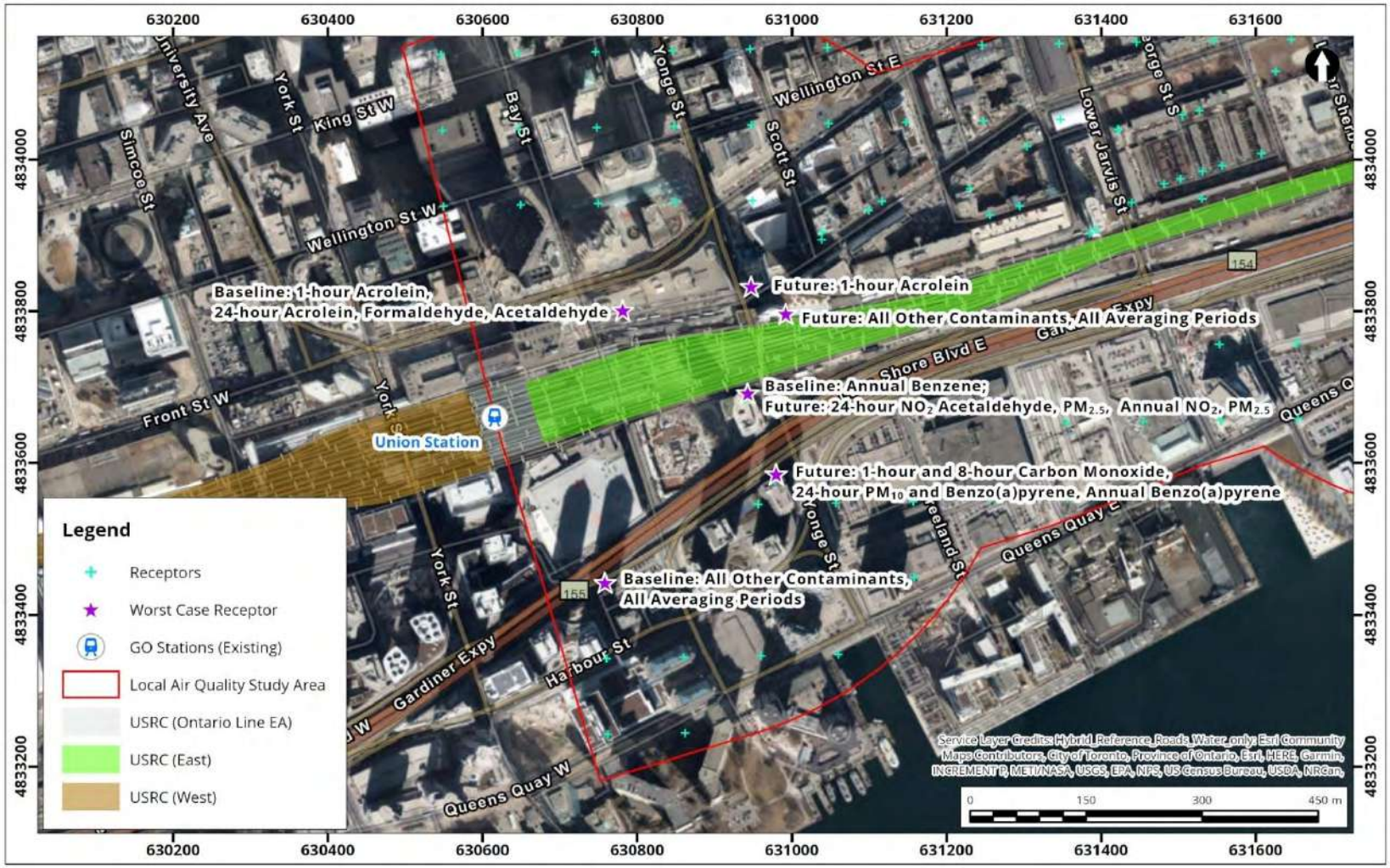

FIGURE 4-1: LOCATION OF WORST-CASE AIR QUALITY RECEPTORS FOR BASELINE AND FUTURE SCENARIOS[68]

[68] USRC West area is not captioned within the scope of this EPR Addendum, and will be assessed as part of a separate Metrolinx undertaking

TABLE 4-5: RANGE OF PREDICTED CUMULATIVE 1-HOUR NO2 AT SELECTED AIR QUALITY RECEPTORS

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	Hourly Concentration (µg/m^3)			
				Maximum	Mean	Median	Minimum
Baseline	1	3	128	266	91	84	34
	2	15	136	193	71	63	34
	3	30	136	175	58	52	34
	4	1.5	283	193	61	54	34
	5	1.5	154	203	71	63	34
	6	1.5	363	166	55	51	34
	7	1.5	195	207	60	52	34
	8	3	17	210	80	71	34
	9	1.5	312	172	56	50	34
	10	1.5	436	163	53	49	34
Future	1	3	128	272	77	66	34
	2	15	136	232	65	55	34
	3	30	136	186	57	51	34
	4	1.5	283	214	58	52	34
	5	1.5	154	199	62	56	34
	6	1.5	363	172	52	50	34
	7	1.5	195	259	63	53	34
	8	3	17	215	76	62	34
	9	1.5	312	173	53	50	34
	10	1.5	436	173	52	49	34
Ontario AAQC				**400 (1-hr), 200 (24-hr)**			
2020 CAAQS				**119 (98th percentile daily max 1-hr)**			
2025 CAAQS				**83 (98th percentile daily max 1-hr)**			

TABLE 4-6: SOURCE CONTRIBUTIONS TO AVERAGE NO2 AT SELECTED AIR QUALITY RECEPTORS

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)			
				Metrolinx-related Sources	Gardiner Expressway	Background	Total
Baseline	1	3	128	9	37	28	74
	2	15	136	9	17	28	54
	3	30	136	7	6	28	41
	4	1.5	283	6	10	28	44
	5	1.5	154	5	22	28	54
	6	1.5	363	3	7	28	38
	7	1.5	195	11	5	28	43
	8	3	17	14	22	28	63
	9	1.5	312	4	7	28	39
	10	1.5	436	3	5	28	36
Future	1	3	128	14	18	28	60
	2	15	136	13	8	28	48

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m³)			
				Metrolinx-related Sources	Gardiner Expressway	Background	Total
	3	30	136	10	2	28	40
	4	1.5	283	9	4	28	41
	5	1.5	154	8	10	28	45
	6	1.5	363	4	3	28	35
	7	1.5	195	16	2	28	46
	8	3	17	21	10	28	59
	9	1.5	312	5	3	28	36
	10	1.5	436	5	2	28	35
2020 CAAQS				**34 (Annual Average)**			
2025 CAAQS				**24 (Annual Average)**			

TABLE 4-7: RANGE OF PREDICTED CUMULATIVE 24-HOUSE PM2.5 AT SELECTED AIR QUALITY RECEPTORS

Scenario	Receptor	Height above Grade (m)	Distance from Tracks (m)	Concentration (µg/m³)			
				Maximum	Mean	Median	Minimum
Baseline	1	3	128	27	18	18	11
	2	15	136	20	17	17	10
	3	30	136	18	16	16	10
	4	1.5	283	19	16	16	10
	5	1.5	154	21	17	17	11
	6	1.5	363	18	16	16	10
	7	1.5	195	19	16	16	10
	8	3	17	22	17	17	10
	9	1.5	312	18	16	16	10
	10	1.5	436	17	16	16	10
Future	1	3	128	22	17	17	10
	2	15	136	19	16	16	10
	3	30	136	17	16	16	10
	4	1.5	283	19	16	16	10
	5	1.5	154	19	16	16	10
	6	1.5	363	17	16	16	10
	7	1.5	195	21	16	16	10
	8	3	17	20	17	17	10
	9	1.5	312	17	16	16	10
	10	1.5	436	17	16	16	10
2020 CAAQS				**27 (98th percentile)**			

TABLE 4-8: SOURCE CONTRIBUTIONS TO AVERAGE PM2.5 AT SELECTED AIR QUALITY RECEPTORS

Scenario	Receptor	Height above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)			
				Metrolinx-related Sources	Gardiner Expressway	Background	Total
Baseline	1	3	128	0.5	2.3	8	10.7
	2	15	136	0.4	0.9	8	9.2
	3	30	136	0.3	0.3	8	8.5
	4	1.5	283	0.2	0.5	8	8.7
	5	1.5	154	0.2	1.1	8	9.3
	6	1.5	363	0.1	0.3	8	8.4
	7	1.5	195	0.4	0.2	8	8.6
	8	3	17	0.6	1.2	8	9.8
	9	1.5	312	0.1	0.3	8	8.5
	10	1.5	436	0.1	0.2	8	8.3
Future	1	3	128	0.7	0.8	8	9.5
	2	15	136	0.6	0.3	8	8.9
	3	30	136	0.4	0.1	8	8.5
	4	1.5	283	0.4	0.2	8	8.5
	5	1.5	154	0.3	0.4	8	8.7
	6	1.5	363	0.1	0.1	8	8.3
	7	1.5	195	0.7	0.1	8	8.8
	8	3	17	0.9	0.5	8	9.4
	9	1.5	312	0.2	0.1	8	8.3
	10	1.5	436	0.2	0.1	8	8.3
2020 CAAQS				8.7 (annual average)			

TABLE 4-9: SOURCE CONTRIBUTIONS TO AVERAGE BENZENE AT SELECTED AIR QUALITY RECEPTORS

Scenario	Receptor	Height above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)			
				Metrolinx-related Sources	Gardiner Expressway	Background	Total
Baseline	1	3	128	0.08	0.12	0.52	0.71
	2	15	136	0.06	0.04	0.52	0.63
	3	30	136	0.05	0.01	0.52	0.58
	4	1.5	283	0.04	0.02	0.52	0.58
	5	1.5	154	0.03	0.06	0.52	0.61
	6	1.5	363	0.01	0.02	0.52	0.55
	7	1.5	195	0.06	0.01	0.52	0.60
	8	3	17	0.08	0.06	0.52	0.66
	9	1.5	312	0.02	0.02	0.52	0.56
	10	1.5	436	0.02	0.01	0.52	0.55
Future	1	3	128	0.11	0.04	0.52	0.67

Scenario	Receptor	Height above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m³)			
				Metrolinx-related Sources	Gardiner Expressway	Background	Total
	2	15	136	0.09	0.01	0.52	0.62
	3	30	136	0.06	0.00	0.52	0.59
	4	1.5	283	0.06	0.01	0.52	0.58
	5	1.5	154	0.05	0.02	0.52	0.58
	6	1.5	363	0.02	0.01	0.52	0.55
	7	1.5	195	0.11	0.00	0.52	0.63
	8	3	17	0.12	0.02	0.52	0.66
	9	1.5	312	0.03	0.01	0.52	0.55
	10	1.5	436	0.03	0.004	0.52	0.55
Ontario AAQC				**0.45 (annual mean)**			

TABLE 4-10: SOURCE CONTRIBUTIONS TO AVERAGE BENZO(A)PYRENE AT SELECTED AIR QUALITY RECEPTORS

Scenario	Receptor	Height above Grade (m)	Distance from Tracks (m)	Annual Average Concentration (ng/m³)			
				Metrolinx-related Sources	Gardiner Expressway	Background	Total
Baseline	1	3	128	0.004	0.320	0.055	0.378
	2	15	136	0.003	0.119	0.055	0.178
	3	30	136	0.002	0.036	0.055	0.093
	4	1.5	283	0.002	0.065	0.055	0.122
	5	1.5	154	0.001	0.152	0.055	0.209
	6	1.5	363	0.001	0.044	0.055	0.100
	7	1.5	195	0.004	0.032	0.055	0.090
	8	3	17	0.004	0.172	0.055	0.231
	9	1.5	312	0.001	0.045	0.055	0.101
	10	1.5	436	0.001	0.032	0.055	0.088
Future	1	3	128	0.005	0.098	0.055	0.158
	2	15	136	0.004	0.037	0.055	0.096
	3	30	136	0.003	0.011	0.055	0.069
	4	1.5	283	0.003	0.020	0.055	0.077
	5	1.5	154	0.002	0.047	0.055	0.104
	6	1.5	363	0.001	0.013	0.055	0.069
	7	1.5	195	0.005	0.010	0.055	0.070
	8	3	17	0.006	0.053	0.055	0.114
	9	1.5	312	0.001	0.014	0.055	0.070
	10	1.5	436	0.001	0.010	0.055	0.066
Ontario AAQC				**0.01 (annual mean)**			

4.2.1.1 Potential Effects and Mitigation Measures

Concentrations of relevant air contaminants were predicted under worst-case meteorological conditions and reasonably worst-case background air quality conditions. This was done for numerous receptor locations, so that the worst-case receptor location(s) could be identified. The analysis was performed for a 2025 horizon year, using rail service levels that were projected to approximately 2037, with a 10% margin of safety applied on top.

Some of the contaminants are predicted to exceed standards or criteria at the worst-case receptor, as follows:

- 1-hour and 24-hour NO_2 meet the current Ontario AAQC's, but 1-hour and annual average NO_2 do not meet the more recent and more stringent Canadian Ambient Air Quality Standards (CAAQS) in either the Baseline or Future Scenario.
- 24-hour $PM_{2.5}$ meets the CAAQS in both scenarios, but annual average $PM_{2.5}$ does not meet the CAAQS in either the Baseline or Future Scenario.
- 24-hour and annual average Benzo(a)pyrene exceed the provincial AAQCs in both scenarios.
- 24-hour Benzene meets the AAQC in both scenarios, but the annual average Benzene does not in either scenario.

As mentioned previously, the AAQCs and CAAQS represent desirable levels, rather than statutory limits. Measures mandated to achieve the CAAQS should consider technical achievability, practicality and implementation costs (CCME, 2019).

Further examination of the model results for NO_2 at representative receptor locations indicated that predicted concentrations change relatively little between the Baseline and Future Scenario (generally less than 25%). Thus, the predicted exceedance of the 1-hour CAAQS is largely unaffected by the Project.

While the predicted hourly NO_2 concentrations exceed the CAAQS levels at a greater frequency than prescribed by the standard, they are, nevertheless, within those levels most of the time. The predicted hourly concentrations in the Future Scenario are below the 2020 CAAQS under 90% of the time at Receptors 1 and 8, which are adjacent to the Gardiner Expressway and the rail tracks, respectively, and more than 90% of the time at all the other representative receptors. They are below the 2025 CAAQS approximately 70% of the time at Receptors 1 and 8, approximately 85% of the time at Receptors 5 and 7, approximately 80% of the time at Receptor 2, and approximately 90% or more of the time at all other representative receptors.

The average contribution of Metrolinx-related emission sources to the predicted cumulative hourly NO_2 concentrations is modest. It is less 40% at all representative receptors, and less than 30% at most, in the Future Scenario.

Further examination of results for $PM_{2\,5}$ showed that the change in cumulative $PM_{2.5}$ concentrations between the Baseline and Future Scenario is very small, and the contribution of Metrolinx-related emission sources to the cumulative $PM_{2.5}$ concentrations is also very small. Thus, like NO_2, the predicted exceedance of the CAAQS for annual average $PM_{2.5}$ is largely unaffected by the Project.

Further examination of the model results for Benzene and Benzo(a)pyrene showed similar findings to those for $PM_{2.5.}$

4.2.2 Noise and Vibration

The assessment of potential noise and vibration effects within this corridor is detailed in **Appendix G1**. **Appendix O1** provides maps showing the locations of receptors and recommended noise and vibration mitigation. A summary of mitigation and monitoring commitments for this section is included in **Table 4-130**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.1.

4.2.2.1 Operational Noise Assessment

The predicted Adjusted Noise Impacts for the project are summarized in **Table 4-11**, and the locations of the "segments" are presented in **Figure 3-10**.

Impact ratings for the evaluated 8 representative receptors listed in the table can be summarised as follows:

- 5 daytime Adjusted Noise Impacts were classified as noticeable (i.e., between 3 dB and 4.99 dB);
- 3 daytime Adjusted Noise Impacts were classified as insignificant (i.e., less than 2.99 dB); and
- 8 nighttime Adjusted Noise Impacts were classified as insignificant (i.e., less than 2.99 dB).

There are no Adjusted Noise Impacts that were classified as significant (i.e., between 5 and 9.99 dB increase) or very significant (i.e., greater than 10 dB increase). The Adjusted Noise Impacts are all predicted to be insignificant or noticeable. Although train volumes in USRC are increasing, the future fleet in USRC is expected to be approximately 50% electric, which are significantly quieter than diesel trains at low speeds. As a result, future sound levels are expected to be lower in the area around Union Station as trains arrive and depart, off-setting the increase in train volumes. As all Adjusted Noise Impacts were predicted to be less than 5 dB, investigation of noise mitigation was not required.

TABLE 4-11: SUMMARY OF ADJUSTED NOISE IMPACTS

Segment	Adjusted Impact Rating[1]	Average Objective [2]		Average Adjusted Noise Impact (dB)		Investigate Mitigation? [4]
		Day[3]	Night[3]	Day[3]	Night[3]	
East of Union Station	Noticeable	64.7	61.7	3.7	-	No
	Insignificant	61.0	58.2	1.7	0.2	

Notes: [1] Ratings are quantified as: Insignificant – Less than 3 dB, Noticeable – 3 dB to 4.99 dB, Significant – 5 to 9.99 dB
[2] The objective is the higher of either the Pre-project sound level or the 55 / 50 dBA default day/night sound levels.
[3] Day is a 16-hour period (i.e., from 0700h to 2300h) and Night is an 8-hour period (i.e., from 2300h to 0700h).
[4] The potential to mitigate is considered when an increase of 5 dB or greater, relative to the objective level, is predicted as per the MOEE/GO Protocol. Such an increase is considered significant (or greater). An Adjusted Noise Impact greater than 5 dB requires the investigation of mitigation.

The predicted sound levels from the Don Yard Paralleling Station was evaluated at nearby receptors and summarized in **Table 4-12**. The predicted sound levels from the electric traction power facility at nearby receptors were below the applicable limits; therefore, no mitigation measures were investigated for the facility.

TABLE 4-12: PREDICTED SOUND LEVELS FROM ELECTRIC TRACTION POWER FACILITY

Electric Traction Power Facility	Receptor ID	Evaluation Location	Period	Predicted Sound Levels	Applicable Limit	Compliance with Applicable Limit
				(dBA)	(dBA)	(Yes/No)
Don Yard Paralleling Station	R08	Plane of Window	Daytime\Evening	42	50	Yes
			Nighttime	42	45	Yes
		Outdoor Area	Daytime\Evening	40	50	Yes

The predicted sound levels from the Post-project layover sites were evaluated at nearby receptors and are summarised in **Table 4-13**. The predicted sound levels for the Post-project scenario at the Don Yard/Wilson Yard Layovers were over the applicable limit of 55 dBA. Therefore, mitigation measures were investigated for these facilities.

TABLE 4-13: PREDICTED SOUND LEVELS FROM POST-PROJECT LAYOVER SITES

Layover	Receptor ID	Evaluation Location	Period	Predicted 1-hr L_{EQ} Sound Levels (dBA)	Applicable Limit (dBA)	Compliance with Applicable Limit (Yes/No)
Don Yard and Wilson Yard Layovers	R08	Outdoor Area	Daytime\Evening	61	55	No
		Façade	Daytime\Evening \Nighttime	61	55	No

Notes: [1] The L_{EQ} is evaluated for any 1 hour period

Along the USRC, the investigation of mitigation was triggered for the layover operations for the Don Yard/Wilson Yard Layovers. Levels were predicted to exceed the 55 dBA limit by up to 7 dB. The noise barrier must achieve a minimum reduction of 5 dB to be considered technically feasible (from an acoustics perspective). To achieve a 5 dB reduction at receptors, a 5 m preliminary noise barrier was modelled at the ROW between the rail and receptors. If the 5 dB reduction was not achieved a 6 m then 7 m barrier was considered.

To achieve the 55 dBA limit at receptors near the layovers, 7 m noise barriers were modelled at the north property line for the Don Yard/Wilson Yard Layovers; the modelling of barriers less than 7 m in height did not achieve the desired noise objective. While the barrier was found to be technically feasible, it was not found to be economically feasible. Mapping of the barrier is included in **Figure G.1.1** in **Appendix G1.**

4.2.2.2 Operational Vibration Assessment

Where sensitive receptors fall within areas of influence where operational vibration levels are expected to exceed the MOEE/GO Protocol vibration limits, mitigation is recommended. Of the 17 switches included in this assessment, 2 triggered assessment of mitigation. Of the approximately 1.6 km of trackwork, none triggered assessment of mitigation. These results are summarized in **Table 4-14**.

Where vibration mitigation is recommended, further evaluation based on administrative, operational, economic and technical feasibility should be completed at the detailed design stage. The recommended vibration mitigation is identified as ballast mats, though consideration of other mitigation options, such as under sleeper pads or resilient fixation can be assessed at the detailed design stage.

TABLE 4-14: SUMMARY OF VIBRATION MITIGATION REQUIRED

New Infrastructure Assessed	Infrastructure ID	Shown in Figure[69]	Mitigation Required?	
Switch	S42	Figure H.1.1	Yes	Townhomes along Henry Ln Terr.
Switch	S44	Figure H.1.1	Yes	Townhomes along Princess St, and Tom Longboat Ln.

4.2.2.3 Potential Effects and Mitigation Measures

Operational Noise Assessment

Adjusted Noise Impacts were found to be insignificant (i.e., less than +3 dB) or noticeable (i.e., between 3 dB and 4.99 dB) for the Union Station Rail Corridor train movements. Therefore, investigation of noise mitigation was not required.

[69] Figures referenced are included in **Appendix G1.**

For electric traction power facilities, the predicted noise levels at nearby receptors were below the limits. Therefore, investigation of noise mitigation for electric traction power facilities was not required.

For layover sites, the predicted noise levels at nearby receptors were above the limits for the Don Yard/Wilson Yard Layover. A noise barrier was investigated at the northern property line across the tracks from the Don Yard/Wilson Yard Layover and found to be economically infeasible.

Operational Vibration Assessment

Predicted vibration effects for both new trackwork and switches were found to exceed the MOEE/GO Protocol limits. Vibration mitigation was recommended for 2 of the 17 new switches. The recommended vibration mitigation is identified as ballast mats, though consideration of other mitigation options, such as under sleeper pads or resilient fixation. Further evaluation of the mitigation options based on administrative, operational, economic and technical feasibility should be completed at the detailed design stage.

4.2.3 Union Station Rail Corridor Hydro One Conflicts

Refer to **Figure 1-5** of this Report for the location of Hydro One Conflicts within the USRC.

4.2.3.1 Natural Environment

4.2.3.1.1 Potential Effects and Mitigation Measures

4.2.3.1.1.1 Terrestrial

Most vegetation within the USRC Hydro One Conflicts study area, specifically the new Don Fleet JCT and the Wilson Yard has been/will be permanently removed during construction of the Wilson Yard, as documented and approved in the 2018 USRC East Enhancements EPR. It is anticipated that any remaining vegetation within the USRC Hydro One Conflicts study area will be impacted during construction. The habitats provide marginal opportunities for foraging and nesting of common urban tolerant resident, migratory birds and common urban mammals. The proposed work will involve clearing vegetation to relocate Hydro One transmission lines to an underground transmission corridor. No permanent net loss of habitat is anticipated.

4.2.3.1.1.1.1 Potential Effects and Mitigation Measures

Prior to undertaking of tree removals, a Tree Removal Strategy, building upon the considerations and elements set out in the Metrolinx Vegetation Guideline (2020), will be developed and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections. If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2020). Metrolinx will adhere to all applicable bylaws for tree removals outside of Metrolinx properties[70]. Pruning of branches will be conducted through the implementation of proper arboricultural techniques. Vegetation removals will also consider and mitigate potential impacts to sensitive species, e.g., migratory birds and Species at Risk (SAR), and features, e.g., Designated Natural Areas and Significant Wildlife Habitat. Metrolinx is committed to continued consultation with the City of Toronto and TRCA.

4.2.3.1.1.2 Aquatic

The Don River Valley is located to the east of the USRC Hydro One Conflicts Study Area. The watercourse provides suitable cover and fish habitat, however, with no visible barriers to disrupt fish movement upstream. The project does not propose any impacts to the Don River and will not require the crossing of any surface waterways, therefore no impacts to aquatic resources are anticipated as a result of the project.

[70] Hydro One is exempt from City of Toronto permitting processes as per the *City of Toronto Act* (2006).

4.2.3.1.1.3 Species at Risk

Based upon the results of background review and agency consultation, the presence of potentially suitable habitat for 6 SAR were identified. During the 2018 review, Barn Swallow and Chimney Swift have been designated as Threatened, and the American Eel has been designated as Endangered under the *Endangered Species Act* (2007) (ESA 2007). The Threatened designation means that although a species is not yet endangered but is likely to become endangered if steps are not taken to address factors threatening the species. The Endangered designation means that a species is facing imminent extinction or extirpation in Ontario.

Threatened and Endangered species and their general habitat are automatically protected and permits or approvals are required for works affecting them. Under *O. Reg 242/08* of the ESA 2007, any proposed activities that result in the removal of SAR habitat requires the submission of a Notice of Activity (NOA).

Common Nighthawk, Eastern Wood-pewee, and Peregrine Falcon which are designated as Special Concern under the ESA 2007. The Special Concern designation means that although a species is not yet endangered or threatened, a combination of biological characteristics and identified threats could endanger or threaten it in the future. Species of Special Concern do not receive formal habitat protections and no permits or approvals are required for works affecting them.

Additionally, it is unlikely for SAR bats to be present within the USRC Hydro One Conflicts study areas because there were no suitable trees identified and the area is largely disturbed from anthropogenic noise due to the active rail. No evidence of SAR bats were observed during the 2018 terrestrial field investigation.

The secondary source review resulted in the following list of SAR as having records occurring within the surrounding landscape of the study area, as shown in **Table 4-15**: below.

TABLE 4-15: SECONDARY SOURCE SAR LIST

Common Name	Scientific Name	Status Under ESA (2007)
Birds		
Barn Swallow	*Hirundo rustica*	Threatened
Common Nighthawk	*Chordeiles*	Special Concern
Eastern Wood-pewee	*Contopus virens*	Special Concern
Peregrine Falcon	*Falco peregrinus*	Special Concern
Chimney Swift	*Chaetura pelagica*	Threatened
Fish		
American Eel	*Anguilla rostrata*	Endangered

The study area contains an abundance of structures suitable for nest construction of Barn Swallow and Chimney Swift (e.g. bridges). Barn Swallow and Chimney Swift have been found in urban populated areas as they nest inside or outside of structures. Additionally, Barn Swallow have been documented throughout the Toronto Port Lands (i.e. located just south of the study area), therefore, it is possible that Barn Swallows and/or Chimney Swifts are nesting within the USRC. Since the USRC is prone to many disturbances (e.g.,

noise), field surveys will be undertaken prior to construction to confirm the number of nests present at the known locations and whether the nests remain active.

Common Nighthawk on the other hand are generally found in open areas with little to no ground vegetation and have been found to nest on the roofs of buildings in urban areas. Marginal habitat for Common Nighthawk may be present along the USRC, however, these areas are highly disturbed by passing trains and human traffic. Additionally, Peregrine Falcons prefer to nest is tall buildings and skyscrapers, which are not present within the USRC. Therefore, it is unlikely that these species would be nesting here.

Potential suitable habitat for Eastern Wood-pewee is present within the USRC in the form of Mineral Cultural Woodland. Since the USRC Hydro One study areas contain no woodlands or large trees (greater than 1m in height), it is considered unsuitable forest for dependent SAR birds, such as the Eastern Wood-pewee.

Records of the American Eel were documented in the Lower Don River in 2014, just beyond but in close proximity to the study area. Eels are tolerant species that are able to hide in burrows, masses of plants, and are found in a variety of habitats, including streams, rivers, and lakes. With no observed barriers, it is likely that the Don River is a migratory route for the species.

Mitigation Measures

No SAR species were confirmed on site during background information review and field investigations. It is very unlikely that Barn Swallow and/or Chimney Swift occur within the study area due to a lack of habitat availability and general disturbances caused by train and human traffic. Therefore, the relocation of Hydro One infrastructure is not expected to result in the loss of nesting habitat for Barn Swallow and/or Chimney Swift. Since none of the proposed works are anticipated to impact the Don River Valley, there are no expected losses of American Eel habitat.

As per the 2018 USRC East Enhancement Natural Environment Report, it is recommended that the MECP be consulted at detailed design to confirm the SAR screening assessment and determine whether an authorization or permit under the ESA 2007 would be required. Although habitat for SAR bats is not anticipated to occur, consultation with the MECP can identify any additional SAR targeted surveys, mitigation and/or compensation measures and monitoring requirements as per the ‘Survey Protocol for Species a Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-coloured Bat’ (MNRF, April 2017).

Additionally, field surveys will be undertaken prior to construction to confirm the number of Barn Swallow nests present at known locations and whether the nests remain active. Where loss or disturbance cannot be avoided (e.g., due to work on bridges or banks), all requirements under the ESA will be met, including any registration, compensation, replacement structures and/or permitting requirements.

If construction activities are scheduled during the nesting season for Barn Swallow (April 1st to August 31st), a nest search will be undertaken by a qualified biologist to confirm that no Barn Swallow are nesting on structures or banks that may be affected by construction activities on or near these areas. If possible, the area will be netted prior to nesting season to dissuade use of these areas for nesting.

If during construction, removal of SAR habitat is determined, a registration of construction activity with the MECP via a NOA in accordance with *O. Reg 242/08* under the ESA 2007 is required.

4.2.3.1.1.4 Designation Areas

Refer to Section 4.2.3.5 below for potential impacts to the Urban River Valley and Natural Heritage System designated areas.

4.2.3.2 Preliminary Environmental Site Assessment

4.2.3.2.1 Potential Effects and Mitigation Measures

The construction and operations of the proposed Hydro One infrastructure could potentially expose contaminated materials and/or result in the spreading of contaminated materials. Therefore, the following mitigation measures are recommended:

- Develop a Soil and Excavated Materials Management Plan for the handling, management and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the work. The plan will be overseen by a Qualified Person pursuant to *Ontario Regulation 153/04* under the *Environmental Protection Act* (QP) and will comply with *Ontario Regulation 406/19* (On-Site and Excess Soil Management – enacted into law on January 1, 2021), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s *Management of Excess Soils: A Guide for Best Management Practices* (April 2019, as amended) and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement, as applicable.
- Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per *Ontario Regulation 347* (as amended) and all Applicable Law.
- The Soil and Excavated Materials Management Plan will be reviewed and approved by Metrolinx prior to construction.
- A Soil and Excavated Material Monthly Dashboard Report will be developed by the Constructor for Metrolinx review that includes monitoring and performance data related to the management of excavated materials for the preceding month.
- Upon completion of the work, the Constructor will submit a Soil and Excavated Material Management Implementation Report to Metrolinx.

4.2.3.3 Cultural Heritage

As previously mentioned in Section 3.2.3.2, a Cultural Heritage Report (CHR) has been prepared to document an inventory of all known or potential built heritage resources (BHRs) and cultural heritage landscapes (CHLs), identified existing conditions of the study area, provided a preliminary impact assessment, and proposed appropriate mitigation measures (see **Appendix C2**).

4.2.3.3.1 Potential Effects and Mitigation Measures

To assess the preliminary impacts of the proposed infrastructure improvements on identified BHRs and CHLs in the study areas, identified resources were considered against a range of possible impacts as outlined by the MHSTCI. Impacts may be positive or negative, direct or indirect, and may affect the property's potential cultural heritage value or interest. Additional factors such as the scale or severity of the impact, whether any changes are temporary or permanent, and if the alterations are reversible or irreversible, should be considered.

Field review confirmed the location of identified BHRs and CHLs, assisted in the identification of known and potential cultural heritage value and heritage attributes, and allowed for the assessment of potential/anticipated impacts of the proposed infrastructure improvements on identified BHRs and CHLs. Of the seven known and potential BHRs and CHLs identified in the Project Study Area, three BHRs will be

both directly and indirectly impacted, and one additional BHR will be subject to indirect impacts only. The two identified CHLs will be neither directly nor indirectly impacted, as shown in **Table 4-16**.

TABLE 4-16: IDENTIFIED BUILT HERITAGE RESOURCES AND CULTURAL HERITAGE LANDSCAPES, PRELIMINARY IMPACT ASSESSMENT, AND RECOMMENDED MITIGATION MEASURES

BHR/CHL Reference Number	Type of Property	Preliminary Impact Assessment	Mitigation Measures
BHR-1	Lower Sherbourne Street Subway	**Direct impacts** are anticipated as a result of the construction of a proposed utility bridge adjacent to the south elevation of this bridge[71]. **Indirect impacts** to the heritage attributes of this BHR are possible due to the proposed works, which may result in limited and temporary adverse vibration impacts to this BHR.	**Direct Impacts:** Preferred Option: Avoid alterations to this bridge. Alternative Option: Should it be determined that there is no other technically feasible option, complete an Heritage Impact Assessment (HIA) to determine appropriate site-specific mitigation measures. **Indirect Impacts:** To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Prior to construction, if it is found that there is potential adverse impacts to this BHR as a result of the vibration zone of influence, a qualified engineer should include this BHR in the condition assessment of structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken.
BHR-2	Parliament Street Subway	**Direct impacts** are anticipated as a result of the construction of a proposed utility bridge adjacent to the south elevation of this bridge. **Indirect impacts** to the heritage attributes of this BHR are possible due to the proposed works, which may result in limited and temporary adverse vibration impacts to this BHR.	**Direct Impacts:** Preferred Option: Avoid alterations to this bridge. Alternative Option: Should it be determined that there is no other technically feasible option, complete an HIA to determine appropriate site-specific mitigation measures. **Indirect Impacts:** To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property.

[71] The utility bridge is to be affixed to the expanded Lower Sherbourne Street Subway bridge, as documented and approved in the 2018 Union Station Rail Corridor East Enhancements EPR.

BHR/CHL Reference Number	Type of Property	Preliminary Impact Assessment	Mitigation Measures
			• Alternative Option: Prior to construction, if it is found that there is potential adverse impacts to this BHR as a result of the vibration zone of influence, a qualified engineer should include this BHR in the condition assessment of structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken.
BHR-3	Cherry Street Subway	**Direct impacts** are anticipated as a result of the construction of a proposed utility bridge adjacent to the south elevation of this bridge. **Indirect impacts** to the heritage attributes of this BHR are possible due to the proposed works, which may result in limited and temporary adverse vibration impacts to this BHR.	**Direct Impacts:** Preferred Option: Avoid alterations to this bridge. Alternative Option: Should it be determined that there is no other technically feasible option, complete an HIA to determine appropriate site-specific mitigation measures. **Indirect Impacts:** To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Prior to construction, if it is found that there is potential adverse impacts to this BHR as a result of the vibration zone of influence, a qualified engineer should include this BHR in the condition assessment of structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken.
BHR-4	Cherry Street Tower	No **direct impacts** to this BHR are anticipated. **Indirect impacts** to the heritage attributes of this BHR are possible due to the proposed works, which may result in limited and temporary adverse vibration impacts to this BHR.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Prior to construction, if it is found that there is potential adverse impacts to this BHR as a result of the vibration zone of influence, a qualified engineer should include this BHR in the condition assessment of structures within the vibration zone of influence. Further, Metrolinx must make a

BHR/CHL Reference Number	Type of Property	Preliminary Impact Assessment	Mitigation Measures
			commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken.
BHR-5	Eastern Avenue Bridge	No **direct** or **indirect impacts** to this property are anticipated as a result of the proposed work.	No further work required.
CHL-1	Distillery District Proposed Heritage Conservation District	No **direct** or **indirect impacts** to this property are anticipated as a result of the proposed work.	No further work required.
CHL-2	Bala Underpass Public Space: Commemorative Plaques and 1856 abutments stones as commemorative features	No **direct** or **indirect impacts** to this property are anticipated as a result of the proposed work.	No further work required.

Based on the results of the CHR, indirect impacts to the heritage attributes of the following PHPs and PHPPS are possible due to the installation of new/modified infrastructure: Lower Sherbourne Street Subway, Parliament Street Subway, Cherry Street Subway (BHR-1, BHR-2 and BHR-3) and the Cherry Street Tower (BHR-4). Therefore, the mitigation measures outlined in **Table 4-16** above should be adhered to, to minimize any potential impacts.

Additionally, direct impacts to the Lower Sherbourne Street Subway, Parliament Street Subway and Cherry Street Subway (BHR-1, BHR-2 and BHR-3), are anticipated as a result of the proposed utility bridges adjacent to the south elevation of each structure. It has since been determined that no other technically feasible options are viable, other than to modify the existing USRC bridges to accommodate the relocation of Hydro One transmission infrastructure (i.e., by attaching the utility bridges to the structures). Therefore, a Heritage Impact Assessment (HIA) is recommended for each USRC bridge to determine appropriate site-specific mitigation measures.

Heritage Impact Assessment Reports (HIAs)

Metrolinx subsequently carried out Heritage Impact Assessments (HIA) for each of the three (3) USRC bridges as follows:

- Heritage Impact Assessment Lower Sherbourne Street USRC Bridge, Toronto (ASI, April 2021)
- Heritage Impact Assessment Parliament Street USRC Bridge, Toronto (ASI, April 2021)
- Heritage Impact Assessment Cherry Street USRC Bridge, Toronto (ASI, April 2021)

The purpose of these HIAs is to assess the potential impacts to each of the three (3) USRC Bridges related to the Project and to recommend appropriate mitigation measures to reduce or eliminate impacts while still enabling the addition of the Hydro One utility bridges. The HIAs are contained respectively in **Appendix C3**, **Appendix C4**, and **Appendix C5**, and contain further information on these built heritage resources and present assessments specific to each structure.

The Lower Sherbourne Street Bridge (Structure 564), the Parliament Street Bridge (Structure 552), and the Cherry Street Bridge (Structure 508) are all located along the USRC between Mile 0.75 to Mile 1.25 in the City of Toronto. The subway bridges carry the USRC over the streets in an east-west orientation, approximately one to two kilometers east of Union Station. The three (3) USRC bridges are each a four-span steel plate girder structure with three riveted steel girder bents and cast-in-place concrete abutments, which were constructed in the late 1920s as part of the Waterfront Viaduct grade separation project. The cast-in-place concrete abutments, wingwalls, and deck fascia feature decorative panel moulding, which is part of the aesthetic of several railway USRC bridges. The three (3) USRC bridges have been identified as PHPs for their significant historical, design, and contextual values (see **Figure 4-2** to **Figure 4-4**).

FIGURE 4-2: SOUTH VIEW OF THE LOWER SHERBOURNE STREET USRC BRIDGE (SUBWAY)

FIGURE 4-3: SOUTH VIEW OF THE PARLIAMENT STREET USRC BRIDGE (SUBWAY)

FIGURE 4-4: SOUTH VIEW OF THE USRC CHERRY STREET BRIDGE (SUBWAY)

Impact Assessment

To assess the potential impacts of the proposed works on the cultural heritage value of the Lower Sherbourne Street, Parliament Street and Cherry Street USRC Bridges, the following heritage attributes identified below, and which have been derived from detailed cultural heritage evaluations of each structure, were considered against a range of possible impacts:

- Attributes related to its historical associations at a local level including:
  - The construction between 1927-1928 as one of four similar Subways in the Waterfront Viaduct, a major City of Toronto initiative to establish a continuous, grade-separated rail line across the southern part of the City.
- Attributes related to its design associations at a local level including:
  - The concrete-encased steel plate girder designs and structural configurations;
  - The precise construction, and excellent overall condition of the built-up steel frame sections; and
  - The concrete abutments and deck fascia: board-formed with elegant falsework panelling and angled returns to the south, all in excellent overall conditions.
- Attributes related to its contextual associations at a local level including:
  - Location within the elevated USRC corridor;
  - Cherry Street USRC Bridge's view of the Subway and adjacent Cherry Street Interlocking Tower, looking south on Cherry Street from Mill Street;
  - Cherry Street USRC Bridge's historic and functional connections with the Cherry Street Interlocking Tower;
  - Cherry Street USRC Bridge's visual connection with the former Gooderham & Worts distillery site to the north; and
  - Parliament Street and Cherry Street USRC Bridges' visual connection with the Victory Soya Mills Silos to the south.

As part of the analysis of impacts, factors such as scale or severity of impacts, whether they are to be temporary or permanent, reversible, or irreversible, are also considered. Indirect adverse impacts are identified where activities on or near the property may adversely affect its cultural heritage value or interest and/or heritage attributes. Positive impacts may also result where a property's cultural heritage value or interest and/or heritage attributes is conserved or enhanced.

Table 4-17 to **Table 4-19** presents the results of the Heritage Impact Assessment completed for each USRC subway bridge based on the 60% design drawings of the preferred solution and preliminary conceptual renderings[72], and considers possible direct adverse impacts, indirect adverse impacts, and positive impacts. For further information, see Section 5 of the Heritage Impact Assessment Reports contained in **Appendix C3**, **Appendix C4**, and **Appendix C5**.

Lower Sherbourne Street USRC Bridge

Since the proposed Hydro One utility bridge will be attached to the south wingwalls of the Lower Sherbourne Street USRC Bridge Expansion, minor indirect impacts are anticipated to the original 1927 structure through the introduction of an element not in keeping with the historical appearance. These modifications are considered to be reversible as the proposed Hydro One utility bridge could be removed in the future, and as such, this is not considered to be a direct impact (see

[72] Preliminary renderings are for conceptual illustrative purposes only and subject to change during detailed design.

Table 4-17 below).The approved USRC East Enhancement Project is anticipated to impact the south elevation of the subject bridge with the addition of a bridge extension. The Hydro One utility bridge will be affixed to this bridge extension and not the original 1927 structure. Impacts related to the USRC East Enhancement Project are being assessed in a separate HIA (AECOM 2021).

TABLE 4-17: IMPACT ASSESSMENT OF THE LOWER SHERBOURNE STREET USRC BRIDGE (SUBWAY)

Heritage Attribute	Description of Impacts	Direct or Indirect	Severity (permanent/temporary, reversible/irreversible)
Potential impacts to attributes related to its historical associations at a local level			
Its construction in 1927 as one of four similar Subways in the Waterfront Viaduct, a major City of Toronto initiative to establish a continuous, grade-separated rail line across the southern part of the City.	The preferred alternative will not impact the historical associations of the subject bridge as a component of the Waterfront Viaduct in the City of Toronto. All four structures will be retained and the Waterfront Viaduct, as a whole, will be retained as a continuous, grade-separate rail line.	**None**	**N/A**
Potential impacts to attributes related to its design associations at a local level			
The concrete-encased steel plate girder design and structural configuration.	The preferred alternative will not impact the concrete-encased steel girders or their configuration in the structure. These elements will not be removed or altered.	**None**	**N/A**
The precise construction, and excellent overall condition of the built up steel frame sections.	The preferred alternative will not impact the precise construction or overall excellent condition of the steel frame sections. These elements will not be removed or altered.	**None**	**N/A**
The concrete abutments and deck fascia: board-formed with elegant falsework panelling and angled returns to the south, all in excellent overall condition.	The preferred alternative will not impact the concrete abutments and deck fascia: board-formed with elegant falsework panelling and angled returns to the south, all in excellent overall condition	**None**	**N/A**
Potential impacts to attributes related to its contextual associations at a local level			
Its location within the elevated USRC.	The preferred alternative will not impact the location of the subject bridge or its relationship to the elevated USRC. The location of the subject bridge on the elevated	**None**	**N/A**

Heritage Attribute	Description of Impacts	Direct or Indirect	Severity (permanent/temporary, reversible/irreversible)
	USRC, will be retained and it will continue to function as a continuous, grade-separated rail line.		

Alterations related to the addition of the Hydro One utility bridge are anticipated to be limited to the proposed USRC Expansion bridge south of the rail corridor, and are not anticipated to result in alterations to any element of the original 1927 construction. However, the addition of the Hydro One utility bridge will result in the introduction of a new visual element. These alterations are considered to be reversible, as the proposed Hydro One utility bridge could be removed in the future if operational requirements change.

Additional impacts related to the introduction of the Hydro One utility bridge include potential vibration impacts as a result of construction-related activities and minor changes to the existing shadows on the south elevation of the bridge Section 5 of the HIA presents a complete discussion of these impacts and recommended mitigation measures (see **Appendix C3** for further information).

Parliament Street USRC Bridge

The top portion of the east and west decorative cast-in-place concrete wingwalls south of the rail corridor are anticipated to be impacted through select removal of a portion of concrete material and the construction of new concrete Hydro One utility bridge abutments. The removal of the existing concrete and addition of new concrete is considered to be a permanent impact to the Parliament Street USRC Bridge. The bridge is also anticipated to be indirectly impacted due to potential vibration impacts, soil disturbance, and the introduction of new infrastructure (see **Table 4-18** below).

TABLE 4-18: IMPACT ASSESSMENT OF THE PARLIAMENT STREET USRC BRIDGE (SUBWAY)

Heritage Attribute	Nature of Impact	Direct or Indirect	Severity (permanent/temporary, reversible/irreversible)
Potential impacts to attributes related to its historical associations at a local level			
Its construction in 1927 as one of four similar Subways in the Waterfront Viaduct, a major City of Toronto initiative to establish a continuous, grade-separated rail line across the southern part of the City.	The preferred alternative will not impact the historical associations of the subject bridge as a component of the Waterfront Viaduct in the City of Toronto. All four structures will be retained and the Waterfront Viaduct, as a whole, will be retained as a continuous, grade-separate rail line.	**None-**	**N/A**
Potential impacts to attributes related to its design associations at a local level			
The concrete-encased steel plate girder design and structural configuration.	The preferred alternative will not impact the concrete-encased steel girders or their configuration in the structure. These elements will not be removed or altered.	**None-**	**N/A**

Heritage Attribute	Nature of Impact	Direct or Indirect	Severity (permanent/temporary, reversible/irreversible)
The precise construction, and excellent overall condition of the built up steel frame sections.	The preferred alternative will not impact the precise construction or overall excellent condition of the steel frame sections. These elements will not be removed or altered.	**None**	**N/A**
The concrete abutments and deck fascia: board-formed with elegant falsework panelling and curved returns to the south, all in excellent overall condition.	The preferred alternative will result in select removal of the top portion of the board-formed concrete wingwalls on the south elevation of the bridge. A small section of the southern concrete wingwalls (approximately 600mm deep and 3250mm long) will be removed and replaced with new concrete and integrated with a new concrete abutment for the Hydro One utility bridge. Overall, this change is not considered significantly adverse and given the limited scale of the intervention in proportion to the overall size of the wingwall. Minor impacts to views of the decorated cast-in-place concrete deck fascia are anticipated for pedestrians and motorists on Parliament Street, Lake Shore Boulevard East, and the Gardiner Expressway.	**Direct**- The preferred alternative will result in direct impacts to the board-formed concrete abutments with falsework panelling. **Direct**- A small portion of the top of the bridge fascia on the south elevation will be partially obstructed by the proposed basic Hydro One utility bridge structure. Based on a review of design drawings, these visual obstructions are anticipated to be minor, and the vast majority of the decorative fascia will remain visible. Overall the structure will continue to express its cultural heritage value.	**Permanent**- The preferred alternative will permanently alter the original 1928-1929 cast-in-place concrete abutments through the removal of a section of the south wingwalls. **Irreversible-** The preferred alternative will result in the removal of a portion of the original concrete wingwalls, which is irreversible. **Reversible**- Minor visual impacts to the top portion of the south fascia are considered reversible if the proposed Hydro One utility bridge were removed. Overall, the scale and magnitude of these interventions is anticipated to be minor, as the structure, although altered and directly impacted, will continue to be able to express its cultural heritage value.
Potential impacts to attributes related to its contextual associations at a local level			
Its location within the elevated USRC.	The preferred alternative will not impact the location of the subject bridge or its relationship to the elevated USRC corridor. The location of the subject bridge on the elevated USRC corridor, will be retained and it will continue to function as a continuous, grade-separate rail line.	**None**	**N/A**

Heritage Attribute	Nature of Impact	Direct or Indirect	Severity (permanent/temporary, reversible/irreversible)
Its visual connection with the Victory Soya Mills Silos to the south.	The preferred alternative will result in minor impacts to the visual connection to the Victory Soya Mills Silos to the south.	**Indirect**- The preferred alternative will result in the introduction of infrastructure not in keeping with the original 1927 structure which will alter the visual connection from the Victory Soya Mills to the subject bridge.	**Permanent**- The introduction of the Hydro One utility bridge is considered a permanent alteration this heritage attribute. **Reversible**- The minor impacts to the visual connections to the Victory Soya Mills to the south of the subject bridge are considered to be reversible if the Hydro One utility bridge is removed in the future.

Alterations to the top portions of the east and west decorative cast-in-place concrete wingwalls south of the rail corridor are anticipated to include the addition of new cast-in-place concrete abutments in the areas of select concrete removals. The addition of concrete abutments for the Hydro One utility bridge is required to provide a flat bearing plate to support the structure.

Additional alterations are anticipated with the construction of the Hydro One utility bridge and will result in the following impacts: introduction of a new visual element; minor changes to the existing shadows on the south elevation of the bridge; minor impacts to views of the decorated concrete fascia on the south elevation; soil disturbance; and potential vibration impacts as a result of construction-related activities (see **Appendix C4** for further information).

Cherry Street USRC Bridge

The top portion of the east and west decorative cast-in-place concrete wingwalls south of the rail corridor are anticipated to be directly impacted through the select removal of concrete material and the construction of new concrete Hydro One utility bridge abutments. The removal of the existing concrete and addition of new concrete is considered to be a permanent impact to the Cherry Street USRC Bridge. The bridge is also anticipated to be indirectly impacted due to potential vibration impacts, soil disturbance, and the introduction of new infrastructure (see **Table 4-19** below).

TABLE 4-19: IMPACT ASSESSMENT OF THE CHERRY STREET USRC BRIDGE (SUBWAY)

Heritage Attribute	Nature of Impact	Direct or Indirect	Severity (permanent/temporary, reversible/irreversible)
Potential impacts to attributes related to its historical associations at a local level			
Its construction between 1928 and 1929 as one of four similar Subways in the Waterfront Viaduct, a major part of the City of Toronto's initiative to establish a continuous, grade-separated rail line across the southern part of the City.	The preferred alternative will not impact the historical associations of the subject bridge as a component of the 1928-1929 grade-separation project in the City of Toronto. All four structures will be retained and the Waterfront Viaduct, as a whole, will be retained as a continuous, grade-separated rail line.	**None**	**N/A**
Potential impacts to attributes related to its design associations at a local level			
The concrete-encased steel plate girder design and structural configuration.	The preferred alternative will not impact the concrete-encased steel girders or their configuration in the structure. These elements will not be removed or altered.	**None**	**N/A**
The precise construction, and excellent overall condition of the built up steel frame sections.	The preferred alternative will not impact the precise construction or overall excellent condition of the steel frame sections. These elements will not be removed or altered.	**None**	**N/A**-
The concrete abutments and deck fascia: board-formed with elegant falsework panelling and curved returns to the south, all in excellent overall condition.	The preferred alternative will result in select removal of the top portion of the board-formed concrete wingwalls on the south elevation of the bridge. A small section of the southern concrete wingwalls (approximately 600mm deep and 3250mm long) will be removed and replaced with new concrete and integrated with a new concrete abutment for the Hydro One utility bridge. Overall, this change is not considered significantly adverse given the limited scale of the intervention in	**Direct**- The preferred alternative will result in direct impacts to the board-formed concrete abutments with falsework panelling. **Direct**- The top portion of the bridge fascia on the south elevation will be partially obstructed by the proposed basic Hydro One utility bridge structure. Based on a review of design drawings, these visual obstructions are anticipated to be minor, and the vast majority of the decorative fascia will remain visible. Overall, the structure will continue to	**Permanent**- The preferred alternative will permanently alter the original 1928-1929 cast-in-place concrete abutments through the removal of a section of the south wingwalls. **Irreversible-** The preferred alternative will result in the select removal of a portion of the original concrete wingwalls, which is irreversible. **Reversible**- Visual impacts to the top portion of the south fascia are considered reversible if

Heritage Attribute	Nature of Impact	Direct or Indirect	Severity (permanent/temporary, reversible/irreversible)
	proportion to the overall size of the wingwall. Indirect impacts to views of the decorated cast-in-place concrete deck fascia are anticipated for pedestrians and motorists on Parliament Street, Lake Shore Boulevard East, and the Gardiner Expressway.	express its cultural heritage value.	the proposed basic Hydro One utility bridge were removed. Overall, the scale and magnitude of these interventions is anticipated to be minor, as the structure, although altered and directly impacted, will continue to be able to express its cultural heritage value.
Impacts to attributes related to its contextual associations at a local level			
Its location within the elevated USRC.	The preferred alternative will not impact the location of the subject bridge or its relationship to the elevated USRC corridor. The location of the subject bridge on the elevated USRC corridor, will be retained and it will continue to function as a continuous, grade-separate rail line.	**None**	**N/A**
The view of the Subway and adjacent Cherry Street Interlocking Tower, looking south on Cherry Street from Mill Street.	The preferred alternative will not impact views south from Mill Street to the bridge or the Cherry Street Interlocking Tower. These views will not be altered.	**None**	**N/A**
Its historic and functional connections with the Cherry Street Interlocking Tower.	The preferred alternative will not impact the historic and functional connections with the Cherry Street Interlocking Tower.	**None**	**N/A**
Its visual connection with the former Gooderham & Worts distillery site to the north.	The preferred alternative will not impact the visual connection with the former Gooderham & Worts distillery site to the north. These views will not be altered.	**None**	**N/A**
Its visual connection with the Victory Soya Mills Silos to the south.	The preferred alternative will result in limited impacts to the visual connection to the Victory Soya Mills Silos to the south.	**Indirect**- The top portion of the bridge fascia on the south elevation will be partially obstructed by the proposed basic Hydro One utility bridge structure, which will result in minor alterations to the visual	**Permanent**- The introduction of the Hydro One utility bridge is considered to be a minor and permanent alteration to this heritage attribute.

Heritage Attribute	Nature of Impact	Direct or Indirect	Severity (permanent/temporary, reversible/irreversible)
		connection with the Victory Soya Mills. Based on a review of design drawings, these visual obstructions are anticipated to be minor, and the vast majority of the decorative fascia will remain visible. Overall, the structure will retain its visual connection to the Victory Soya Mills to the south.	**Reversible**- The minor impacts to the visual connections to the Victory Soya Mills to the south of the subject bridge are considered to be reversible if the Hydro One utility bridge is removed in the future.

Alterations to the top portions of the east and west decorative cast-in-place concrete wingwalls south of the rail corridor are anticipated to include the addition of new cast-in-place concrete abutments in the areas of select concrete removals. The addition of concrete abutments for the Hydro One utility bridge is required to provide a flat bearing plate to support the proposed works.

Alterations are anticipated to be confined to the east and west wingwalls south of the rail corridor, while the wingwalls to the north of the rail corridor, the riveted steel plate girder piers, and the bridge superstructure are not anticipated to be directly impacted as a result of project works. Select concrete removals on the east wingwall to the south of the rail track are not anticipated to remove or directly impact the '1928' date stamp on the south portion of the east abutment.

Additional alterations are anticipated with the construction of the Hydro One utility bridge and include: the introduction of new infrastructure; minor changes to the existing shadows on the south elevation of the bridge; minor obstruction of views towards the decorated cast-in-place concrete deck fascia on the south elevation of the bridge; minor alterations to the visual connection with the Victory Soya Mills Silos to the south; soil disturbance, and potential vibration impacts as a result of construction-related activities.

The proposed addition on the Hydro One utility bridge is not anticipated to result in any impacts the historic or functional connections with the Cherry Street Interlocking Tower to the northeast. No impacts to significant views to the Gooderham and Worts Distillery or the Cherry Street Interlocking Tower to the north are anticipated (see **Appendix C5** for further information).

Mitigation Measures/Recommendations

The identified heritage attributes of the Lower Sherbourne Street USRC Bridge are anticipated to be impacted through the addition of a Hydro One utility bridge on the south elevation[73]. The proposed works are anticipated to have minor indirect impacts on the bridge, such as visual impacts due to the introduction of new infrastructure and potential vibration impacts during construction and which can be appropriately mitigated through implementation of a monitoring program. No permanent, negative impacts to the bridge are anticipated as the proposed installation of the Hydro One utility bridge is considered to be reversible, and could be removed in the future if operational priorities change.

The identified heritage attributes of the Parliament Street and Cherry Street USRC Bridges are anticipated to be impacted through the addition of a Hydro One utility bridge on the east and west wingwalls on the south side of the rail corridor. The proposed intervention is anticipated to have direct impacts on the USRC

[73] The utility bridge is to be affixed to the expanded Lower Sherbourne Street Subway bridge, as documented and approved in the 2018 Union Station Rail Corridor East Enhancements EPR.

bridges with alterations to the concrete wingwalls, potential vibration impacts, soil disturbance, and the introduction of new visual elements.

As such, the following mitigation measures should be undertaken and implemented:

- The Hydro One utility bridge will result in minor indirect impacts to the Lower Sherbourne Street Bridge, and minor permanent, direct impacts to the decorative cast-in-place concrete wingwalls on the south elevation of the Parliament Street and Cherry Street USRC Bridges. Mitigation measures outlined in this report have been prepared to minimize these impacts, and should be implemented as appropriate to the extent practicable.
- Concrete removals on the east wingwall to the south of the rail track should be designed to retain the existing '1928' date stamp on the south portion of the east abutment of the Cherry Street USRC Bridge. Construction and staging should be planned to allow for the proposed modifications of the east wingwall in a manner that retains this date stamp in situ. According to preliminary design drawings, which depict the proposed concrete removals as minor in scale relative to the overall size of the wingwalls, the date stamp will not be impacted in the proposed concrete removals or additions.
- Intervention should be planned to limit the visual impacts of the modifications, where feasible, based on technical constraints and road clearance requirements of the Parliament Street and Cherry Street USRC Bridges. In order to reduce the visual impacts of the utility bridge, planning should ensure that the intervention is compatible with the PHP. Similarly, consideration should be given to using materials, colours, and finishes that will make the utility bridge physically and visually compatible with, subordinate to, and distinguishable from the surrounding landscape and the three (3) USRC bridges.
    - The preliminary designs with aluminum louvres painted to be complementary with the setting is considered to be a suitable means of reducing visual impacts of the basic version of the structure and should be implemented in the final design, where feasible. To ensure that the deck fascia on the south elevation of the Parliament Street and Cherry Street USRC Bridges are not isolated or visually obstructed from the public, the protective cladding should be minimized and designed at a limited scale, where feasible, and the cladding should be installed in a manner that does not physically impact the deck fascia. As part of the final detailed design, the orientation of the louvred fin cladding on the USRC bridges should be selected to be consistent among all three (3) structures. In this respect, a design should be selected that is appropriate for use in the Lower Sherbourne Street USRC Bridge, Parliament Street USRC Bridge, and the Cherry Street USRC Bridge, to maintain a compatible and cohesive aesthetic for the entire Hydro One Conflict study area.
    - New concrete utility bridge abutments extending from the existing wingwalls should be constructed to be complimentary to the 1927-1928 decorative cast-in-place concrete wingwalls of the Parliament Street and Cherry Street USRC Bridges. In this respect, consideration should be given to implementing a decorative panel design on the face of the new abutment faces and to use colours and finishes similar to the existing wingwalls to ensure visual compatibility. By implementing suitable decorative finishes and colours on the new utility bridge abutments, the visual impacts of the concrete additions would be decreased. In consultation with the Preliminary Design Team (PDT) and a qualified person with recent, relevant heritage experience the new concrete utility bridge abutments will be designed to match the existing wingwalls of the Parliament Street USRC Bridge.
    - Additional modifications to the Parliament Street USRC Bridge, that may be required to address technical or safety considerations should be designed to be compatible with the bridge and with the Lower Sherbourne Street and Cherry Street USRC Bridges. In consultation with the PDT and a qualified person with recent, relevant heritage experience,

the guardrails and fencing on the bridge and wingwalls will have a contemporary design and be compatible with the other USRC bridges at the request of the Waterfront Toronto Design Review Panel.

- The preliminary designs should be reviewed prior to finalization (at the 90% completion milestone, for example) by a qualified person with recent, relevant heritage experience to confirm that visual impacts have been suitably minimized and that the materials, colours, and finishes are compatible with the PHPs. A qualified person will be required to review detailed design drawings of the utility bridge, including cladding options[74] to determined compliance with the recommendations of this Report.

- All interventions should be designed to be reversible. In this respect, the proposed solution should be designed in a manner that is reversible should the Hydro One utility bridge be removed in the future. According to available documentation, the proposed solution is reversible for the Lower Sherbourne USRC Bridge. The removal of the original concrete on the wingwalls of the Parliament Street and Cherry Street USRC Bridges is considered to be irreversible. However, should operational priorities change, the utility bridge and associated abutments could be removed, and the original cast-in-place concrete wingwalls could be repaired to match the original construction. While irreversible and permanent, careful and sympathetic rehabilitation could functionally and visually return the Parliament Street and Cherry Street USRC Bridges to their original state should the Hydro One utility bridges be removed in the future.
- Additional indirect temporary negative impacts are anticipated as a result of soil disturbance adjacent to the wingwalls of the Parliament Street and Cherry Street USRC Bridges to facilitate concrete removals and to construct the new utility bridge abutments. Where feasible, soil disturbance should be limited to the areas required for removals and abutment construction, and post-construction grading should be employed to return the slope adjacent to the wingwalls to its pre-construction conditions.
- The proposed intervention should be carried forward with an emphasis on decreasing the physical and visual impacts of the proposed works where practicable. The detailed design and implementation of interventions at the three (3) USRC bridges should be guided by a qualified person(s) with individual expertise, recent experience and knowledge relevant to the type of cultural heritage resources being considered and the nature of the activity being proposed, such as a heritage engineer, architect, or conservator with recent and relevant experience in the conservation of cultural heritage resources. Qualified persons should have specialized knowledge and expertise with recent experience with the conservation of road and/or rail bridges. Membership in good standing with the Canadian Association of Heritage Professionals (or comparable accredited organization) in a relevant area of practice is considered to be an asset.
- Construction and staging should be suitably planned and executed to ensure that there are no unintended impacts to the three (3) USRC bridges. The contractor responsible for construction should be informed of the cultural heritage value of the structure and no-go zones with fencing or other barriers should be installed adjacent to the work zone prior to construction, if feasible to obstruct pedestrian and vehicular traffic, to ensure there are no additional impacts.
- To ensure the bridge is not adversely impacted during construction, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations.
- The HIAs should be submitted in draft form for review and comment to the City of Toronto Heritage Preservation Services, the MHSTCI, Waterfront Toronto, and any other relevant heritage

[74] Bridge cladding option are subject to change as there is the potential for enhanced options depending on 3rd party requests.

stakeholder with an interest in this project. Upon completion, the final HIAs should be submitted to the City of Toronto and other applicable stakeholders for archival purposes.

4.2.3.4 Archaeology

4.2.3.4.1 Potential Effects and Mitigation Measures

As part of the USRC East Enhancements project, a Stage 1 Archaeological Assessment was completed in November 2018 by AECOM which confirmed through a visual inspection, analysis of historical sources and digital environmental data, that a small area within the USRC is recommended for a Stage 2 Archaeological Assessment as there is the potential of deeply buried intact archaeological resources. The Parliament Street to Cherry Street working area, south of the rail tracks contains this small area where a 'Stage 2 monitoring is requested if construction reaches a depth of 76m above sea level (ASL)' (see pink shading in **Figure 4-5**). The proposed relocation of Hydro One transmission lines to an underground transmission corridor is expected to reach depths of approximately 76m at some locations. Therefore, the exact locations and depth of excavation will be confirmed prior to construction of the underground utility corridor.

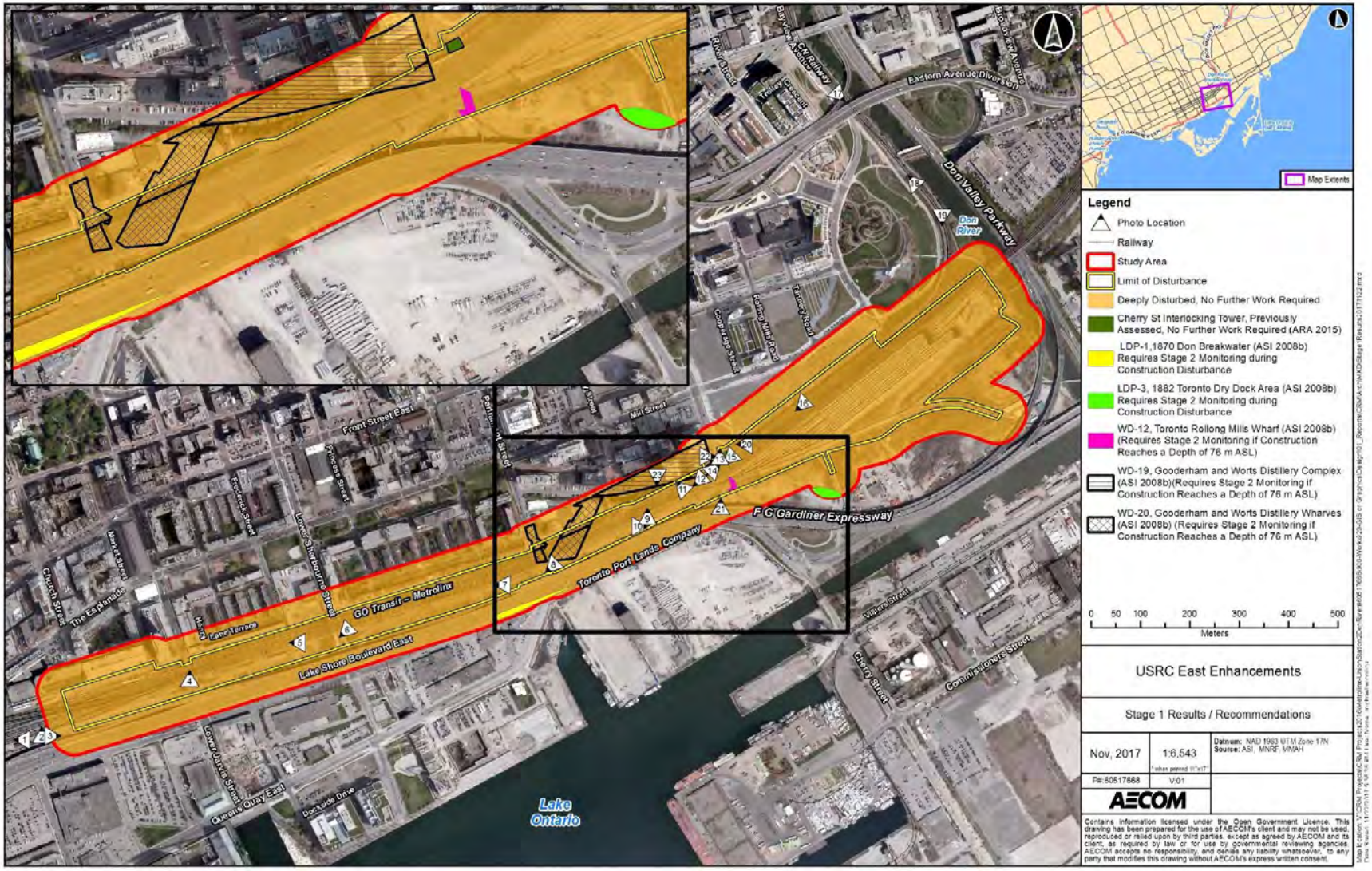

FIGURE 4-5: USRC EAST ENHANCEMENTS TPAP RESULTS OF STAGE 1 ARCHAEOLOGICAL ASSESSMENTS, WITH RECOMMENDATIONS AND PHOTO PLATES IN THE VICINITY OF THE USRC HYDRO ONE CONFLICT AREAS, CITY OF TORONTO

Additionally, the City of Toronto has identified a potential archaeological resource located within the USRC Hydro One Conflicts study area, known as the Knapp's Roller Boat. The Knapp's Roller Boat is an unusual ship, remembered for its innovative design (which appears as a cylinder) and was built in the late 1800's. In 1923, the roller boat was buried beside the former Polson Ironworks site at the east end of Toronto Harbour (i.e., located west of Lower Sherbourne Street, under the Gardiner Expressway). However, since the proposed relocation of Hydro One transmission lines to an underground transmission corridor is not expected to impact the Knapp's Roller Boat, no impacts to this archaeological resource is anticipated.

Based on this review, the Esplanade Transmission Station to Don Fleet JCT working area was assessed as part of the USRC East Enhancements project, is largely disturbed, and retains limited archaeological potential. Therefore, the proposed works to relocate transmission infrastructure using utility bridges and an underground corridor is not deemed to require further archaeological assessment, however, Stage 2 monitoring may be required, should the depth of excavation reach 76m ASL.

Mitigation Measures

Listed below are recommended courses of action for archaeological assessment within the USRC Hydro One conflicts study area:

- The Metrolinx USRC Hydro One conflicts study area does not require further archaeological assessment;
- Should the proposed construction of the underground transmission corridor reach a depth of 76m ASL, Stage 2 Monitoring will be required; and
- Should the proposed work extend beyond the current study area or should changes to the project design or temporary workspace requirements result in the inclusion of previously un-surveyed lands, these lands should be subject to a Stage 2 Archaeological Assessment.

Additionally, the following mitigation measures and monitoring commitments are recommended in the event of potential disturbance of unassessed (i.e., Knapp's Roller Boat) or undocumented archaeological resources:

- Develop and implement an Archaeological Risk Management Plan that addresses any recommendations resulting from Archaeological Assessments and documents all protocols for the discovery of human remains and undocumented archaeological resources. The Archaeological Risk Management Plan shall be amended to incorporate any additional actions required resulting from subsequent Archaeological Assessment Reports.
- All work shall be performed in accordance with Applicable Law, including but not limited to the Ontario Heritage Act, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), formerly the Ministry of Tourism, Culture and Sport (MTCS) Standards and Guidelines for Consultant Archaeologists (2011), and the MHSTCI document, Engaging Aboriginal Communities in Archaeology: A Draft Bulletin for Consultant Archaeologists in Ontario (2011).
- In the event that archaeological resources are encountered or suspected of being encountered during construction, all work will cease. The location of the findspot should be protected from impact by employing a buffer in accordance with requirements of the MHSTCI. A professionally licensed archaeologist will be consulted to complete the assessment. If resources are confirmed to possess cultural heritage value/interest then they will be reported to the MHSTCI, and further Archaeological Assessment of the resources may be required. If it is determined that there is a potential for Indigenous artifacts, Metrolinx should be contacted and Applicable Law will be followed.
- If final limits of the Project footprint are altered and fall outside of the assessed study area, additional Archaeological Assessments will be conducted by a professionally licensed archaeologist

prior to disturbance and prior to construction activities. This will include completing all required Archaeological Assessments resulting from the Stage 1 Archaeological Assessment (Stage 2, Stage 3 and Stage 4, as required) as early as possible, prior to the completion of design, and in advance of any ground disturbance.

- For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, additional Archaeological Assessment will be conducted by a professionally licensed archaeologist prior to disturbance.
- If human remains are encountered or suspected of being encountered during project work, all activities must cease immediately and the local police/coroner as well as the Bereavement Authority of Ontario on behalf of the Ministry of Government and Consumer Services must be contacted. Archaeological investigations of human remains will not proceed until police have confirmed the remains are not subject to forensic investigation. Once human remains have been cleared of police concern, the MHSTCI will also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act. If the human remains are determined to be of Indigenous origin, Metrolinx should be contacted and all Applicable Law must be adhered to.
- All Archaeological Assessment findings will be shared with Indigenous Nations & organizations, as per Metrolinx's Guide to Engaging with Indigenous Communities (2020).
- Performance of the work will occur within land previously subject to an Archaeological Assessment.
- Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities in the event that an archaeological resource is encountered.
- Further Archaeological Assessment may identify the need for monitoring during construction.
- The Waterfront Toronto: Archaeological Conservation and Management Strategy shall be consulted prior to construction and all work shall be performed in accordance with applicable strategies.

4.2.3.5 Land Use & Socio-Economic

4.2.3.5.1 Potential Effects and Mitigation Measures

Underground Utility Corridor and Utility Bridges

The Hydro One infrastructure is proposed to be relocated on lands the City of Toronto has designated as *Mixed Use, Park, and Utility Corridor*. Since the Hydro One infrastructure is an existing use within these designated areas, no conflicts with land use or socio-economic features are anticipated. Therefore, no residual land use effects are anticipated due to the proposed works to relocate transmission infrastructure using utility bridges and an underground corridor.

Additionally, utility bridges will be designed in a way to prevent/minimize ice accretion and water build up, to ensure safety for pedestrians passing under the structures along Lower Sherbourne Street, Parliament Street, and Cherry Street.

A 2021 Pedestrian and Cycling Connectivity Study is currently underway, as well as plans for a Waterfront Light Rail Transit portal and the Cherry streetcar line extension within the USRC. Following the EPR Addendum, Metrolinx will continue to consult with all applicable stakeholders through separate negotiations.

Don Fleet Junction

The proposed new Don Fleet JCT is on lands designated as *Natural Heritage* in the City of Toronto's Official Plan. Development is not generally permitted in the natural heritage system per municipal requirements, except where the underlying land use designation permits. As per Chapter 4, Section 4.3 of

the City's Official Plan, Parks and Open Space Areas permit *"public transit and essential public works and utilities, where supported by appropriate assessment".* Given that the new Don Fleet JCT is an essential utility requirement to support electrification of the USRC, a reduction of approximately 0.03 ha to the City's Natural Heritage System is unavoidable.

It is acknowledged that the Lower Don River Valley is designated as an *Urban River Valley* in the 2017 Greenbelt Plan. The Urban River Valley designation seeks to protect natural and open space lands along river ways, and assist in preserving the ecological connectivity to the Greenbelt Area. Policies seek to preserve natural settings of recreational lands, including parklands and trails.

In total, there is a potential loss of approximately 0.03 ha of 'parkland' area, which is mostly dominated by fresh-moist cotton coastal deciduous forest. Based on this understanding, the proposed new Don Fleet JCT is not anticipated to disrupt the ecological connectivity to the Greenbelt Area and surrounding parklands and the Lower Don Trail is to remain open (after construction) to preserve its recreational use. It should be noted that the existing/expanded Don Fleet JCT is an existing use within the City's Parks/Open Space Areas.

Additionally, policy 6.2.3 states *"all existing, expanded or new infrastructure which is subject to and approved under the Environmental Assessment Act, or which receives a similar approval, is permitted provided it supports the needs of adjacent settlement areas or serves the significant growth and economic development expected in southern Ontario and supports the goals and objectives of the Greenbelt Plan."*

The Don Fleet JCT is required to support electrification infrastructure, allowing for increased train service levels across the Metrolinx network. Therefore, the proposed infrastructure is intended to support the growth and development of transportation infrastructure in Southern Ontario which will allow for more economic development opportunities, as access and connectivity across the Greater Golden Horseshoe Area (GGHA) becomes more efficient and frequent.

Construction of the new and expanded Don Fleet JCT has the potential to impact the Lower Don Trail. It is anticipated that the Lower Don Trail will be closed during construction due to public safety reasons. If possible, an alternative temporary detour will be provided for the duration of construction. Metrolinx will coordinate internally to develop a trail diversion/detour plan will be prepared for the Lower Don Trail prior to construction and trail closure.

Fencing/gates will provide separation between Lower Don Trail users and construction activities. Nuisance effects may also be experienced by the public during construction, which are short-term effects that are difficult to prevent (e.x. noise, dust, etc.). The City of Toronto Parks, Forestry and Recreation Department and Ward Councilors will be notified prior to release of a public notice for construction.

Following construction, the Lower Don Trail will be re-opened for public use to maintain accessibility and connectivity within the City of Toronto and surrounding parklands. If the Lower Don Trail is directly impacted due to construction activities, it will be rehabilitated and brought to current City standards. Trail closures will be coordinated with planned trail improvements, to the extent possible. Permanent Durisol© walls will delineate the Don Fleet JCT from the Lower Don Trail, to ensure public safety and access to Hydro One infrastructure for approved personal only.

Mitigation Measures

The following courses of action are recommended to mitigate and monitor the proposed infrastructure within the USRC Hydro One conflicts study area:

- Metrolinx will engage with the City of Toronto to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.
- Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that minimize adverse effects to sensitive receivers.

- Develop a community notification protocol for Metrolinx review and approval which will indicate how and when surrounding property owners and tenants will be informed of anticipated upcoming construction works, including work at night, if any.
- Provide well connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours or closures, where required.
- Metrolinx will coordinate internally to develop a trail diversion/detour plan will be prepared for the Lower Don Trail prior to construction and trail closure.
- Metrolinx will provide a connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours where required, during the construction of the underground utility corridor and installation of utility bridges along Lower Sherbourne Street, Parliament Street, and Cherry Street.
- If the Lower Don Trail is directly impacted due to construction activities, it will be rehabilitated and brought to current City standards. Trail closures will be coordinated with planned trail improvements, to the extent possible;
- Provide temporary lighting and wayfinding signs and cues for navigation around the construction site.
- Access to businesses during working hours will be maintained, where feasible. Where regular access cannot be maintained, alternative access and signage will be provided.
- Ensure that proper fencing is erected prior to any earth moving, clearing or construction in order to prevent encroachment.
- Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.
- A Communication and Complaints Protocol will be developed prior to and implemented during construction.
- Additional consultation during construction phases to ensure that local businesses and properties owners are aware of construction scheduling and that staging options can be developed to minimize impacts to local access and travel to the extent possible.
- A Construction Monitoring Plan will be developed that identifies site-specific mitigation measures to be enacted before work begins. Mitigation measures contained within the plan will be regularly monitored during construction.
- Temporary access paths, walkways, cycling routes and fencing should be monitored.
- Continuing evaluation of the progress and potential effects of the proposed infrastructure.

4.2.3.6 Air Quality

Air quality impacts will be limited to the construction phase of the project. For details on construction-related impacts and mitigation measures that are applicable to the USRC Hydro One Conflicts scope, please see Section 4.9.7.

Refer to **Table 4-129** for a list of mitigation and monitoring commitment applicable to the USRC Hydro One Conflicts.

4.2.3.7 Noise and Vibration

Noise and vibration related impacts are anticipated to be limited to the construction phase of the project. For details on construction-related impacts and mitigation measures that are applicable to the USRC Hydro One Conflicts scope, please see Section 4.9.8.

Refer to **Table 4-130** for a list of mitigation and monitoring commitments applicable to the USRC Hydro One Conflicts.

4.2.3.8 Visual

4.2.3.8.1 Potential Effects and Mitigation Measures

Underground Utility Corridor

Since two (2) existing overhead circuits, one (1) existing underground circuit and one (1) spare circuit are proposed to be relocated to an underground transmission corridor, which is largely in a designated utilities corridor, there are no visual effects expected that warrant mitigation.

Utility Bridges

The relocation of Hydro One transmission infrastructure using utility bridges is expected to have visual effects on the south views of the Lower Sherbourne Street, Parliament Street and Cherry Street USRC Bridges. The preliminary concept renderings that outline the potential visual impacts of the proposed Hydro One utility bridges includes an example of the base concept design at the Lower Sherbourne Street USRC Bridge[75] (see **Figure 4-6**). The cladding would consist of basic louvres to provide protection from solar radiation and rain. For applicable mitigation measures, please see the visual recommendations outlined in Section 4.2.3.3.

FIGURE 4-6: PRELIMINARY DESIGN RENDERING OF HYDRO ONE UTILITY BRIDGE AT LOWER SHERBOURNE USRC BRIDGE[76]

[75] Preliminary rendering is for conceptual illustrative purposes only and subject to change during detailed design. Requests for surface treatments, lighting and aesthetics are subject to separate negotiations with Metrolinx, however the utility bridge design does not preclude other treatments.

[76] Rendering developed by 4Transit and DTAH Architects (2020).

The proposed utility bridge is to be attached/fixed to the existing structures; therefore, views to the waterfront from train passengers are not anticipated to be impacted, as the height of the louvers/cladding are to be a similar height as the existing bridge barriers. Existing views of the waterfront are also currently obstructed by the Gardiner Expressway located directly south of the proposed utility bridges.

Additional visual impacts related to the introduction of the Hydro One utility bridges include greater shadows which may appear on under passing roads, sidewalks and cycling lanes at certain times of the day.

Don Fleet Junction

The removal of existing Hydro One Tower #10A, installation of two (2) new BPEX structures, overhead connection of two (2) circuits from BPEX structures to the existing Hydro One Tower #9, and installation of Durisol© wall at the new Don Fleet JCT is anticipated to impact the viewshed of the Lower Don Trail (west side). Since Durisol© walls are required to delineate the new Don Fleet JCT from the Lower Don Trail (to ensure public safety), it is anticipated that the new Don Fleet JCT will impact the composition and character of current views experienced by pedestrians along the Lower Don Trail (west side). At this time, Durisol© wall dimensions and finishes are unknown and will be further explored during detailed design.

The replacement of three (3) existing potheads, and replacement/extension of the existing chain link fence with Durisol© walls to capture existing Hydro One Tower #9 is anticipated to slightly alter the viewshed of the Lower Don Trail (east side). Since utility infrastructure is currently present at this location, trail users experience views of Hydro One Tower #9 and overhead circuits when passing along the Lower Don Trail. In order to maintain sightlines along the trail, clear Durisol© wall panels are proposed on the north-west corner of the existing Don Fleet Junction. Given that the new and existing Don Fleet JCT is required to support electrification infrastructure, the visual impacts are unavoidable.

A Design Excellence process and urban design review will be completed during future project stages to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials, vegetative buffers, and careful placement of structures where suitable with surrounding land uses.

Special consideration should be given to the aesthetic design of the Don Fleet JCT Durisol© walls as much as possible, with consideration that the proposed infrastructure is within the City of Toronto's natural heritage system.

With respect to Durisol© walls, mitigation recommendations include the use of concrete patterning/windows where walls are adjacent to sensitive receptors, and consideration for grading design to minimize wall heights and maximize planting of trees and shrubs, where applicable. Discussions with the City of Toronto are ongoing to determine design solutions and/or additional mitigation measures as it relates to the potential for graffiti on the Durisol© walls. Additionally, offsetting tree removals where feasible, as per Metrolinx's Vegetation Management Protocol (January 2020) in affected areas and parks may reduce visual impacts.

Mitigation Measures

The following courses of action are recommended to mitigate and monitor the proposed infrastructure within the USRC Hydro One Conflicts study area:

- As part of detailed design, efforts will be made to minimize visual impacts as much as possible.
- A Design Excellence process will be followed to integrate the new infrastructure into the existing environment to reduce the extent of visual impacts. This will include screened enclosures, such as fencing and Durisol© walls.
- Anti-graffiti coating will be applied on public-facing Durisol© walls.

- Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts.
- A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas.
- Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary.
- Municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.
- The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.
- Offsetting tree removals where feasible, as per Metrolinx's Vegetation Management Protocol (January 2020) in affected areas and in parks; which may offset/minimize visual impacts.
- Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.
- Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction work zones.
- Measure illuminance levels using an illuminance metre in accordance with ANSI/IES RP-8-18 Chapter 4.
- Monitor effectiveness of light pollution mitigation measures.
- Construction management to enforce adherence to requirements in contract.
- Periodic inspection and maintenance such as repainting degraded finishes if required.

4.2.3.9 Utilities

As previously mentioned, subsequent to the approval of the GO Rail Network Electrification TPAP in 2017, Hydro One issued the *Transmission Line Relocation Study Report (Phase 2)* for the Rail Corridor Electrification to Metrolinx (December 14, 2018). This report identified conflicts with the proposed Metrolinx OCS infrastructure and the existing Hydro One transmission assets at multiple locations along the rail corridors, including locations within and around the USRC (Mile 0.72E to Mile 1.72E) that were not known at the time of preparing the GO Rail Network Electrification EPR.

4.2.3.9.1 Potential Effects and Mitigation Measures

The mitigation of these conflicts will require Hydro One to relocate transmission infrastructure to an underground utility corridor, using utility bridges and replace/install structures within the new and existing Don Fleet JCT to accommodate clearance requirements between Hydro One's transmission line conductors and the conductors of the proposed USRC OCS structures. Refer to Section 2.3 for additional detail.

Metrolinx and Hydro One have identified the need to locate an additional Hydro One transmission structure (i.e., steel monopole) between the Lower Don Valley River and Corktown Common to accommodate clearance requirements for the USRC Overhead Catenary System (OCS). A future addendum is to be completed to address environmental assessment requirements; at which time the significance of potential impacts will be determined.

4.2.3.10 EMI & EMF

The potential EMI/EMF effects for the USRC Hydro One study area are largely the result of relocating transmission cables to an underground utility corridor. The electric field is anticipated to be negligible for the new circuits, as they are largely confined within the utility corridor (utilizing a combination of surface troughs, cable banks and utility bridges). The two existing overhead circuits that are to be relocated, however, will now have an electric field at ground level. The acceptable level is 4.2 kV/m, and is in accordance with ICNIRP guidelines.

Mitigation measures and commitments are characterized and grouped as outlined in **Table 4-133**.

4.2.3.11 Stormwater Management

Since there is no major increase to impervious areas within the USRC due to the proposed footprint of Hydro One infrastructure anticipated, there are no impacts that require mitigation.

Construction activities, however, pose a potential impact due to sediment transport into adjacent natural areas including watercourses, such as the Don River Valley, and municipal drainage infrastructure. Therefore, the following mitigation measures and monitoring commitments are proposed:

- Prepare and implement a Drainage and Stormwater Report, an Erosion and Sediment Control Plan, detailed drainage design and erosion and sediment control drawings in accordance with the Ministry of the Environment, Conservation and Parks (MECP) *Stormwater Management Planning and Design Manual* (2003), the Greater Golden Horseshoe's *Erosion and Sediment Control Guideline for Urban Construction* (December, 2006), as amended from time to time, and the guidelines and regulatory requirements of the Conservation Authority having jurisdiction.
- The overall stormwater quality and quantity control strategy will be developed in accordance with all relevant municipal, provincial and federal requirements, as amended, as well as the requirements of Conservation Authorities having jurisdiction.
- Infiltration requirements for municipalities will be determined as per the design guidelines and standards.
- Develop and implement a Spill Prevention and Response Plan in accordance with the Project Agreement.
- Grab samples for existing watercourses and/or wetlands, when runoff from the site discharges to a watercourse and/or wetland will be conducted for pre-construction, during construction, and post construction conditions until the site is considered stabilized. Grab samples for watercourses and wetlands will be taken for non-precipitation event and for precipitation events to obtain a reasonable understanding of the turbidity levels. Post-construction monitoring of wetland areas may be required depending on input from Conservation Authorities.
- Monitoring will be conducted for potential oil spills and containment of spills to be conducted as per provincial requirements.
- Functionality of stormwater quantity controls including peak flows and water levels for storm events within the design range. Monitoring would require local rainfall data.
- Infiltration targets, measured by flow monitoring on infiltrative Low Impact Development (LID) Best Management Practices (BMPs).

A summary of mitigation and monitoring commitments for this section is included in **Table 4-134**.

4.2.3.12 Traffic

The following mitigation measures are recommended to ensure safe movement of vehicles and pedestrians during construction of the proposed infrastructure within the USRC:

- Traffic Control and Management Plan(s) will be developed prior to construction to maintain reasonable access through work zones, to the extent possible.
- Access to nearby land uses will be maintained to the extent possible. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur.
- Potential effects to pedestrian and cyclist activities during construction will be mitigated through the installation of appropriate wayfinding, regulatory, and warning signs.
- Traffic impacts to be monitored in accordance with the Traffic Control and Management Plan and adjusted as necessary during the construction period.
- Cycling network impacts to be monitored in accordance with the Construction Traffic Control and Management Plan and adjusted as necessary during the construction period.
- Partial or full road closures may be required as a result of construction staging for the utility bridge installations at Lower Sherbourne Street, Parliament Street and Cherry Street. Clearly delineated, and appropriately signed route options, with clearly marked detours will be provided during construction, where required;
- Ensure that the public is notified in advance of any potential service disruptions.
- Consult with local transit agencies to establish a suitable mitigation strategy to be implemented.
- Traffic impacts to be monitored in accordance with the Construction Traffic Control and Management Plan and adjusted as necessary during the construction period.

Additionally, it is anticipated that sightlines on southbound traffic may be impacted by the installation of the utility bridges. Therefore, a sightline analysis will be reviewed by the Contractor and will take into account City of Toronto Guidelines. The Contractor will be responsible for completing a photometric analysis to ensure safe traffic movements. Depending on the results of the analysis, additional mitigation measures may be proposed to minimize potential traffic impacts (e.g. installation of additional signage or advance warning signals/lights).

As the Hydro One transmission cables generate heat, this will help prevent ice buildup for roadways passing underneath. The utility bridges will be designed in a way to prevent/minimize ice accretion and water build up.

For potential impacts and mitigation measures related to the Lower Don Trail, please refer to Section 4.2.3.5 above.

A summary of mitigation and monitoring commitments for this section is included in **Table 4-136**.

4.3 Lakeshore West Rail Corridor

4.3.1 Natural Environment

A Natural Environment Assessment Report (refer to **Appendix A**) was prepared, which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-123** and **Table 4-124**.

4.3.1.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.1.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

4.3.1.2.1 Potential Effects and Mitigation Measures

4.3.1.2.1.1 Terrestrial

4.3.1.2.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report prepared as part of the 2017 GO Rail Network Electrification TPAP. Impacts to the following communities were identified as part of the 2017 assessment: Transportation and Utility (CVI), Residential (CVR), Commercial and Institutional (CVC), Deciduous Thicket (THD), Green Land (CGL) and Deciduous Woodland (WOD) communities.

Additional vegetation removal areas within Section LSW-2 associated with the new OCS infrastructure are presented in **Table 4-20** and depicted in **Appendix A, Figure LSW-10**.

The Transportation and Utility (CVI) lands that include the existing rail corridor are comprised of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due to minimal canopy cover. Mitigation for CVI areas includes ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, minor vegetation removals within Commercial and Institutional (CVC) lands will be required within the vegetation clearing zone. While vegetation removals are required within CVC areas, they provide limited habitat for wildlife. Therefore, the removals within these areas are considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CVC community, the extent of tree removals in these areas is minor. Mitigation for these areas includes compliance with the general mitigation measures for vegetation/tree clearing identified below.

Details relating to impacted areas within Toronto and Region Conservation Authority (TRCA) Regulated Areas can be found in **Section 4.3.1.2.1.4.**

TABLE 4-20: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES – LSW-2*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Commercial and Institutional (CVC)	0.001	0.004	0.005	Minor
Transportation and Utilities (CVI)	0.044	0.222	0.266	Minor

**areas are approximations for discussion purposes only and not based on surveyed data*

Mitigation Measures

- The following mitigation measures, which are common to all ELC communities, will be implemented to minimize/mitigate the potential impacts related to vegetation/tree removals: Vegetation management in accordance with Metrolinx's *Vegetation Guideline* (2020) will include:
    - **Detailed Tree Inventory** – All trees 10 centimetres or greater in diameter within the study area or with canopies or Tree Protection Zones (TPZ) extending into the study area. Species at Risk (SAR) that may be directly impacted by the tree removal shall be identified during the tree inventory to the extent possible using tree inventory methods. This includes identification of tree SAR such as Butternut as well as information on the potential suitable habitat for SAR, such as the presence of bat cavity trees, where visible during the leaf-on period.
    - **Tree Protection** – Detailed measures to protect retained adjacent trees. This will include TPZ limits, diagram of tree protection barrier type, tree protection measures, and construction storage and staging areas where information is available.
    - **Vegetation Compensation** – Metrolinx has established a vegetation compensation approach for determining and implementing compensation for the removal of trees from the Metrolinx ROW as well as public and private lands. It is a landscape, science-based approach designed to reflect the basic principles of the TRCA's ecosystem-based approach in addition to following the requirements of applicable bylaws. Compensation will follow one or a combination of the following approaches: ecological, baseline, or bylaw.
    - **For Trees within Metrolinx Property:** All trees within the Metrolinx ROW will be compensated for using either an ecological or baseline approach. Where tree removals are located within a designated natural area, ecological compensation will be implemented. Where removals are outside a designated natural area, a 1:1 ratio approach will be implemented.
    - **For Public/Private Trees:** Compensation for trees within public and private lands, including those on the boundary between the Metrolinx ROW and public or private lands, will follow with the requirements of applicable bylaws. Trees on public or private lands that are not subject to bylaws/regulations will be compensated for following an ecological or baseline approach. Metrolinx will work directly with residents to address the loss of trees on private property.
    - **Tree End Use:** Options for the end use of trees removed from Metrolinx property (e.g. reuse/recycling options) will be developed as per the recommendations in the guideline.
- Metrolinx will make efforts to comply with the *Forestry Act* in relation to trees planted on the boundary between two lands (i.e., lands that are Metrolinx owned and lands that are not Metrolinx owned); and
- Compliance with the *Migratory Birds Convention Act* (MBCA).

4.3.1.2.1.2 Aquatic

There are no aquatic features within the track upgrade areas, and therefore no aquatic footprint impacts.

4.3.1.2.1.3 Species at Risk

Given the low potential of occurrence of Chimney Swift, Monarch, and Nine-spotted Lady Beetle, there are no anticipated footprint impacts to these species or their habitat.

4.3.1.2.1.4 Designated Areas

There are no footprint impacts within any Designated Areas, including City of Toronto Ravine and Natural Features Protection By-law areas (RNFP).

4.3.1.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.1.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.1.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

Although track upgrades are proposed in this section as part of the NT&F TPAP, associated OCS infrastructure will be within areas that have already been assessed as part of the 2017 TPAP as shown in **Appendix A**, **Figures LSW 28 to 29.**

4.3.1.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.1.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.1.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

The construction footprint of the new Walkers Line Layover facility will require vegetation removal within all areas included within this addendum study area as shown in **Appendix A, Figure LSW-41 to LSW-42**. Therefore, impacts related to vegetation removal have been addressed within the New Track & Facilities TPAP Draft Natural Environment Impact Assessment Report (Gannett Fleming, 2020).

4.3.2 Preliminary Environmental Site Assessment

A Preliminary Environmental Site Assessment (refer to **Appendix B**) was prepared for new layover facilities. A summary of mitigation and monitoring commitments for this section is included in **Table 4-125**.

4.3.2.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.2.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

4.3.2.2.1 Potential Effects and Mitigation Measures

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

4.3.2.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.2.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.2.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

Although track upgrades are proposed in this section as part of the NT&F TPAP, associated OCS infrastructure will be within areas that have already been assessed as part of the 2017 TPAP.

4.3.2.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.2.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.2.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

Based on available information to-date and site observations, there is the potential for environmental contaminant impact to the Walkers Line Layover from on-site and off-site historical and current land uses. A Phase II ESA is recommended at the Walkers Line Layover to assess the quality of the soils and groundwater in accordance with the current applicable MECP Standards.

It is anticipated during the construction of the proposed layover on the Subject Property, geotechnically unsuitable soils will likely require removal to achieve a proper substrate and backfill materials will likely need to be imported to form the foundation. Therefore, it is also recommended that Metrolinx complete a soil and groundwater pre-construction assessment (sampling) in conjunction with the Phase II ESA at the anticipated limits and depth of disturbance to determine the quality of soils for reuse and categorize the excess soils for proper off-site disposal. The results of the pre-construction assessment should be compared to the soil and groundwater conditions following a post-construction assessment.

In addition, the following mitigation and monitoring measures will be implemented at the layover facility:

- Develop a Soil and Excavated Materials Management Plan for the handling, management and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the work. The plan will be overseen by a Qualified Person pursuant to Ontario Regulation 153/04 under the Environmental Protection Act (QP) and will comply with Ontario Regulation 406/19 (On-Site and Excess Soil Management – to be enacted into law on January 1, 2021), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices (April 2019, as amended) and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement, as applicable.
- Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per Ontario Regulation 347 (as amended) and all Applicable Law.
- The Soil and Excavated Materials Management Plan will be reviewed and approved by Metrolinx prior to construction.
- A Soil and Excavated Material Monthly Dashboard Report will be developed by the Constructor for Metrolinx review that includes monitoring and performance data related to the management of excavated materials for the preceding month.

- Upon completion of the work, the Constructor will submit a Soil and Excavated Material Management Implementation Report to Metrolinx.

4.3.3 Cultural Heritage

Please refer to **Appendix C1** for a description of methodology followed for assessment of Cultural Heritage impacts. Additional details can be found in the Cultural Heritage Technical Memo contained in **Appendix C1**. A summary of mitigation and monitoring commitments for this section is included in **Table 4-126**.

4.3.3.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.3.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

4.3.3.2.1 Potential Effects and Mitigation Measures

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.3.3.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.3.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.3.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

Although track upgrades are proposed in this section as part of the NT&F TPAP, associated OCS infrastructure will be within areas that have already been assessed as part of the 2017 TPAP.

4.3.3.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP

4.3.3.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.3.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.3.4 Archaeology

A Stage 1 Archaeological Assessment Report (refer to **Appendix D**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-127**.

4.3.4.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.4.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

4.3.4.2.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events, and according to the S & G Section 1.3.2, the area does not retain archaeological potential. No further archaeological assessment is required.

No mitigation measures are required.

4.3.4.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.4.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.4.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

Although track upgrades are proposed in this section as part of the NT&F TPAP, associated OCS infrastructure will be within areas that have already been assessed as part of the 2017 TPAP.

4.3.4.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.4.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.4.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

There is potential for the disturbance of unassessed or documented archaeological resources within the Walkers Line Layover site. For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, a Stage 2 Archaeological Assessment conducted by test pit survey at five metre intervals will be conducted by a professionally licensed archaeologist prior to disturbance. Refer to **Table 4-127** for recommended mitigation measures.

According to the S & G Section 2.1.2, test pit survey is required on terrain where ploughing is not viable, such as wooded areas, properties where existing landscaping or infrastructure would be damaged, overgrown farmland with heavy brush or rocky pasture, and narrow linear corridors up to 10 metres wide.

Based on the results of the Stage 2 studies, Stage 3 and/or 4 Archaeological Assessments will also be carried out as required during detailed design. Refer to **Appendix D** for detailed mapping of archaeological potential at this location.

4.3.5 Land Use and Socio-Economic

A Land Use and Socio-Economic Assessment Report (refer to **Appendix E**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-128**.

4.3.5.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.5.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

4.3.5.2.1 Land Use – Potential Effects and Mitigation Measures

The OCS infrastructure will be located within the rail ROW in this section, though there are some areas where engineering solutions will be required to keep OCS structures within the ROW. The proposed design solutions and where they will occur will be finalized in the Detailed Design phase of the Project. There are no expected footprint effects as a result of this activity.

Mitigation Measures

No mitigation measures are required.

4.3.5.2.2 Socio-Economic – Potential Effects and Mitigation Measures

There are no sensitive facilities adjacent to the additional OCS infrastructure area, and therefore there are no effects anticipated.

There are two large parks in close proximity to the rail corridor: Laburnham Park and Don Russel Memorial Park. Laburnham park includes sporting amenities such as tennis courts and Don Russell Memorial Park includes sporting amenities such as a baseball field as well as a warehouse building directly adjacent to the corridor.

There are no anticipated adverse effects on these recreational amenities due to the implementation of electrification infrastructure identified as part of the conceptual design developed for the Significant Addendum to the Electrification TPAP. Notwithstanding this, potential conflicts with recreational amenities will be reviewed in further detail during the Detailed Design phase, and if required, the City of Toronto will be consulted to determine appropriate design solutions to mitigate/minimize effects to recreational amenities.

Other potential effects on the socio-economic environment associated with the LSW-2 corridor have been assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.3.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.3.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*
- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.3.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.3.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

Ensure that the mitigation recommendations outlined in the respective reports listed above to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF are adhered to and implemented during Detailed Design and construction.

4.3.5.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.5.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.5.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

Although track upgrades are proposed in this section as part of the NT&F TPAP, associated OCS infrastructure will be within areas that have already been assessed as part of the 2017 TPAP.

4.3.5.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.5.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.5.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

4.3.5.8.1 Land Use – Potential Effects and Mitigation Measures

The proposed additional OCS infrastructure area associated with the Walkers Line Layover is located within the City of Burlington in an area currently designated as *General Employment* which permits transportation uses. Additional property requirements have been identified as part of the NT&F TPAP in order to accommodate proposed project infrastructure.

Mitigation Measures

The additional OCS infrastructure area associated with the Walkers Line Layover is located in an area of compatible land use with the existing land use and zoning of the property. Although Metrolinx is not subject to municipal permits and approvals, our policy is to adhere to the intent of the relevant permits/approvals requirements to the greatest extent possible. However, further coordination (which may include a series of meetings, discussions, and agreements) with the City of Burlington will be undertaken during future project phases to finalize design details and minimize any conflicts on adjacent uses. Metrolinx is currently in discussions with the landowners regarding the use of this property and will reach an agreement prior to the commencement of construction activities.

4.3.5.8.2 Socio-Economic – Potential Effects and Mitigation Measures

Sidewalks extend north and south on both sides of Walkers Line, on the south side of Harvester Road and along Fairview Street. According to the City of Burlington Cycling Plan, there is an existing multiuse path south of Fairview Street along Walkers Line.

There are no anticipated adverse effects on these recreational amenities due to the implementation of electrification infrastructure identified as part of the conceptual design developed for the Significant Addendum to the Electrification TPAP. Notwithstanding this, potential conflicts with recreational amenities will be reviewed in further detail during future project phases, and if required the City of Burlington will be consulted to determine appropriate design solutions to mitigate/minimize any effects to recreational amenities.

Other potential effects on the socio-economic environment associated with the Lakeshore West Corridor have been assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.3.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.3.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*
- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.3.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.3.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

The mitigation measures outlined in the respective sections/reports listed above for Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF will be adhered to and implemented during Detailed Design and construction.

4.3.6 Air Quality

A Regional Air Quality Study Report (refer to **Appendix F1**) details the impact assessment completed for this discipline, which is described in Section 4.8.7.2. A summary of mitigation and monitoring commitments for this section is included **Table 4-129**.

4.3.7 Noise and Vibration

The assessment of potential noise and vibration effects within this corridor is detailed in **Appendix G2**. **Appendix O2** provides maps showing the locations of receptors and recommended noise and vibration mitigation. A summary of mitigation and monitoring commitments for this section is included in **Table 4-130**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.2.

4.3.7.1 Operational Noise Assessment

The predicted Adjusted Noise Impacts for the project are summarized in **Table 4-21**, and the locations of the “segments” are presented in **Figure 3-3**.

Impact ratings for the evaluated 80 representative receptors listed in the table can be summarized as follows:

- 80 daytime and nighttime Adjusted Noise Impacts were classified as insignificant (i.e., less than 2.99 dB).

There are no Adjusted Noise Impacts that were classified as significant (i.e., between 5 and 9.99 dB increase) or very significant (i.e., greater than 10 dB increase). The Adjusted Noise Impacts for receptors near the Canpa Subdivision are less than zero; which indicates that the Post-project sound levels are below the 55 dBA default Pre-project sound level, not that sound levels are predicted to decrease.

As all Adjusted Noise Impacts were predicted to less than 5 dB, investigation of noise mitigation was not required for this Corridor. The negative numbers seen in **Table 4-21** are the result of the future predominantly electric train fleet replacing the existing full diesel fleet. Although train volumes are increasing, this increase is off-set by the use of quieter electric locomotives. In some cases, the negative Adjusted Noise Impacts are the result of existing predicted levels that are below the 55 dBA / 50 dBA default Pre-project sound levels.

TABLE 4-21: SUMMARY OF ADJUSTED NOISE IMPACTS

Segment	Adjusted Impact Rating[1]	Average Objective [2]		Average Adjusted Noise Impact (dB)		Investigate Mitigation? [4]
		Day[3]	Night[3]	Day[3]	Night[3]	
Exhibition GO to Park Lawn GO	Insignificant	62.8	60.0	0.5	0.9	No
Park Lawn GO to Mimico GO	Insignificant	60.4	57.9	-0.2	-0.6	No
Mimico GO to Willowbrook	Insignificant	60.8	57.8	-1.2	-1.4	No
Willowbrook to Long Branch GO	Insignificant	58.6	56.0	1.1	0.4	No
Long Branch GO to Port Credit GO	Insignificant	65.8	63.3	-0.5	-0.6	No
Port Credit GO to Clarkson GO	Insignificant	62.4	61.0	-0.2	0.0	No
Clarkson GO to Oakville GO	Insignificant	58.7	56.2	-0.7	-0.4	No
Oakville GO to Bronte GO	Insignificant	57.1	54.3	-0.9	-0.6	No
Bronte GO to Appleby GO	Insignificant	55.0	50.2	-3.9	-1.2	No
Appleby GO to Burlington GO	Insignificant	56.0	53.3	-1.7	-0.2	No
Canpa Subdivision	Insignificant	55.0	50.0	-10.2	-8.0	No

Notes: [1] Ratings are quantified as: Insignificant – Less than 3 dB, Noticeable – 3 dB to 4.99 dB, Significant – 5 to 9.99 dB.
[2] The objective is the higher of either the Pre-project sound level or the 55 / 50 dBA default day/night sound levels.
[3] Daytime is a 16-hour period (i.e., from 0700h to 2300h) and Nighttime is an 8-hour period (i.e., from 2300h to 0700h).
[4] The potential to mitigate is considered when an increase of 5 dB or greater, relative to the objective level, is predicted as per the MOEE/GO Protocol. Such an increase is considered significant (or greater). An Adjusted Noise Impact greater than 5 dB requires the investigation of mitigation.

The predicted sound levels from the electric traction power facilities, were evaluated at nearby receptors and are summarized in **Table 4-22**. The predicted sound levels from the electric traction power facilities at nearby receptors were below the applicable limits; therefore, no mitigation measures were investigated for these facilities.

TABLE 4-22: PREDICTED SOUND LEVELS FROM ELECTRIC TRACTION POWER FACILITIES

Electric Traction Power Facility	Receptor ID	Evaluation Location	Period[1]	Predicted Sound Levels	Applicable Limit	Compliance with Applicable Limit
				(dBA)	(dBA)	(Yes/No)
Mimico SWS	R19	Plane of Window	Daytime\Evening	44	50	Yes
			Nighttime	44	45	Yes
		Outdoor Area	Daytime\Evening	43	50	Yes
Oakville SWS	R55	Plane of Window	Daytime\Evening	33	50	Yes
			Nighttime	33	45	Yes
		Outdoor Area	Daytime\Evening	32	50	Yes

Burlington TPS	R73	Plane of Window	Daytime\Evening	32	50	Yes
			Nighttime	32	45	Yes
		Outdoor Area	Daytime\Evening	30	50	Yes
Mimico TPS	R79	Plane of Window	Daytime\Evening	44	50	Yes
			Nighttime	44	45	Yes
		Outdoor Area	Daytime\Evening	43	50	Yes

Notes: [1] Daytime occurs from 0700-1900h. Evening occurs from 1900h-2300h. Nighttime occurs from 2300-0700h.

The predicted sound levels from the Post-project layover sites were evaluated at nearby receptors and are summarized in **Table 4-23**. None of the predicted Post-project levels were over the applicable limits.

TABLE 4-23: PREDICTED SOUND LEVELS FROM POST-PROJECT LAYOVER SITES

Layover	Receptor ID	Evaluation Location	Period	Predicted 1-hr L_{EQ} Sound Levels (dBA)	Applicable Limit (dBA)	Compliance with Applicable Limit (Yes/No)
Willowbrook Rail Maintenance Facility / Mimico Layover	R16	Outdoor Area	Daytime\Evening	50	55	Yes
		Façade	Daytime\Evening \Nighttime	52	55	Yes
Walkers Line Layover	R69	Outdoor Area	Daytime\Evening	50	55	Yes
		Façade	Daytime\Evening \Nighttime	53	55	Yes

4.3.7.2 Operational Vibration Assessment

Where sensitive receptors fall within areas of influence where operational vibration levels are expected to exceed the MOEE/GO Protocol vibration limits, mitigation is recommended. Of the 95 switches included in this assessment, 62 triggered assessment of mitigation. Of the approximately 7 km of trackwork, none triggered assessment of mitigation. These results are summarized in **Table 4-24** and **Table 4-25**.

The recommended vibration mitigation is identified as ballast mats, though consideration of other mitigation options, such as under sleeper pads or resilient fixation can be assessed at the detailed design stage.

TABLE 4-24: SUMMARY OF VIBRATION MITIGATION REQUIRED - MILES 1 TO 10

New Infrastructure Assessed	Location	Mitigation Required?	Receptors Affected
Switch	Mile 5.99	Yes	Condo Building on Legion Rd N.
Switch	Mile 6.05	Yes	Townhomes along Harbourview Cres, and Bluewater Crt.
Switch	Mile 6.11	Yes	
Switch	Mile 6.13	Yes	
Switch	Mile 6.17	Yes	
Switch	Mile 6.19	Yes	
Switch	Mile 6.24	Yes	Homes along Portland St.
Switch	Mile 6.3	Yes	Homes along Portland St, Burlington St, and Skelton St.
Switch	Mile 6.35	Yes	Homes along Cavell Ave
Switch	Mile 6.36	Yes	
Switch	Mile 6.42	Yes	
Switch	Mile 8.27	Yes	Homes along Whitlam Ave.
Switch	Mile 8.27	Yes	
Switch	Mile 8.3	Yes	
Switch	Mile 8.32	Yes	Homes along Carnation Ave.
Switch	Mile 8.33	Yes	
Switch	Mile 8.36	Yes	
Switch	Mile 8.36	Yes	
Switch	Mile 8.39	Yes	Homes along Twenty Sixth St.
Switch	Mile 8.4	Yes	
Switch	Mile 8.41	Yes	
Switch	Mile 8.43	Yes	Homes along Evergreen Ave.
Switch	Mile 8.49	Yes	
Switch	Mile 8.5	Yes	
Switch	Mile 8.58	Yes	Homes along Laburnham Ave.
Switch	Mile 8.58	Yes	
Switch	Mile 8.65	Yes	
Switch	Mile 8.65	Yes	
Switch	Mile 8.7	Yes	Homes along Thirtieth St, and Twenty Ninth St.
Switch	Mile 8.79	Yes	Homes along Thirty Second St.
Switch	Mile 8.83	Yes	
Switch	Mile 8.83	Yes	
Switch	Mile 8.9	Yes	
Switch	Mile 8.94	Yes	Homes along Long Branch Ave.
Switch	Mile 9	Yes	

TABLE 4-25: SUMMARY OF VIBRATION MITIGATION REQUIRED - MILES 10 TO 32

New Infrastructure Assessed	Location	Mitigation Required?	Receptors Affected
Switch	Mile 13.56	Yes	Homes along Kane Rd.
Switch	Mile 13.63	Yes	Homes along Harrison Ave.
Switch	Mile 13.63	Yes	
Switch	Mile 13.69	Yes	Homes along Renshaw Ct, and Harrison Ave..
Switch	Mile 13.74	Yes	Homes along Renshaw Ct, and Queen St W.
Switch	Mile 13.8	Yes	
Switch	Mile 13.81	Yes	
Switch	Mile 13.87	Yes	Homes along Merlot Ct, and Queen St W.
Switch	Mile 16.4	Yes	Homes along Balsam Ave, and Walden Cir.
Switch	Mile 16.47	Yes	
Switch	Mile 16.87	Yes	Apartments along Bromsgrove Rd.
Switch	Mile 17	Yes	
Switch	Mile 19.97	Yes	Homes off Morrison Rd.
Switch	Mile 20.03	Yes	
Switch	Mile 20.58	Yes	Homes along Chartwell Rd..
Switch	Mile 20.59	Yes	
Switch	Mile 21.5	Yes	Condominiums along Cornwall Rd
Switch	Mile 21.52	Yes	
Switch	Mile 21.56	Yes	
Switch	Mile 21.57	Yes	
Switch	Mile 21.6	Yes	
Switch	Mile 31.01	Yes	Homes along Fassel Ave
Switch	Mile 31.06	Yes	
Switch	Mile 31.11	Yes	
Switch	Mile 31.11	Yes	
Switch	Mile 31.17	Yes	
Switch	Mile 31.29	Yes	

4.3.7.3 Potential Effects and Mitigation Measures

Operational Noise Assessment

All Adjusted Noise Impacts were insignificant (i.e., less than +3 dB) for the Lakeshore West Corridor train movements. Therefore, investigation of noise mitigation was not required.

For electric traction power facilities, the predicted noise levels at nearby receptors were below the limits. Therefore, noise mitigation for electric traction power facilities was not required.

For layover sites, the predicted noise levels at nearby receptors were below the limits for all layovers.

Operational Vibration Assessment

None of the approximately 7 km of new trackwork triggered the need for vibration mitigation. Predicted vibration effects for new switches were found to exceed the MOEE/GO Protocol limits and mitigation was

recommended for 62 of the 95 new switches. The recommended vibration mitigation is identified as ballast mats, though other mitigation options can be considered such as under sleeper pads or resilient fixation. Further evaluation of the mitigation options based on administrative, operational, economic and technical feasibility should be completed at the detailed design stage.

4.3.8 Visual

A Visual Assessment Report (refer to **Appendix H**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-131**.

4.3.8.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.8.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

4.3.8.2.1 Potential Effects and Mitigation Measures

This section consists mostly of *Employment/Industrial* land uses along the railroad. These areas have been classified as having negligible visual impact and require no mitigation. Two large parks and a *Residential* neighbourhood are adjacent to the railroad to the south, but since the additional proposed infrastructure is within the existing rail ROW, these areas have been classified as a *Negligible* visual impact.

There are no anticipated impacts from the proposed OCS infrastructure in this section; therefore, no mitigation measures have been proposed.

OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.8.3 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.8.4 OCS: Section LSW-5 – Clarkson Station to Oakville Station

Although track upgrades are proposed in this section as part of the NT&F TPAP, associated OCS infrastructure will be within areas that have already been assessed as part of the 2017 TPAP.

4.3.8.5 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.8.6 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.8.7 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

Due to visual receptor's and the site's proximity to natural/conservation areas, this site is anticipated to Highly impact surrounding views to and from Shoreacres Creek. The renderings in **Figure 4-7** to **Figure 4-10** conceptually depict the visual impacts of the proposed layover facility.

The installation of OCS infrastructure will affect the viewshed along the rail corridors, particularly in areas of vegetation/tree clearing. Visual impact mitigation strategies for OCS will be identified and incorporated

into the detailed design process. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables (see **Appendix F** and **Appendix G5** for further details).

Local municipalities and key stakeholders will be consulted during detailed design, as required. Mitigation measures related to the construction of OCS at the Walkers Line Layover are further detailed in **Table 4-131**.

FIGURE 4-7: EXISTING WALKERS LINE LAYOVER SITE - BIRD'S EYE VIEW (LOOKING SOUTHWEST)

FIGURE 4-8: PROPOSED WALKERS LINE LAYOVER - BIRD'S EYE VIEW (LOOKING WEST)

FIGURE 4-9: EXISTING WALKERS LINE LAYOVER - VIEW FROM HARVESTER ROAD (LOOKING SOUTHEAST)

FIGURE 4-10: PROPOSED WALKERS LINE LAYOVER - VIEW FROM HARVESTER ROAD (LOOKING SOUTHEAST)

4.3.9 Utilities

A Utilities Assessment Report (refer to **Appendix I**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-132**.

4.3.9.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.9.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

4.3.9.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.9.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.9.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

Although track upgrades are proposed in this section as part of the NT&F TPAP, associated OCS infrastructure will be within areas that have already been assessed as part of the 2017 TPAP.

4.3.9.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.9.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.9.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

The following potential conflicts have been identified in **Table 4-26**. All conflicts identified below are to be confirmed pending further investigations. All assets within the Metrolinx layover site development area may need to be protected in place, removed, relocated and/or locally lowered with a casing pipe across all tracks. Reservicing of the site will be required.

TABLE 4-26: WALKERS LINE POTENTIALLY IMPACTED UTILITIES

UID	Site Names	Mile Start	Mile End	Nearest Street	Owner Name	Utility Class	Description	Size	Material
11414	Union Station; Lakeshore West; Burlington; Mimico TFF; Ordnance SWS	0.54	34.26	Lower Jarvis St to Waterdown Rd	Telus	UG - Parallel	Communication Cable	144F	Fiber
21126	Lakeshore West; Burlington	21.58	34.63	Lyons Lane to Waterdown Rd	Bell	UG - Parallel	Communication Cable	Unknown	Plastic
22168	Lakeshore West	28.43	28.45	Fairview St	City of Burlington	UG - Parallel	Storm Sewer	450mm	Concrete

UID	Site Names	Mile Start	Mile End	Nearest Street	Owner Name	Utility Class	Description	Size	Material
22169	Lakeshore West	28.45	28.49	Fairview St	City of Burlington	UG - Parallel	Storm Sewer	600mm	Concrete
22170	Lakeshore West	28.49	28.57	Fairview St	City of Burlington	UG - Parallel	Storm Sewer	900mm	Concrete
22171	Lakeshore West	28.57	28.65	Fairview St	City of Burlington	UG - Parallel	Storm Sewer	825mm	Concrete
21530	Lakeshore West	28.65	28.66	Appleby Line	Cogeco Connexion	UG - Crossing	Communication Cable	12F	Fiber
21383	Lakeshore West	29.01	29.01	Walkers Line	Halton Region	UG - Crossing	Sanitary Sewer	1370mm casing, 825mm pipe	Concrete in Steel Casing
21811	Lakeshore West	29.02	29.02	Griffith Ct	City of Burlington	UG - Crossing	Culvert	1200x 3200mm	Concrete

4.3.10 EMI & EMF

An EMI & EMF Assessment Report (refer to **Appendix J**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-133**.

Throughout this corridor, as with all other corridors under study for the impact assessment, the potential effects and mitigations are identical. This is true regardless of the presence of a layover facility in the territory.

4.3.10.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.10.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

4.3.10.2.1 Potential Effects and Mitigation Measures

The potential effects due to operating an electrified transit system for this segment are largely the result of overhead catenary wires to power the train, and the operation of 25kV aerial feeder lines to power the catenary. They are summarized as follows:

- EMI;
- Time-Varying EMFs;
- Induced Current in Neighbouring Metallic Wires, Fences, Pipelines, Cables, and Earth (grounding) Networks;
- Unintended Contact with High-Voltage Source; and
- ELF EMF.

The EMI would be the result of high frequency generated by the scraping of the pantograph down the catenary and the motors used to power the train. The EMFs would be the result of current flow down the catenary and within the passenger compartments of the train. The induced current would be the result of current flow down the catenary or the feeder wires. The unintended contact with the high-voltage source would be the result of access to the catenary, live wires inside the passenger compartment, or access to the feeder wires.

Mitigation for each of these potential effects has been implemented as part of the design of the system. In a general sense, for EMI, the power methodology for the Metrolinx system—auto-transformer power—has been selected specifically for its reduction of this type of interference. Additional mitigation methodologies include the following:

- Implementation and use of an EMC Control Plan.
- Proper design, e.g., grounding and shielding as per applicable Canadian electrical standards, physical separation, as identified from bench-marking similar properties across North America.
- During the electrification commissioning phase, overall ELF and RF emissions emanating from the GO electrified railway system as a whole will be field tested and verified to ensure EMFs are within the limits of applicable industry standards.
- Verify ELF EMF by measurements taken before and after project implementation.

4.3.10.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.10.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.10.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

Although track upgrades are proposed in this section as part of the NT&F TPAP, associated OCS infrastructure will be within areas that have already been assessed as part of the 2017 TPAP.

4.3.10.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.10.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.10.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

Potential effects and mitigation measures associated with EMI & EMF at this location are detailed in Section 4.3.10.2.

4.3.11 Stormwater Management

A Preliminary Stormwater Management Assessment (refer to **Appendix K**) has been prepared which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-134**.

4.3.11.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.11.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of detailed design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

4.3.11.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.11.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.11.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

Although track upgrades are proposed in this section as part of the NT&F TPAP, associated OCS infrastructure will be within areas that have already been assessed as part of the 2017 TPAP.

4.3.11.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.11.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.11.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed at Walkers Line Layover based on the preliminary analysis undertaken as part of the conceptual design work. Notwithstanding this, if environmental impacts are subsequently identified as part of Detailed Design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

For a more detailed discussion regarding anticipated Stormwater Management impacts and applicable mitigation measures at the proposed Walkers Line Layover Facility, please refer to the 2020 New Track & Facilities EPR. As electrification infrastructure is a component of this facility, stormwater management measures will be coordinated as part of future project phases.

4.3.12 Groundwater and Wells

A Hydrogeological Assessment Study (refer to **Appendix L**) has been prepared which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-135**.

4.3.12.1 OCS: Section LSW-1 – West of Bathurst Street (Mile 1.20) to Mimico Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.12.2 OCS: Section LSW-2 – Mimico Station to Long Branch Station

4.3.12.2.1 Potential Effects and Mitigation Measures

There are no anticipated footprint impacts of the proposed OCS in this section therefore no mitigation measures have been proposed.

4.3.12.3 OCS: Section LSW-3 – Long Branch Station to Port Credit Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.12.4 OCS: Section LSW-4 – Port Credit Station to Clarkson Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.12.5 OCS: Section LSW-5 – Clarkson Station to Oakville Station

Although track upgrades are proposed in this section as part of the NT&F TPAP, associated OCS infrastructure will be within areas that have already been assessed as part of the 2017 TPAP.

4.3.12.6 OCS: Section LSW-6 – Oakville Station to Bronte Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.12.7 OCS: Section LSW-7 – Bronte Station to Appleby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.3.12.8 OCS/New Layover Facility – Walkers Line Layover: Section LSW-8 – Appleby Station to Burlington (MP 31.5)

Shoreacres Creek is a permanent warmwater watercourse with a hardbottom shale bed with very little silt/sand and no organics. The creek appears to be predominantly runoff fed, with little groundwater baseflow, although this should be confirmed during detailed design. The infrastructure is not expected to have an impact on groundwater baseflow into the Creeks due to the

The subsurface footprint of the OCS foundations is relatively small (i.e., a few square metres) and shallow (i.e., approximately 5 metres deep) and therefore not expected to cause any adverse groundwater impacts on groundwater baseflow into the creek and the low anticipated groundwater contribution to streamflow under existing conditions.

The recharge of groundwater from infiltrating precipitation is not anticipated to be affected beyond what has already been assessed as part of the broader construction and operation of the layover facility as part of the NT&F TPAP. However, as the area is already highly developed, and the general low permeable of near surface soils across the general area, it is anticipated that infiltration is limited under current conditions.

Based on the above information, it is not anticipated that there will be adverse impacts due to the footprint of the OCS infrastructure to the groundwater supply wells or Shoreacres Creek and Tuck Creek. Therefore, no mitigation measures are recommended.

4.4 Kitchener Rail Corridor

4.4.1 Natural Environment

A Natural Environment Impact Assessment Report (refer to **Appendix A**) was prepared, which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-123** and **Table 4-124**.

4.4.1.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

4.4.1.1.1 Potential Effects and Mitigation Measures

4.4.1.1.1.1 Terrestrial

####### 4.4.1.1.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report prepared as part of the 2017 GO Rail Network Electrification TPAP. Impacts to the following communities were identified as part of the 2017 assessment: Commercial and Institutional (CVC), Transportation and Utilities (CVI), Mixed Meadow (MEM), Deciduous Woodland (WOD), and Cultural Meadow (CUM) communities. Additional vegetation removal areas within Section KT-1 associated with the additional OCS infrastructure are presented in **Table 4-27** and depicted in **Appendix A, Figure KT-1**.

The Transportation and Utility (CVI) lands that include the existing rail corridor are composed of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due to minimal canopy cover. Mitigation for CVI areas includes ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, minor additional vegetation removals within Commercial and Institutional (CVC), Cultural Meadow (CUM) and Mixed Meadow (MEM) will be required within the vegetation clearing zone. While vegetation removals are required within these areas, they are highly urbanized, and provide limited habitat for wildlife. Therefore, the removals within these areas are considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CVC, CUM and MEM communities, the extent of tree removals in these areas is minor. Mitigation for these areas includes compliance with the general mitigation measures for vegetation/tree clearing identified below.

Details relating to impacted areas within TRCA Regulated Areas can be found in Section 4.4.1.1.1.4.

TABLE 4-27: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES KT-1*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Commercial and Institutional (CVC)	0.0001	0	0.0001	Minor
Transportation and Utilities (CVI)	0.001	0	0.001	Minor
Mixed Meadow (MEM)	0.001	0	0.001	Minor
Cultural Meadow (CUM)	0.000003	0	0.000003	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

Mitigation Measures

Mitigation measures related to vegetation clearing consist of vegetation management as per the ***Metrolinx Vegetation Guideline*** (2020) and additional measures identified within Section 4.9. This corridor segment is within the Regulated Area for Asian Long-horned Beetle. As such, vegetation removals within the 12 genera identified as host trees must be carried out carried out in a manner in compliant with the Ministerial Order issued by the Federal Government in 2013 which identifies prohibitions and restrictions of movement on trees, leaves, logs, lumber, wood/wood chips from host species of the Asian Long-horned Beetle. Unless authorized by a Movement Certificate issued by the CFIA, moving these products out of the Regulated Area is prohibited.

- The following mitigation measures, which are common to all ELC communities, will be implemented to minimize/mitigate the potential impacts related to vegetation/tree removals: Vegetation management in accordance with Metrolinx's *Vegetation Guideline (2020)* will include:
  - **Detailed Tree Inventory** – All trees 10 centimetres or greater in diameter within the study area or with canopies or TPZ extending into the study area. SAR that may be directly impacted by the tree removal shall be identified during the tree inventory to the extent possible using tree inventory methods. This includes identification of tree SAR such as Butternut as well as information on the potential suitable habitat for SAR, such as the presence of bat cavity trees, where visible during the leaf-on period.
  - **Tree Protection** – Detailed measures to protect retained adjacent trees. This will include TPZ limits, diagram of tree protection barrier type, tree protection measures, and construction storage and staging areas where information is available.
  - **Vegetation Compensation** – Metrolinx has established a vegetation compensation approach for determining and implementing compensation for the removal of trees from the Metrolinx ROW as well as public and private lands. It is a landscape science-based approach designed to reflect the basic principles of the TRCA's ecosystem-based approach in addition to following the requirements of applicable bylaws. Compensation will follow one or a combination of the following approaches: ecological, baseline, or bylaw.
  - **For Trees within Metrolinx Property:** All trees within the Metrolinx ROW will be compensated for using either an ecological or baseline approach. Where tree removals are located within a designated natural area, ecological compensation will be implemented. Where removals are outside a designated natural area, a 1:1 ratio approach will be implemented (baseline compensation).
  - **For Public/Private Trees:** Compensation for trees within public and private lands, including those on the boundary between the Metrolinx ROW and public or private lands, will follow with the requirements of applicable bylaws. Trees on public or private lands that are not subject to bylaws/regulations will be compensated for following an ecological or baseline approach. Metrolinx will work directly with residents to address the loss of trees on private property.
  - **Tree End Use:** Options for the end use of trees removed from Metrolinx property (e.g. reuse/recycling options) will be developed as per the recommendations in the guideline.
- Metrolinx will make efforts to comply with the *Forestry Act* in relation to trees planted on the boundary between two lands (i.e., lands that are Metrolinx owned and lands that are not Metrolinx owned);
- Compliance with the *Migratory Birds Convention Act* (MBCA); and
- This corridor segment is within the Regulated Area for Asian Long-Horn Beetle. As such, vegetation removals within the 12 genera identified as host trees must be carried out in a manner in

compliance with the Ministerial Order issued by the Federal Government in 2013 which identifies prohibitions and restrictions of movement on trees, leaves, logs, lumber, wood/wood chips from host species of the Asian Long-horned Beetle. Unless authorized by a Movement Certificate issued by the CFIA, moving these products out of the Regulated Area is prohibited.

4.4.1.1.1.2 Aquatic

There is one watercourse within the track upgrade area: Mimico Creek. No adverse effects to this creek are anticipated to result from the installation of OCS structures as they are located within the existing corridor ROW away from the watercourse. To mitigate the potential indirect impacts to the watercourse, sediment and erosion controls will be implemented and required precautions will be taken to prevent spills and the release of hazardous materials.

4.4.1.1.1.3 Species at Risk

Given the low potential of occurrence for Chimney Swift, Nine-spotted Lady Beetle, and Snapping Turtle there are no anticipated footprint impacts to these species.

While Monarch has a moderate potential of occurrence in the MEM community, the removal of a small amount of herbaceous vegetation within the MEM communities is considered minor in relation to the amount of adjacent un-impacted habitat and removals are not anticipated to have an impact on this species.

The Mimico Creek Bridge (Weston Sub Mile 13.7) was previously surveyed for active nests and individuals as part of the 2017 TPAP. No Barn Swallow nests or individuals were observed at this site and no evidence of Barn Swallow nesting was found; therefore, there are no anticipated impacts.

There is a low potential for Western Chorus Frog (a SAR protected on Federal lands only) within the impacted MEM community. Vegetation clearing may result in a net loss of vegetation along the perimeter of the MEM but will not impact any specialized amphibian habitat as the areas adjacent to the corridor are not conducive to breeding or hibernation areas.

4.4.1.1.1.4 Designated Areas

Additional footprint impacts to CVI, CVC, CUM and MEM areas within TRCA areas are identified in **Table 4-28**. Impacts to these vegetation communities are discussed within Section 4.4.1.1.1. No vegetation clearing within the TRCA Regulated area is required within any of these communities outside of the Metrolinx owned ROW.

Metrolinx has established a Vegetation Compensation framework within the ***Vegetation Guideline*** *(*2020*)* for Metrolinx undertakings and vegetation that is removed will be compensated for in accordance with the provisions of this framework.

TABLE 4-28: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN DESIGNATED AREAS KT-1*

ELC Community	TRCA Regulation Limit			Extent of Tree Removals (based on canopy cover within ELC community)
	Inside Metrolinx owned ROW (ha)	Outside Metrolinx owned ROW (ha)	Total Area (ha)	
Commercial and Institutional (CVC)	0.00001	0	0.00001	Minor
Transportation and Utilities (CVI)	0.0002	0	0.0002	Minor
Mixed Meadow (MEM)	0.001	0	0.001	Minor
Cultural Meadow (CUM)	0.000003	0	0.000003	Minor

**areas are approximations for discussion purposes only and not based on surveyed data*

4.4.1.2 OCS: Section KT-2 – Malton Station to Bramalea Station

4.4.1.2.1 Potential Effects and Mitigation Measures

4.4.1.2.1.1 Terrestrial

####### 4.4.1.2.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report prepared as part of the 2017 GO Rail Network Electrification EPR. Impacts to the following communities were identified as part of the 2017 assessment: Commercial and Institutional (CVC), Transportation and Utilities (CVI), Residential (CVR), Meadow Marsh (MAM) and Cultural Meadow (CUM) communities.

Additional vegetation removal areas within Section KT-2 associated with the new OCS infrastructure are presented in **Table 4-29** and depicted in **Appendix A, Figures KT-4** to **KT-5**.

The Transportation and Utility (CVI) lands that include the existing rail corridor are comprised of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due to minimal canopy cover. Mitigation for CVI areas include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, vegetation removals within several other ELC communities including Cultural Meadow (CUM), Commercial and Institutional (CVC), and Meadow Marsh (MAM) will be required within the vegetation clearing zone. While vegetation removals are required within these areas, they provide limited habitat for wildlife. Therefore, the removals within these areas are considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CUM, MAM, and CVC communities, the extent of tree removals in these areas is minor.

Details relating to impacted areas within Toronto and Region Conservation Authority (TRCA) Regulated Areas are found in Section 4.4.1.2.1.4.

TABLE 4-29: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES KT-2*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Commercial and Institutional (CVC)	0	0.246	0.246	Minor
Transportation and Utilities (CVI)	0.069	0.287	0.356	Minor
Meadow Marsh (MAM)	0.160	0	0.160	Minor
Cultural Meadow (CUM)	0.060	0.036	0.096	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

Mitigation Measures

Mitigation measures related to vegetation clearing consist of vegetation management as per the Metrolinx's *Vegetation Guideline* (2020) and additional measures detailed in Section 4.4.1.1.1.1.1. This corridor segment is within the Regulated Area for Asian Long-horned Beetle. As such, vegetation removals within the 12 genera identified as host trees must be carried out carried out in a manner in compliant with the Ministerial Order issued by the Federal Government in 2013 which identifies prohibitions and restrictions of movement on trees, leaves, logs, lumber, wood/wood chips from host species of the Asian Long-horned Beetle. Unless authorized by a Movement Certificate issued by the CFIA, moving these products out of the Regulated Area is prohibited.

4.4.1.2.1.2 Aquatic

There is one crossing of Mimico Creek (Tributary of Mimico Creek) within the upgraded/new track areas. This crossing of Mimico Creek (Tributary of Mimico Creek) is conveyed under the corridor by a culvert; therefore, no footprint impacts to the culvert or watercourse are anticipated to result from the installation of OCS within the existing corridor above the culvert. To mitigate the potential indirect impacts to the watercourses, sediment and erosion controls will be implemented and required precautions will be taken to prevent spills and the release of hazardous materials.

4.4.1.2.1.3 Species at Risk

Given the low potential of occurrence to Chimney Swift, Monarch, Nine-spotted Lady Beetle, and Snapping Turtle, there are no anticipated footprint impacts to these species.

4.4.1.2.1.4 Designated Areas

Additional footprint impacts to CVI and CUM areas within TRCA areas are identified in **Table 4-30**. Impacts to these vegetation communities have been discussed within Section 4.4.1.2.1.1**.** No vegetation clearing within the TRCA Regulated Area within these communities will occur outside of the existing Metrolinx owned ROW. There are no additional footprint impacts to MAM or CVC communities within TRCA areas.

Metrolinx has established a Vegetation Compensation framework within the ***Vegetation Guideline*** (2020) for Metrolinx undertakings and vegetation that is removed will be compensated in accordance with the provisions of this framework.

TABLE 4-30: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN DESIGNATED AREAS KT-2*

ELC Community	TRCA Regulation Limit			Extent of Tree Removals (based on canopy cover within ELC community)
	Area inside ROW (ha)	Area outside ROW (ha)	Total Area (ha)	
Commercial and Institutional (CVC)	0	0	0	N/A
Transportation and Utilities (CVI)	0.002	0	0.002	Minor
Cultural Meadow (CUM)	0.005	0	0.005	Minor
Meadow Marsh (MAM)	0	0	0	N/A

**areas are approximations for discussion purposes only and not based on surveyed data*

4.4.2 Preliminary Environmental Site Assessment

A Preliminary Environmental Site Assessment (refer to **Appendix B**) was prepared for new layover facilities. A summary of mitigation and monitoring commitments for this section is included in **Table 4-125**.

4.4.2.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

4.4.2.2 OCS: Section KT-2 – Malton Station to Bramalea Station

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

4.4.3 Built Heritage Resources and Cultural Heritage Landscapes

Please refer to **Appendix C1** for a description of methodology followed for assessment of Cultural Heritage impacts. Additional details can be found in the Cultural Heritage Technical Memo contained in **Appendix C1**. A summary of mitigation and monitoring commitments for this section is included in **Table 4-126**.

4.4.3.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

4.4.3.1.1 Potential Effects and Mitigation Measures

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.4.3.2 OCS: Section KT-2 – Malton Station to Bramalea Station

4.4.3.2.1 Potential Effects and Mitigation Measures

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.4.4 Archaeology

A Stage 1 Archaeological Assessment Report (refer to **Appendix D**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-127**.

4.4.4.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

4.4.4.1.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed there are no anticipated impacts of the proposed OCS infrastructure in this section, therefore no mitigation measures have been proposed.

4.4.4.2 OCS: Section KT-2 – Malton Station to Bramalea Station

4.4.4.2.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2, the area does not retain archaeological potential. No further archaeological assessment is required. No mitigation measures are required.

4.4.5 Land Use and Socio-Economic

A Land Use and Socio-Economic Assessment Report (refer to **Appendix E**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-128**.

4.4.5.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

4.4.5.1.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area will be located in the City of Mississauga within the rail ROW in this section, though there are some areas where engineering solutions will be required to keep OCS structures within the ROW. The proposed design solutions and where they will occur will be finalized in the Detailed Design phase of the Project. There are no expected footprint effects as a result of this activity.

Mitigation Measures

No mitigation measures are required.

4.4.5.1.2 Socio-Economic – Potential Effects and Mitigation Measures

There are no sensitive facilities adjacent to the additional OCS infrastructure area, and therefore there are no effects anticipated.

Paul Coffey Park (formerly Wildwood Park) is the only large park that borders this section of the rail corridor. There are no anticipated adverse effects anticipated due to the implementation of the electrification infrastructure identified as part of the conceptual design developed for the Significant Addendum to the Electrification TPAP. Notwithstanding this, potential conflicts with recreational amenities will be reviewed in further detail during detailed design, and if required, the City of Mississauga will be consulted to determine appropriate design solutions to mitigate/minimize any effects to recreational amenities.

Other potential effects on the socio-economic environment associated with the KT-1 corridor were assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.4.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.4.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*

- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.4.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.4.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

The mitigation measures outlined in the respective sections/reports listed above for Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF will be adhered to and implemented during Detailed Design and construction.

4.4.5.2 OCS: Section KT-2 – Malton Station to Bramalea Station

4.4.5.2.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area required in this section is located in the City of Brampton at the Bramalea GO Station. Additional property requirements were identified as part of the NT&F TPAP in order to accommodate proposed project infrastructure. The area immediately surrounding the station is zoned *Employment/Industrial* land use. Given the site's existing use as a GO Station, this facility is consistent with existing and adjacent uses.

Mitigation Measures

The additional OCS infrastructure area is located in an area of compatible land use with the existing land use and zoning of the property. A range of municipal permits and approvals may be required, and if so, Metrolinx will obtain all required permits and approvals. However, further coordination with the City of Brampton will be undertaken during future project phases to finalize design details and minimize any conflicts on adjacent uses. Metrolinx is currently in discussions with the landowners regarding the use of this property and will reach an agreement prior to the commencement of construction activities.

4.4.5.2.2 Socio-Economic – Potential Effects and Mitigation Measures

There are no sensitive facilities adjacent to the additional OCS infrastructure area, and therefore there are no effects anticipated.

There are no recreational amenities within proximity of the additional OCS infrastructure area.

Other potential effects on the socio-economic environment associated with the KT-2 corridor have been assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.4.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.4.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*
- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.4.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.4.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

Ensure that the mitigation recommendations outlined in the respective reports listed above pertaining to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF are adhered to and implemented during Detailed Design and construction.

4.4.6 Air Quality

The assessment of potential air quality effects within this corridor is detailed in **Appendix F3**. A summary of mitigation and monitoring commitments for this section is included **Table 4-129**.

The highest predicted cumulative concentrations at the worst-case receptor, under worst-case meteorological conditions and reasonably worst-case background air quality conditions are summarized in **Table 4-31** (Baseline Scenario) and **Table 4-32** (Future Scenario).

Some of the contaminants are predicted to exceed standards or criteria at the worst-case receptor, as follows:

- 1-hour and 24-hour NO_2 meet the current Ontario AAQC's, but 1-hour and annual average NO_2 do not meet the more recent and more stringent Canadian Ambient Air Quality Standards (CAAQS) in either the Baseline or Future Scenario.
- 24-hour and annual average Benzo(a)pyrene exceed the provincial AAQCs in both scenarios.
- 24-hour Benzene meets the AAQC in both scenarios, but the annual average Benzene does not in either scenario.

$PM_{2.5}$, PM_{10}, Acrolein, Carbon Monoxide, Formaldehyde, Acetaldehyde, and 1,3-Butadiene are all predicted to be within the provincial air quality criteria (AAQCs) in both the Baseline and Future Scenario. As mentioned previously, the AAQCs and CAAQS represent desirable levels, rather than statutory limits. Measures mandated to achieve the CAAQS should consider technical achievability, practicality and implementation costs (CCME, 2019).

Figure 4-11 and **Figure 4-12** show where the worst-case receptors are located for the contaminants that exceed an AAQC or CAAQS. They are immediately adjacent to the rail corridor.

Table 4-33 shows the range of predicted cumulative 1-hour concentrations of NO_2 at the 4 representative receptor locations. The maximum/minimum concentrations shown in the table are maximum/minimum values over the 5-year period of the simulation. Similarly, mean values are 5-year mean values. All values in the table include hourly 90^{th} percentile background concentrations.

The table shows that, at most of the representative receptors, the maximum hourly concentrations increase by 14% to 62% between the Baseline and Future Scenario, but the mean and median concentrations change by less than 10%, except at Receptors 1, 2, 9, and 10 (receptors directly adjacent to the tracks), where the mean increases between 16% and 22%, respectively.

Table 4-34 shows the contributions of Metrolinx-related emission sources and background sources to the average cumulative NO_2 concentrations at the representative receptors. The background concentrations shown in this table are average levels, rather than 90th percentile. The Metrolinx contributions shown in the table include a very small contribution from other trains on the corridor as well (VIA Rail and freight).

The table shows that the average NO_2 concentration is dominated by the background contribution at all receptors, except Receptors 2 and 9 in the Future Scenario, where the concentration is dominated by the rail corridor. The average contribution of Metrolinx-related emission sources is higher in the Future Scenario than in the Baseline Scenario, but remains small compared to background, except at Receptors 2 and 9, which are adjacent to the rail corridor.

Table 4-35 shows the individual contributions of Metrolinx-related emission sources and background sources to the predicted average cumulative Benzene concentrations. The predicted average concentrations of Benzene are dominated by the background contribution. The contribution from Metrolinx-related emission sources to the cumulative Benzene concentrations is small. In the Future Scenario, it is 9% at Receptors 2 and 9, and less than 7% at all other representative receptors. The overall cumulative Benzene concentration at all receptors increases by approximately 1-9% at all representative receptors between the Baseline and Future Scenarios.

Table 4-36 shows the same information as Table 14, but for Benzo(a)Pyrene. The average concentrations are dominated by the background sources. Like Benzene, the contribution of Metrolinx related sources to the cumulative concentrations of Benzo(a)Pyrene is small. In the Future Scenario, it is approximately 5% at Receptor 2 and 9, and less than 4% at all other representative receptors. Similar to Benzene, the overall cumulative concentration at all representative receptors increase by approximately 1-4% between the Baseline and Future Scenarios.

TABLE 4-31: MAXIMUM MODELLED CONCENTRATIONS FOR BASELINE (2015) SCENARIO

Pollutant	Averaging Time	Contribution from Modelled Sources (µg/m³)	Ambient Background Level (µg/m³)	Maximum Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criterion
AAQC						
NO_2	1 hour	28	56	84	400	21%
	24 hours	5.4	41	46	200	23%
Acrolein	1 hour	0.051	0.12	0.17	4.5	3.8%
	24 hours	0.011	0.07	0.079	0.4	20%
CO	1 hour	13	219	232	36200	0.6%
	8-hr	3.9	1189	1193	15700	7.6%
PM_{10}	24 hours	0.19	26	26	50	52%
Benzene	24 hours	0.023	0.80	0.84	2.3	36%
	Annual	0.0075	0.52	0.53	0.45	118%
B(a)pyrene	24 hours	1.1E-06	9.5E-05	9.6E-05	5.0E-05	192%
	Annual	3.5E-07	5.5E-05	5.5E-05	1.0E-05	554%
Formaldehyde	24 hours	0.14	3.5	3.6	65	6%
Acetaldehyde	24 hours	0.049	1.7	1.8	500	0.4%
1,3-Butadiene	24 hours	0.00094	0.07	0.068	10	0.7%
	Annual	0.00030	0.039	0.040	2.0	2.0%
CAAQS [2]						
NO_2	1 hour (2020)	28	56	84	119	71%
	1 hour (2025)	28	56	84	83	101%
	Annual (2020)	1.7	28	47	34	139%
	Annual (2025)	1.7	28	47	24	197%
$PM_{2.5}$	24 hours	0.13	14	14	27	52%
	Annual	0.059	8.0	8.1	8.8	92%

[3] Background levels based on difference between receptor concentration with and without background concentrations in model
[4] Results averaged based on CAAQS averaging periods described in Table 1.

TABLE 4-32: MAXIMUM MODELLED CONCENTRATIONS FOR FUTURE SCENARIO

Pollutant	Averaging Time	Contribution from Modelled Sources (µg/m³)	Ambient Background Level (µg/m³)	Maximum Cumulative Concentration (µg/m³)	Threshold (µg/m³)	Percentage of Criteria
AAQC						
NO_2	1 hour	81	47	128	400	32%
	24 hours	32	41	73	200	36%
Acrolein	1 hour	0.18	0.12	0.3	4.5	7%
	24 hours	0.064	0.07	0.13	0.4	33%
CO	1 hour	44	219	263	36200	0.7%
	8-hr	24	1189	1213	15700	7.7%
PM_{10}	24 hours	1.1	26	27	50	54%
Benzene	24 hours	0.14	0.80	0.94	2.3	41%
	Annual	0.055	0.52	0.58	0.45	129%
B(a)pyrene	24 hours	7.0E-06	9.5E-05	1.0E-04	5.0E-05	204%
	Annual	2.7E-06	5.5E-05	5.8E-05	1.0E-05	577%
Formaldehyde	24 hours	0.84	3.5	4.3	65	7%
Acetaldehyde	24 hours	0.30	1.7	2.0	500	0.4%
1,3-Butadiene	24 hours	0.0058	0.07	0.1	10	0.7%
	Annual	0.0022	0.039	0.041	2.0	2.1%
CAAQS [2]						
NO_2	1 hour (2020)	81	45	126	119	106%
	1 hour (2025)	81	45	126	83	152%
	Annual (2020)	32	28	58	34	171%
	Annual (2025)	32	28	58	24	242%
$PM_{2.5}$	24 hours	0.83	14	15	27	55%
	Annual	0.43	8.0	8.5	8.8	96%

[3] Background levels based on difference between receptor concentration with and without background concentrations in model
[4] Results averaged based on CAAQS averaging periods described in Table 1.

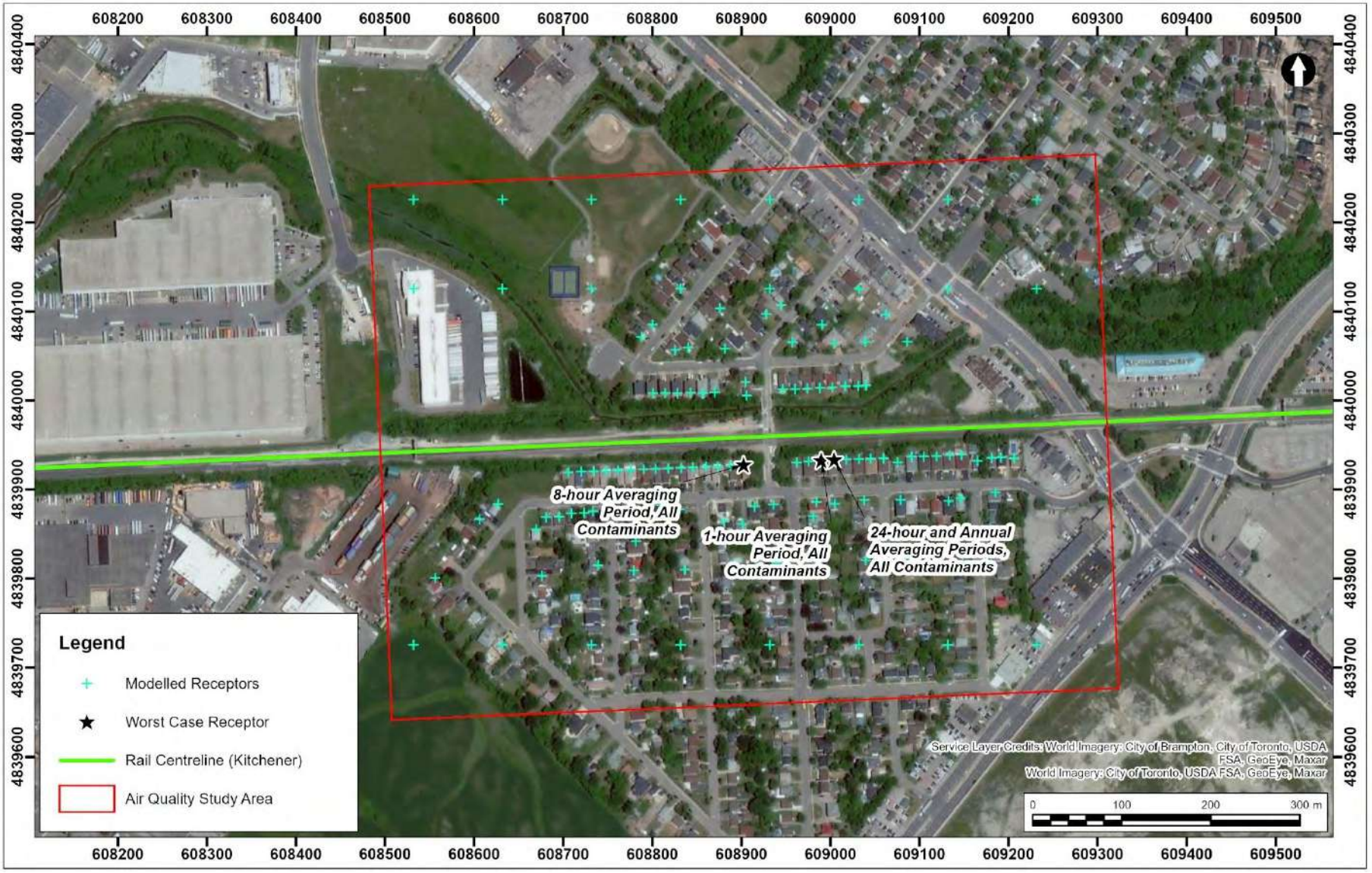

FIGURE 4-11: LOCATION OF WORST-CASE AIR QUALITY RECEPTORS IN BASELINE SCENARIO

FIGURE 4-12: LOCATIONS OF WORST-CASE AIR QUALITY RECEPTORS IN FUTURE SCENARIO

TABLE 4-33: RANGE OF PREDICTED CUMULATIVE 1-HOUR NO_2 AT SELECTED AIR QUALITY RECEPTORS

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	Hourly Concentration (µg/m³)			
				Maximum	Mean	Median	Minimum
Baseline	1	1.5	55	75	46	47	34
	2	1.5	30	84	47	48	34
	3	1.5	95	69	46	46	34
	4	1.5	145	67	45	46	34
	5	1.5	130	66	45	46	34
	6	1.5	245	65	45	46	34
	7	1.5	175	65	45	46	34
	8	1.5	255	63	45	46	34
	9	1.5	30	84	47	48	34
	10	1.5	45	77	46	48	34
Future	1	1.5	55	118	53	50	34
	2	1.5	30	128	57	53	34
	3	1.5	95	95	50	49	34
	4	1.5	145	87	47	48	34
	5	1.5	130	84	49	49	34
	6	1.5	245	78	47	48	34
	7	1.5	175	78	48	49	34
	8	1.5	255	72	47	48	34
	9	1.5	30	128	57	53	34
	10	1.5	45	125	55	51	34
Ontario AAQC				**400 (1-hr), 200 (24-hr)**			
2020 CAAQS				**119 (98th percentile daily max 1-hr)**			
2025 CAAQS				**83 (98th percentile daily max 1-hr)**			

TABLE 4-34: SOURCE CONTRIBUTIONS TO AVERAGE NO_2 AT SELECTED AIR QUALITY RECEPTORS

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m³)		
				Metrolinx-related Sources	Background	Total
Baseline	1	1.5	55	1.1	28	29
	2	1.5	30	1.7	28	30
	3	1.5	95	0.6	28	29
	4	1.5	145	0.3	28	28
	5	1.5	130	0.4	28	28
	6	1.5	245	0.2	28	28
	7	1.5	175	0.3	28	28
	8	1.5	255	0.2	28	28
	9	1.5	30	1.7	28	30
	10	1.5	45	1.3	28	29
Future	1	1.5	55	8	28	36
	2	1.5	30	12	28	40
	3	1.5	95	5	28	33
	4	1.5	145	2	28	30
	5	1.5	130	3	28	31
	6	1.5	245	2	28	30
	7	1.5	175	2	28	30
	8	1.5	255	2	28	30
	9	1.5	30	12	28	40
	10	1.5	45	9	28	37
2020 CAAQS				**34 (Annual Average)**		
2025 CAAQS				**24 (Annual Average)**		

TABLE 4-35: SOURCE CONTRIBUTIONS TO AVERAGE BENZENE AT SELECTED AIR QUALITY RECEPTORS

Scenario	Receptor	Height above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)		
				Metrolinx-related Sources	Background	total
Baseline	1.5	1	55	0.0048	0.52	0.52
	1.5	2	30	0.0073	0.52	0.53
	1.5	3	95	0.0027	0.52	0.52
	1.5	4	145	0.0014	0.52	0.52
	1.5	5	130	0.0019	0.52	0.52
	1.5	6	245	0.0009	0.52	0.52
	1.5	7	175	0.0014	0.52	0.52
	1.5	8	255	0.0009	0.52	0.52
	1.5	9	30	0.0072	0.52	0.53
	1.5	10	45	0.0056	0.52	0.53
Future	1.5	1	55	0.036	0.52	0.56
	1.5	2	30	0.053	0.52	0.57
	1.5	3	95	0.0212	0.52	0.54
	1.5	4	145	0.0109	0.52	0.53
	1.5	5	130	0.0153	0.52	0.54
	1.5	6	245	0.0073	0.52	0.53
	1.5	7	175	0.0112	0.52	0.53
	1.5	8	255	0.0073	0.52	0.53
	1.5	9	30	0.0526	0.52	0.57
	1.5	10	45	0.0412	0.52	0.56
	Ontario AAQC			**0.45 (annual mean)**		

TABLE 4-36: SOURCE CONTRIBUTIONS TO AVERAGE BENZO(A)PYRENE AT SELECTED AIR QUALITY RECEPTORS

Scenario	Receptor	Height above Grade (m)	Distance from Tracks (m)	Annual Average Concentration (ng/m^3)		
				Metrolinx-related Sources	Background	Total
Baseline	1	1.5	55	2.36E-04	0.055	0.055
	2	1.5	30	3.61E-04	0.055	0.055
	3	1.5	95	1.32E-04	0.055	0.055
	4	1.5	145	6.48E-05	0.055	0.055
	5	1.5	130	9.15E-05	0.055	0.055
	6	1.5	245	4.16E-05	0.055	0.055
	7	1.5	175	6.55E-05	0.055	0.055
	8	1.5	255	4.18E-05	0.055	0.055
	9	1.5	30	3.56E-04	0.055	0.055
	10	1.5	45	2.73E-04	0.055	0.055
Future	1	1.5	55	1.75E-03	0.055	0.057
	2	1.5	30	2.60E-03	0.055	0.058
	3	1.5	95	1.02E-03	0.055	0.056
	4	1.5	145	5.03E-04	0.055	0.056
	5	1.5	130	7.22E-04	0.055	0.056
	6	1.5	245	3.45E-04	0.055	0.055
	7	1.5	175	5.27E-04	0.055	0.056
	8	1.5	255	3.45E-04	0.055	0.055
	9	1.5	30	2.57E-03	0.055	0.058
	10	1.5	45	2.00E-03	0.055	0.057
Ontario AAQC				**0.01 (annual mean)**		

4.4.6.1 Potential Effects and Mitigation Measures

Concentrations of relevant air contaminants were predicted under worst-case meteorological conditions and reasonably worst-case background air quality conditions. This was done for numerous receptor locations, so that the worst-case receptor location(s) could be identified. The analysis was performed for a 2025 horizon year, using rail service levels that were projected to approximately 2037, with a 10% margin of safety applied on top.

Some of the contaminants are predicted to exceed standards or criteria at the worst-case receptor, as follows:

- $PM_{2.5}$, PM_{10}, Acrolein, Carbon Monoxide, Formaldehyde, Acetaldehyde, and 1,3-Butadiene are all predicted to be within the provincial air quality criteria (AAQCs) in both the Baseline and Future Scenario.
- 1-hour and 24-hour NO_2 meet the current Ontario AAQC's, but 1-hour and annual average NO_2 do not meet the more recent and more stringent Canadian Ambient Air Quality Standards (CAAQS) in either the Baseline or Future Scenario.
- 24-hour and annual average Benzo(a)pyrene exceed the provincial AAQCs in both scenarios.

- 24-hour Benzene meets the AAQC in both scenarios, but the annual average Benzene does not in either scenario.

As mentioned previously, the AAQCs and CAAQS represent desirable levels, rather than statutory limits. Measures mandated to achieve the CAAQS should consider technical achievability, practicality and implementation costs (CCME, 2019).

Further examination of the model results for NO_2 showed that the cumulative concentrations decline sharply within the first 150 m from the rail corridor. The predicted future daily maximum 1-hour NO_2 levels (98th percentile) fall within the 2020 CAAQS objective at approximately 50 m from the rail corridor, and within the 2025 CAAQS objective at approximately 100 m from the rail corridor.

The predicted future annual average concentrations remain above the 2020 and 2025 CAAQS objective at all distances within the study area. This is because the background level of annual NO_2 used in the analysis is above the 2025 CAAQS objective.

A detailed examination of predicted cumulative NO_2 concentrations at 10 representative receptors showed that the maximum hourly concentrations increase by 14% to 62% between the Baseline and Future Scenario, but the mean and median concentrations change by less than 10%, except at ground-level locations immediately adjacent to worst-case areas of the corridor (Receptors 1, 2, 9, and 10).

The predicted hourly concentrations in the Future Scenario are below the 2020 CAAQS level just below 99% of the time at Receptors 2 and 9, which are adjacent to the rail corridor, and 100% of the time at all the other representative receptors. They are below the 2025 CAAQS level approximately 96% to 99% of the time at Receptors 1, 2, 9, and 10, and 100% of the time at all other representative receptors

The average cumulative NO_2 concentrations at the representative receptors are dominated by the background contribution, except Receptor 1 in the Future Scenario, where the cumulative concentration is dominated by the rail corridor. The average contribution of Metrolinx-related emission sources is higher in the Future Scenario than in the Baseline Scenario but remains small compared to background (approximately 14% or less), except at Receptors 1, 2, 9, and 10, which are adjacent to the corridor.

Further examination of the model results for Benzene and Benzo(a)pyrene showed that the predicted contribution of Metrolinx-related sources to the cumulative concentrations is very small (generally less than 10%).

4.4.7 Noise and Vibration

The assessment of potential noise and vibration effects within this corridor is detailed in **Appendix G3**. **Appendix O3** provides maps showing the locations of receptors and recommended noise and vibration mitigation. A summary of mitigation and monitoring commitments for this section is included in **Table 4-130**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.3.

4.4.7.1 Operational Noise Assessment

The predicted Adjusted Noise Impacts for the project are summarized in **Table 4-37**, and the locations of the “segments” are presented in **Figure 3-10**.

Impact ratings for the evaluated 5 representative receptors for the rail operations listed in the table can be summarised as follows:

- 4 daytime Adjusted Noise Impacts were classified as significant (i.e., between 5 and 9.99 dB);
- 1 daytime Adjusted Noise Impacts were classified as noticeable (i.e., between 3 and 4.99 dB);and
- 5 nighttime Adjusted Noise Impacts were classified as significant (i.e., between 5 and 9.99 dB).

Mitigation measures were investigated for all receptors where the Adjusted Noise Impacts were predicted to be significant or very significant.

TABLE 4-37: SUMMARY OF ADJUSTED NOISE IMPACTS

Segment	Adjusted Impact Rating[1]	Average Objective (dB)[2]		Average Adjusted Noise Impact (dB)		Investigate Mitigation? [4]
		Daytime[3]	Nighttime[3]	Daytime[3]	Nighttime[3]	
Malton GO to Bramalea GO	Very Significant	-	-	-	-	Yes
	Significant	57.4	53.9	7.7	6.8	
	Noticeable	55.0	-	4.8	-	
	Insignificant	-	-	-	-	

Notes: [1] Ratings are quantified as: Insignificant – Less than 3 dB, Noticeable – 3 dB to 4.99 dB, Significant – 5 to 9.99 dB.
[2] The objective is the higher of either the Pre-project sound level or the 55 / 50 dBA default day/night sound levels.
[3] Daytime is a 16-hour period (i.e., from 0700h to 2300h) and Nighttime is an 8-hour period (i.e., from 2300h to 0700h).
[4] The potential to mitigate is considered when an increase of 5 dB or greater, relative to the objective level, is predicted as per the MOEE/GO Protocol. Such an increase is considered significant (or greater). An Adjusted Noise Impact greater than 5 dB requires the investigation of mitigation.

The predicted sound levels from the electric traction power facilities, were evaluated at nearby receptors and are summarized in **Table 4-38**. The predicted sound levels from the electric traction power facilities at nearby receptors were below the applicable limits; therefore, no mitigation measures were investigated for these facilities.

TABLE 4-38: PREDICTED SOUND LEVELS FROM ELECTRIC TRACTION POWER FACILITIES

Electric Traction Power Facility	Receptor ID	Evaluation Location	Period	Predicted Sound Levels	Applicable Limit	Compliance with Applicable Limit
				(dBA)	(dBA)	(Yes/No)
Bramalea PS	R06	Plane of Window	Daytime\Evening	31	50	Yes
			Nighttime	31	45	Yes
		Outdoor Area	Daytime\Evening	30	50	Yes

Notes: [1] Daytime occurs from 0700-1900h. Evening occurs from 1900h-2300h. Nighttime occurs from 2300-0700h.

A summary of all the barriers investigated and the results of the technical feasibility, constructability and economic feasibility studies can be found in **Table 4-39**. The noise barrier must achieve a minimum reduction of 5 dB to be considered technically feasible (from an acoustics perspective). To achieve a 5 dB reduction at receptors, a 5 m preliminary noise barrier was modelled at the ROW between the rail and receptors. If the 5 dB reduction was not achieved a 6 m then 7 m barrier was considered.

TABLE 4-39: SUMMARY OF BARRIER FEASIBILITY

Barrier	Figure[77]	Technical Feasibility (5 dB Reduction)	Constructability	Economic Feasibility	Overall Feasibility
Mit_BARR_01	G.1.1	Yes	No[1]	N/A	No
Mit_BARR_02	G.1.1	No	N/A	N/A	No
Mit_BARR_03	G.1.1	No	N/A	N/A	No
Mit_BARR_04	G.1.1	Yes	Yes	Yes	Yes
Mit_BARR_05	G.1.1	Yes	Yes	No	No
Mit_BARR_06	G.1.1	Yes	Yes	No	No
Mit_BARR_07	G.1.1	Yes	Yes	Yes	Yes
Summary					

[77] Figures referenced are included in **Appendix G3.**

Barrier	Figure[77]	Technical Feasibility (5 dB Reduction)	Constructability	Economic Feasibility	Overall Feasibility
Number of "Yes"		5	4	2	2
Number of "No"		2	1	2	5
Number "Not Assessed"		0	1	3	0

Notes: [1] Cannot obstruct access on east end of barrier. Shortening barrier results in non-technically feasible barrier.

4.4.7.2 Operational Vibration Assessment

Where sensitive receptors fall within areas of influence where operational vibration levels are expected to exceed the MOEE/GO Protocol vibration limits, mitigation is recommended. There are no areas where operational vibration levels are expected to exceed the MOEE/GO Protocol vibration limits at receptors.

4.4.7.3 Potential Effects and Mitigation Measures

Operational Noise Assessment

Adjusted Noise Impacts were determined in accordance with the MOEE/GO Protocol. Adjusted Noise Impacts along most of the study area was either significant (i.e., between +5 dB and + 10 dB) or very significant (i.e., greater than +10 dB). Mitigation was investigated for these areas and determined to be technically and economically feasible for 2 barriers (Mit_BARR_04 and Mit_BARR_07), spanning approximately 1 km.

For electric traction power facilities, the predicted noise levels at nearby receptors were below the applicable limits. Therefore, noise mitigation for electric traction power facilities was not required.

Operational Vibration Assessment

Predicted vibration effects of some trackwork and switches were found to meet the MOEE/GO Protocol limits. No vibration mitigation was recommended.

4.4.8 Visual

A Visual Assessment Report (refer to **Appendix H**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-131**.

4.4.8.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

4.4.8.1.1 Potential Effects and Mitigation Measures

This section is comprised of *Employment/Industrial* uses; therefore, it is classified as having *Negligible* visual impacts. Additionally, the additional OCS infrastructure is to occur within the existing Metrolinx rail ROW.

A *Parks/Open Space* area extends to the north and south of the rail corridor near Highway 427. The additional OCS infrastructure will be located within the rail ROW; therefore, there are no visible effects anticipated, and the *Open Space* area is classified as a *Negligible* visual impact. Otherwise, the remainder of this section is designated as *Employment/Industrial* or *Utilities/Transportation* and is also classified as a *Negligible* visual impact (see example in **Figure 4-13**: below).

There are no anticipated impacts from the proposed additional OCS infrastructure in this section; therefore, no mitigation measures have been proposed.

FIGURE 4-13: KITCHENER CORRIDOR – VIEW OF EXISITNG TRACKS NEAR INDUSTIRAL AREA (LOOKING EAST)

4.4.8.2 OCS: Section KT-2 – Malton Station to Bramalea Station

4.4.8.2.1 Potential Effects and Mitigation Measures

This section is comprised primarily of *Employment/Industrial* uses; therefore, according to the visual impact criteria, this segment is classified as having *Negligible* visual impacts.

The corridor extends into the City of Brampton, where much of the surrounding area is designated as a *Parkway Belt Plan* area and *Employment/Industrial*. The surrounding area is classified as a *Negligible* visual impact as the additional OCS infrastructure is to occur within the existing Metrolinx rail ROW (see **Figure 4-14** below).

The latter section comprises the Bramalea GO Station and is entirely designated as an *Employment/Industrial* area. Therefore, this section is classified as having *Negligible* visual impacts due to existing *Industrial* uses in the surrounding area. Bramalea GO Station passengers are not expected to experience additional visual impacts beyond what was previously documented in the 2017 GO Rail Network Electrification EPR due to the *Industrial* area where the existing Metrolinx rail ROW exists as part of the general visual environment.

There are no additional anticipated impacts from the proposed OCS infrastructure in this section; therefore, no mitigation measures have been proposed.

FIGURE 4-14: KITCHENER CORRIDOR – VIEW OF EXISTING TRACKS WITHIN ROW (LOOKING WEST)

4.4.9 Utilities

A Utilities Assessment Report (refer to **Appendix I**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-132**.

4.4.9.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

4.4.9.2 OCS: Section KT-2 – Malton Station to Bramalea Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

4.4.10 EMI & EMF

An EMI & EMF Assessment Report (refer to **Appendix J**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-133**.

Throughout this corridor, as with all other corridors under study for the impact assessment, the potential effects and mitigations are identical. This is true regardless of the presence of a layover facility in the territory.

4.4.10.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

4.4.10.1.1 Potential Effects and Mitigation Measures

The potential effects due to operating an electrified transit system for this section are largely the result of overhead catenary wires to power the train, and the operation of 25kV aerial feeder lines to power the catenary. They are summarized as follows:

- EMI;
- Time-Varying EMFs;
- Induced Current in Neighbouring Metallic Wires, Fences, Pipelines, Cables, and Earth (grounding) Networks;
- Unintended Contact with High-Voltage Source; and
- ELF EMF.

The EMI would be the result of high frequency generated by the scraping of the pantograph down the catenary and the motors used to power the train. The EMFs would be the result of current flow down the catenary and within the passenger compartments of the train. The induced current would be the result of current flow down the catenary or the feeder wires. The unintended contact with the high-voltage source would be the result of access to the catenary, live wires inside the passenger compartment, or access to the feeder wires.

Mitigation for each of these potential effects has been implemented as part of the design of the system. In a general sense, for EMI, the power methodology for the Metrolinx system—auto-transformer power—has been selected specifically for its reduction of this type of interference. Additional mitigation methodologies include the following:

- Implementation and use of an EMC Control Plan.
- Proper design, e.g., grounding and shielding as per applicable Canadian electrical standards, physical separation, as identified from bench-marking similar properties across North America.
- During the electrification commissioning phase, overall ELF and RF emissions emanating from the GO electrified railway system as a whole will be field tested and verified to ensure EMFs are within the limits of applicable industry standards.
- Verify ELF EMF by measurements taken before and after project implementation.

4.4.10.2 OCS: Section KT-2 – Malton Station to Bramalea Station

4.4.10.2.1 Potential Effects and Mitigation Measures

Potential effects and mitigation measures associated with EMI & EMF at this location are detailed in Section 4.4.10.1.

4.4.11 Stormwater Management

A Preliminary Stormwater Management Assessment (refer to **Appendix K**) was prepared which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-134**.

4.4.11.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of detailed design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

4.4.11.2 OCS: Section KT-2 – Malton Station to Bramalea Station

With respect to drainage and stormwater management, quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of Detailed Design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

4.4.12 Groundwater and Wells

A Hydrogeological Assessment Study (refer to **Appendix L**) was prepared which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-135**.

4.4.12.1 OCS: Section KT-1 – UP Express Spur (At Highway 427) to Malton Station

4.4.12.1.1 Potential Effects and Mitigation Measures

There are no anticipated footprint impacts of the additional OCS infrastructure in this section therefore no mitigation measures have been proposed.

4.4.12.2 OCS: Section KT-2 – Malton Station to Bramalea Station

4.4.12.2.1 Potential Effects and Mitigation Measures

There are no anticipated footprint impacts of the additional OCS infrastructure in this section therefore no mitigation measures have been proposed.

4.5 Barrie Rail Corridor

4.5.1 Natural Environment

A Natural Environment Impact Assessment Report (refer to **Appendix A**) was prepared, which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-123** and **Table 4-124**.

4.5.1.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.1.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.1.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

4.5.1.3.1 Potential Effects and Mitigation Measures

4.5.1.3.1.1 Terrestrial

4.5.1.3.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report prepared as part of the GO Rail Network Electrification TPAP (Morrison Hershfield, 2017). Impacts to the following communities were identified as part of the 2017 assessment: Commercial and Institutional (CVC), Transportation and Utilities (CVI), Residential, (CVR), Green Land (CGL), Deciduous Woodland (WOD) and Cultural Meadow (CUM) communities. Additional vegetation removal areas within Section BR-3 associated with the additional OCS infrastructure are presented in **Table 4-40** and depicted in **Appendix A, Figure BR-18.**

The Transportation and Utility (CVI) lands that include the existing rail corridor are composed of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due minimal canopy cover. Mitigation for CVI areas include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, vegetation removals within Commercial and Institutional (CVC) lands will be required within the vegetation clearing zone. While vegetation removals are required within these areas, they provide limited habitat for wildlife. Therefore, the removals within these areas are considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CVC communities, the extent of tree removals in these areas is minor.

Details relating to impacted areas within Toronto and Region Conservation Authority (TRCA) Regulated Areas are found in Section 4.5.1.3.1.4.

TABLE 4-40: SUMMARY OF ADDIITONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES BR-3*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Commercial and Institutional (CVC)	0.225	0.002	0.227	Minor
Transportation and Utilities (CVI)	0.033	0.009	0.042	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

Mitigation Measures

- The following mitigation measures, which are common to all ELC communities, will be implemented to minimize/mitigate the potential impacts related to vegetation/tree removals: Vegetation management in accordance with Metrolinx's *Vegetation Guideline* (2020) will include:
    - **Detailed Tree Inventory** – All trees 10 cm or greater in diameter within the study area or with canopies or TPZ extending into the study area. SAR that may be directly impacted by the tree removal shall be identified during the tree inventory to the extent possible using tree inventory methods. This includes identification of tree SAR such as Butternut as well as information on the potential suitable habitat for SAR, such as the presence of bat cavity trees, where visible during the leaf-on period.

- **Tree Protection** – Detailed measures to protect retained adjacent trees. This will include TPZ limits, diagram of tree protection barrier type, tree protection measures, and construction storage and staging areas where information is available. Refer to Section 4.9.1 for detailed tree protection measures during construction.
- **Vegetation Compensation** – Metrolinx has established a vegetation compensation approach for determining and implementing compensation for the removal of trees from the Metrolinx ROW as well as public and private lands. It is a landscape science-based approach designed to reflect the basic principles of the TRCA's ecosystem-based approach in addition to following the requirements of applicable bylaws. Compensation will follow one or a combination of the following approaches: ecological, baseline, or bylaw.
- **For Trees within Metrolinx Property:** All trees within the Metrolinx ROW will be compensated for using either an ecological or baseline approach. Where tree removals are located within a designated natural area, ecological compensation will be implemented. Where removals are outside a designated natural area, a 1:1 ratio approach will be implemented (baseline compensation).
- **For Public/Private Trees:** Compensation for trees within public and private lands, including those on the boundary between the Metrolinx ROW and public or private lands, will follow with the requirements of applicable bylaws. Trees on public or private lands that are not subject to bylaws/regulations will be compensated for following an ecological or baseline approach. Metrolinx will work directly with residents to address the loss of trees on private property.
- **Tree End Use:** Options for the end use of trees removed from Metrolinx property (e.g. reuse/recycling options) will be developed as per the recommendations in the guideline.

- Metrolinx will make efforts to comply with the *Forestry Act* in relation to trees planted on the boundary between two lands (i.e., lands that are Metrolinx owned and lands that are not Metrolinx owned); and
- Compliance with the *Migratory Birds Convention Act* (MBCA).

4.5.1.3.1.2 Aquatic

There are no watercourses within the new track areas, and therefore no aquatic footprint impacts.

4.5.1.3.1.3 Species at Risk

Given the low potential of occurrence of Monarch, Rusty-patched Bumblebee, and Nine-spotted Lady Beetle there are no anticipated footprint impacts to these species or their habitat.

Chimney Swift has a moderate potential of occurrence in the CVC communities; however, since they are found within chimney structures that are part of the CVC, there are no anticipated footprint impacts to the species or its habitat.

4.5.1.3.1.4 Designated Areas

There are no footprint impacts within any Designated Areas, including City of Toronto Ravine and Natural Features Protection By-law areas (RNFP).

4.5.1.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.1.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.1.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

4.5.1.6.1 Potential Effects and Mitigation Measures

4.5.1.6.1.1 Terrestrial

####### 4.5.1.6.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report prepared as part of the 2017 GO Rail Network Electrification EPR . Impacts to the following communities were identified as part of the 2017 assessment: Commercial and Institutional (CVC), Transportation and Utilities (CVI), Residential (CVR), Mixed Forest (FOM), Cultural Meadow (CUM), Marsh (MA), Mixed Swamp (SWM), Deciduous Thicket (THD), Deciduous Woodland (WOD), and Mixed Woodland (WOM) communities.

Additional vegetation removal areas within Section BR-6 associated with the additional OCS infrastructure are presented in **Table 4-41** and depicted in **Appendix A, Figures BR-49** to **BR-50.** The Transportation and Utility (CVI) lands that include the existing rail corridor are comprised of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due minimal canopy cover. Mitigation for CVI areas include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

Details relating to impacted areas within Lake Simcoe Region Conservation Authority (LSRCA) Regulated Areas are found in Section 4.5.1.6.1.4**.**

TABLE 4-41: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES BR-6*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Transportation and Utilities (CVI)	0.002	0	0.002	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

Mitigation Measures

Mitigation measures related to vegetation clearing consist of vegetation management as per the **Metrolinx *Vegetation Guideline*** (2020) and additional measures detailed in Section 4.5.1.3.1.1.1**.**

4.5.1.6.1.2 Aquatic

There are no watercourses within the addition OCS infrastructure areas, and therefore no aquatic footprint impacts.

4.5.1.6.1.3 Species at Risk

Given the low potential of occurrence of Monarch, Rusty-patched Bumblebee, and Nine-spotted Lady Beetle there are no anticipated footprint impacts to these species or their habitat.

4.5.1.6.1.4 Designated Areas

The new track/upgrades are not within Lake Simcoe Region Conservation Authority Regulated areas; therefore, there are no footprint impacts. There are also no footprint impacts to Sheppard's Bush Conservation Area.

Footprint impacts to CVI communities within the Lake Simcoe Protection Plan area are identified in **Table 4-42**. Impacts to these vegetation communities are discussed within Section 4.5.1.6.1.1**.** No removals within the CVI are required outside of the Metrolinx owned ROW.

Metrolinx has established a Vegetation Compensation framework within the ***Vegetation Guideline*** (2020) for Metrolinx undertakings and vegetation that is removed will be compensated for in accordance with the provisions of this framework.

TABLE 4-42: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN DESIGNATED AREAS BR-6*

ELC Community	Lake Simcoe Protection Plan Area			Extent of Tree Removals (based on canopy cover within ELC community)
	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	
Transportation and Utilities (CVI)	0.002	0	0.002	Minor

**areas are approximations for discussion purposes only and not based on surveyed data*

4.5.1.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

4.5.1.7.1 Potential Effects and Mitigation Measures

4.5.1.7.1.1 Terrestrial

4.5.1.7.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report prepared as part of the 2017 GO Rail Network Electrification EPR. Impacts to the following communities were identified as part of the 2017 assessment: Commercial and Institutional (CVC), Transportation and Utilities (CVI), Residential (CVR), Green Land (CGL), Deciduous Woodland (WOD), Cultural Meadow (CUM), Marsh (MA), Shallow Marsh (MAS), Swamp (SW), Agriculture (AG) and Deciduous Forest (FOD) communities. Additional vegetation removal areas within Section BR-7 associated with the additional OCS infrastructure are presented in **Table 4-43** and depicted in **Appendix A, Figures BR-51** to **BR-59.**

The Transportation and Utility (CVI) lands that include the existing rail corridor are comprised of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI are considered minor due minimal canopy cover. Mitigation for CVI areas include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, vegetation removals within several other ELC communities including Residential (CVR), Commercial and Institutional (CVC), Green Lands (CGL) and Cultural Meadow (CUM) will be required within the vegetation clearing zone. While vegetation removals are required within these areas, they provide limited habitat for wildlife. Therefore, the removals within these areas are considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CVC, CGL and CUM communities, the extent of tree removals in these areas is minor. The extent of tree removals in the CVR is considered fair due to the intermediate tree cover. Mitigation for these areas include compliance with the general mitigation measures for vegetation/tree clearing identified below.

Vegetation clearing within the Swamp (SW) community will not impact any specialized amphibian habitat as the areas adjacent to the corridor are not conducive to breeding or hibernation areas. A small amount of tree removal from the edge of these communities is not anticipated to have a significant effect to the ecological features or function associated with the communities including wildlife or wildlife habitat. The

extent of tree removals in the SW areas are extensive due to the high canopy cover. Mitigation for these areas include compliance with the general mitigation measures for vegetation/tree clearing identified below. In addition, physical separation (use of silt fencing) between the limit of the vegetation removal zone and the SW areas should occur to buffer the adjacent wetlands.

Details relating to impacted areas within LSRCA Regulated Areas are in Section 4.5.1.6.1.4.

TABLE 4-43: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES BR-7*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Commercial and Institutional (CVC)	0.011	0.004	0.015	Minor
Transportation and Utilities (CVI)	0.0005	0.0003	0.0008	Minor
Residential (CVR)	0.014	0.003	0.017	Fair
Green Land (CGL)	0.0002	0	0.0002	Minor
Cultural Meadow (CUM)	0.0002	0	0.0002	Minor
Swamp (SW)	0.0004	0	0.0004	Extensive

**areas are approximate for discussion purposes only and not based on surveyed data*

Mitigation Measures

Mitigation measures related to vegetation clearing consist of vegetation management as per the Metrolinx's *Vegetation Guideline* (2020) and additional measures detailed in Section 4.5.1.3.1.1.1.

4.5.1.7.1.2 Aquatic

There are five watercourse crossings within the corridor section, including the Holland River East Branch and the following tributaries: Tannery Creek, Clubinis Creek, Wesley Creek and Western Creek. No adverse effects to these watercourses are anticipated to result from the installation of OCS structures as they are located away from the watercourses. To mitigate the potential indirect impacts to the watercourses, sediment and erosion control measures will be implemented and required precautions will be taken to prevent spills and the release of hazardous materials.

4.5.1.7.1.3 Species at Risk

Given the low potential of occurrence of Monarch, Rusty-patched Bumblebee, Nine-spotted Lady Beetle, Eastern Ribbonsnake, Bobolink, and Eastern Meadowlark, there are no anticipated footprint impacts to these species or their habitat.

Butternuts have a low potential for occurrence within the CGL, CVC and CVR communities. The presence/absence of Butternuts will be confirmed during Detailed Design. Should any Butternuts be identified, a health assessment will be required for any pure Butternuts. Dependent on the number and condition of individuals found, approval under the ESA, 2007 may include a registration and/or permitting process. Protective measures for any Butternuts within 50 metres of the construction footprint that do not need to be removed should be implemented.

Avian field investigations were conducted at bridge structures identified to provide suitable nesting habitat for Barn Swallows during the 2017 TPAP. The Clubinis Creek Bridge (Newmarket Sub Mile 32.0) and East Holland River Bridge (Newmarket Sub Mile 33.70) were surveyed for active nests and individuals. No Barn Swallow nests or individuals were found at these sites; therefore, there are no anticipated impacts. Barn Swallow nesting was identified in the East Holland River culvert within the

Barrie Rail Corridor Expansion Project Natural Environment Report (Hatch, 2017). There are no impacts to this culvert anticipated and therefore no impacts to Barn Swallow. While the Red-headed Woodpecker has a moderate potential of occurrence in the CGL communities, this species is generally tolerant of disturbance and individual tree removals within the CGL are not anticipated to have an impact on this species.

Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-coloured Bat have a low potential to occur in the SW communities. Further studies during Detailed Design may be required (in consultation with the MECP) to determine potential impacts to bat species. However, the level of tolerance of these species to the disturbance caused by the Project is anticipated to be high as only minor impacts to woodland edges have been identified.

4.5.1.7.1.4 Designated Areas

Footprint impacts to CVI, CVC, CVR, CGL, CUM, and SW lands within Lake Simcoe Region Conservation Authority Regulated Areas are identified in **Table 4-44**. Impacts to these vegetation communities have been discussed within **Section 4.5.1.7.1.1.** No vegetation clearing within the CUM, CVR, CGL, CUM or SW communities will occur outside of the existing Metrolinx owned ROW and only minor removals within the CVI and CVC communities are required outside of the ROW.

There are no footprint impacts to Mabel Davis Conservation Area, Wesley Brooks Conservation Area or Aurora McKenzie Marsh Wetland PSW.

Footprint impacts will also occur within CVC, CVI, CVR, SW, CUM, and CGL communities within the Lake Simcoe Protection Plan area. Impacts to these vegetation communities have been discussed within **Section 4.5.1.7.1.1.** No vegetation clearing within the CGL, CUM or SW communities will occur outside of the existing Metrolinx owned ROW and only minor removals within the CVI, CVR, and CVC communities are required outside of the ROW.

Metrolinx has established a Vegetation Compensation framework within the Vegetation Guideline for Metrolinx undertakings and vegetation that is removed will be compensated to comply with the provisions of this framework.

TABLE 4-44: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN DESIGNATED AREAS BR-7*

ELC Community	LSRCA Regulation Limit			Lake Simcoe Protection Plan Area			Extent of Tree Removals (based on canopy cover within ELC community)
	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	
Commercial and Institutional (CVC)	0.011	0.004	0.015	0.011	0.004	0.015	Minor
Transportation and Utilities (CVI)	0.0005	0.0003	0.0008	0.0005	0.0003	0.0008	Minor
Residential (CVR)	0.005	0	0.005	0.014	0.003	0.017	Fair
Green Land (CGL)	0.0001	0	0.0001	0.0002	0	0.0002	Minor
Cultural Meadow (CUM)	0.0002	0	0.0002	0.0002	0	0.0002	Minor
Swamp (SW)	0.0004	0	0.0004	0.0004	0	0.0004	Extensive

**areas are approximate for discussion purposes only and not based on surveyed data*

4.5.1.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.1.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.1.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.1.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.1.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

4.5.1.12.1 Potential Effects and Mitigation Measures

4.5.1.12.1.1 Terrestrial

4.5.1.12.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report prepared as part of the 2017 GO Rail Network Electrification EPR. Impacts to the following communities were identified as part of the 2017 assessment: Commercial and Institutional (CVC), Transportation and Utilities (CVI), Residential (CVR), Green Land (CGL), Deciduous Woodland (WOD), Cultural Meadow (CUM), Mixed Forest (FOM), and Treed Agriculture (TAG) communities. Additional vegetation removal areas within Segment BR-12 associated with the additional OCS infrastructure are presented in **Table 4-45** and depicted in **Appendix A, Figures BR-102** to **BR-104.**

The Transportation and Utility (CVI) lands that include the existing rail corridor are comprised of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due minimal canopy cover. Mitigation for CVI areas include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, vegetation removals within several other ELC communities including Residential (CVR), Commercial and Institutional (CVC), and Treed Agriculture (TAG) will be required within the vegetation clearing zone. While vegetation removals are required within these areas, they provide limited habitat for wildlife. Therefore, the removals within these areas are considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CVC, CUM, and TAG communities, the extent of tree removals in these areas is minor. The extent of tree removals in the CVR is considered fair due to the intermediate tree cover. Mitigation for these areas include compliance with the general mitigation measures for vegetation/tree clearing identified below.

Deciduous Woodland (WOD) communities, which are isolated and located primarily adjacent to the rail corridor, or surrounded by CVR, provide only non-specialized habitat for wildlife which result in low potential ecological impacts. Vegetation clearing within the WOD communities will result in a loss of vegetation along the edge of these natural vegetation communities. However, a small amount of woodland edge removal is not anticipated to have an significant effects to the ecological features or function associated with WOD communities including wildlife or wildlife habitat. The high amount of canopy cover in the WOD communities will result in extensive tree removals within these communities. Mitigation for these areas include compliance with the general mitigation measures for vegetation/tree clearing identified below.

Vegetation removals within CVC and CVI communities are required within some areas associated with the additional OCS infrastructure that extend beyond the limit of Section BR-12 into the Barrie-Collingwood Rail Corridor. For the purposes of this report, the impacts to these CVC and CVI area have been included in the calculations in **Table 4-45**.

Details relating to impacted areas within LSRCA Regulated Areas are in Section 4.5.1.12.1.4.

TABLE 4-45: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES BR-12*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Commercial and Institutional (CVC)	0.338	0.285	0.623	Minor
Transportation and Utilities (CVI)	0.051	0.013	0.064	Minor
Residential (CVR)	0.006	0	0.006	Fair
Deciduous Woodland (WOD)	0.116	0	0.166	Extensive
Treed Agriculture (TAG)	0.149	0.017	0.166	Extensive

**areas are approximate for discussion purposes only and not based on surveyed data*

Mitigation Measures

Mitigation measures related to vegetation clearing consist of vegetation management as per the Metrolinx's *Vegetation Guideline* (2020) and additional measures detailed in Section 4.5.1.3.1.1.1.

4.5.1.12.1.2 Aquatic

There is one watercourse within the additional OCS infrastructure area: Whiskey Creek. Whiskey Creek is conveyed under the corridor by a culvert; therefore, no footprint impacts to the culvert or watercourse are anticipated to result from the installation of OCS within the existing corridor above the culvert. To mitigate the potential indirect impacts to the watercourse, sediment and erosion controls will be implemented and required precautions will be taken to prevent spills and the release of hazardous materials, and debris protection will be installed on bridges undergoing modifications.

4.5.1.12.1.3 Species at Risk

Given the low potential of occurrence of Monarch and Nine-spotted Lady Beetle, there are no anticipated footprint impacts to these species or their habitat.

Butternuts have a low potential for occurrence within the CVR and CVC communities and moderate potential within the WOD and TAG. The presence/absence of Butternuts will be confirmed during detailed design. Should any Butternuts be identified, a health assessment will be required for any pure Butternuts. Dependent on the number and condition of individuals found, approval under the ESA, 2007 may include a registration and/or permitting process. Protective measures for any Butternuts within 50 metres of the construction footprint that do not need to be removed should be implemented.

While the Red-headed Woodpecker has a moderate potential of occurrence in the WOD and TAG communities, this species is generally tolerant of disturbance and small amount of woodland edge removal within the WOD, and individual tree removals in the TAG are not anticipated to have an impact on this species. The potential loss of habitat for Red-headed Woodpecker associated with tree removals is considered minor in relation to the amount of adjacent un-impacted habitat.

Little Brown Myotis and Northern Myotis have a moderate potential to occur within the FOM and WOD communities. Further studies during detailed design may be required (in consultation with the MECP) to determine potential impacts to bat species. However, the level of tolerance of these species to the disturbance caused by the Project is anticipated to be high as only minor impacts to woodland edges were identified.

4.5.1.12.1.4 Designated Areas

There are no footprint impacts within LSRCA Regulated Areas within the WOD or CVR communities. Footprint impacts to CVI, CVC, and TAG lands within Lake Simcoe Region Conservation Authority

Regulated Areas are identified in **Table 4-46.** Impacts to these vegetation communities are discussed within Section 4.5.1.12.1.1. No vegetation clearing within the LSRCA Regulated Area within the TAG communities will occur outside of the existing Metrolinx owned ROW and only minor removals within the CVI and CVC communities are required outside of the ROW.

Footprint impacts will also occur within CVI, CVC, CVR, WOD, and TAG communities within the Lake Simcoe Protection Plan area. Impacts to these vegetation communities have been discussed within Section 4.5.1.12.1.1. No vegetation clearing within the WOD or CVR communities will occur outside of the existing Metrolinx owned ROW and only minor removals within the CVI, CVC and TAG communities are required outside of the ROW.

Metrolinx has established a Vegetation Compensation framework within the ***Vegetation Guideline*** (2020) for Metrolinx undertakings and vegetation that is removed will be compensated for to comply with the provisions of this framework.

TABLE 4-46: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN DESIGNATED AREAS BR-12*

ELC Community	LSRCA Regulation Limit			Lake Simcoe Protection Plan Area			Extent of Tree Removals (based on canopy cover within ELC community)
	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	
Commercial and Institutional (CVC)	0.089	0.100	0.189	0.338	0.284	0.622	Minor
Transportation and Utilities (CVI)	0.010	0.004	0.014	0.051	0.013	0.064	Minor
Residential (CVR)	0	0	0	0.006	0	0.006	Minor
Deciduous Woodland (WOD)	0	0	0	0.166	0	0.166	Minor
Treed Agriculture (TAG)	0.027	0	0.027	0.149	0.017	0.166	Extensive

**Areas are approximate for discussion purposes only and not based on surveyed data*

4.5.2 Preliminary Environmental Site Assessment

A Preliminary Environmental Site Assessment (refer to **Appendix B**) was prepared for new layover facilities. A summary of mitigation and monitoring commitments for this section is included in **Table 4-125**.

4.5.2.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.2.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.2.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

4.5.2.3.1 Potential Effects and Mitigation Measures

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

4.5.2.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.2.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.2.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

4.5.2.6.1 Potential Effects and Mitigation Measures

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

4.5.2.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

4.5.2.7.1 Potential Effects and Mitigation Measures

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

4.5.2.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.2.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.2.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.2.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.2.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

4.5.2.12.1 Potential Effects and Mitigation Measures

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

4.5.3 Built Heritage Resources and Cultural Heritage Landscapes

Please refer to **Appendix C1** for a description of methodology followed for assessment of Cultural Heritage impacts. Additional details can be found in the Cultural Heritage Technical Memo contained in **Appendix C1**. A summary of mitigation and monitoring commitments for this section is included in **Table 4-126**.

Thirteen (13) known or potential BHRs and CHLs were identified in this corridor; only one (1) has the potential to be indirectly impacted as a result of the additional electrification infrastructure.

4.5.3.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.3.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.3.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

4.5.3.3.1 Potential Effects and Mitigation Measures

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.5.3.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.3.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.3.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

4.5.3.6.1 Potential Effects and Mitigation Measures

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.5.3.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

4.5.3.7.1 Potential Effects and Mitigation Measures

Ten BHRs (BR-05, BR-06, BR-07, BR-08, BR-09, BR-12, BR-13, BR-14, BR-15, BR-16) were identified in this section. No direct impacts to the heritage attributes associated with these BHRs are anticipated as a result of the additional OCS infrastructure. Indirect impacts to all but BR-12 are possible due to construction activities associated with OCS infrastructure and which may result in limited and temporary adverse vibration impacts.

Feature mapping of resources is provided in **Appendix C1**. A summary of mitigation and monitoring commitments is included in **Table 4-126**.

4.5.3.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.3.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.3.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.3.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.3.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

4.5.3.12.1 Potential Effects and Mitigation Measures

Three BHRs (BR-18, BR-23, BR-24) were identified in this section. BR-18 was identified as having the potential to be indirectly impacted by the additional OCS infrastructure. It is noted that the new OCS Impact/Vegetation Clearance Zone is less than 5 metres from the structure on this property. It is understood that all OCS footprint impacts are anticipated to be contained within the existing right-of-way. As such, no direct impacts to this property are anticipated and no further work is required from an electrification perspective.

Feature mapping of resources is provided in **Appendix C1**. A summary of mitigation and monitoring commitments is included in **Table 4-126**.

4.5.4 Archaeology

A Stage 1 Archaeological Assessment Report (refer to **Appendix D**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-127**.

4.5.4.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.4.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.4.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

4.5.4.3.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed there are no anticipated impacts of the proposed OCS infrastructure in this section; therefore, no mitigation measures have been proposed.

4.5.4.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.4.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.4.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

4.5.4.6.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2, the area does not retain archaeological potential. No further archaeological assessment is required.

No mitigation measures are required.

4.5.4.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

4.5.4.7.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2, the area does not retain archaeological potential. No further archaeological assessment is required.

No mitigation measures are required.

4.5.4.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.4.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.4.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.4.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.4.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

4.5.4.12.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed the potential for the disturbance of unassessed or documented deeply buried archaeological resources within the Allandale Site (BcGw-69). Being a monitoring zone, previous archaeological assessments of the Allandale site have been of limited scope and have not fully characterized the nature and extent of the archaeological deposits. Accordingly, depending on the results of the Stage 2 assessment, there is a possibility that further Stage 3 archaeological assessment (with the engagement of interested Indigenous Nations & organizations) and, ultimately, Stage 4 mitigation—protection/ avoidance of the Allandale site - will be recommended.

As with all such significant archaeological sites, it is preferable that impacts to the site are mitigated through the development of a Stage 4 protection and avoidance strategy. If the site cannot be fully protected and avoided, then some archaeological mitigation through salvage excavation, with Indigenous engagement, may also be required. Finally, due to the previously documented evidence of disturbed human remains on the historic Allandale Station site, archaeological monitoring of proposed impacts to the historic station property is recommended within the area between Essa Road and Milburn Street.

For areas determined to have archaeological potential or contain archaeological resources that will be impacted by Project activities, a Stage 2 Archaeological Assessment conducted by test pit survey at five (5) metre intervals will be conducted by a professionally licensed archaeologist prior to disturbance.

Based on the results of the Stage 2 studies, Stage 3 and/or 4 Archaeological Assessments will also be carried out as required during detailed design. Refer to **Appendix D** for detailed mapping of archaeological potential at this location.

4.5.5 Land Use and Socio-Economic

A Land Use and Socio-Economic Assessment Report (refer to **Appendix E**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-128**.

4.5.5.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.5.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.5.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

4.5.5.3.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area will be located within the rail ROW in this section, though there are some areas where engineering solutions will be required to keep OCS structures within the ROW. The proposed design solutions and where they will occur will be finalized in the Detailed Design phase of the Project. There are no expected footprint effects as a result of this activity.

Mitigation Measures

No mitigation measures are required.

4.5.5.3.2 Socio-Economic – Potential Effects and Mitigation Measures

There are no sensitive facilities or recreational amenities located adjacent to the additional OCS infrastructure area, and therefore there are no effects anticipated.

There are no recreational amenities within proximity of the additional OCS infrastructure area.

Other potential effects on the socio-economic environment associated with the BR-3 were assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.5.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.5.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*
- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.5.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.5.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

Ensure that the mitigation recommendations outlined in the respective reports listed above pertaining to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF are adhered to and implemented during Detailed Design and construction.

4.5.5.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.5.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.5.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

4.5.5.6.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area required in this section is located in the Town of Aurora at the Aurora GO Station. Additional property requirements have been identified as part of the NT&F TPAP in order to accommodate proposed project infrastructure. The area immediately surrounding the station is *Mixed Use and Low-Density Residential* land uses. The Mixed Uses around the GO station are a part of the Wellington Street Promenade Special Design Area. The OCS infrastructure will not impede development of this area. The Sheppard's Bush conservation area is to the east of the station. Given the site's existing use as a GO station, this facility is consistent with existing and adjacent uses.

Mitigation Measures

The additional OCS infrastructure area is located in an area of compatible land use with the existing land use and zoning of the property. A range of municipal permits and approvals may be required, and if so, Metrolinx will obtain all required permits and approvals. However, further coordination with the Town of Aurora will be undertaken during future project phases to finalize design details and minimize any conflicts on adjacent uses. Metrolinx is currently in discussions with the landowners regarding the use of this property and will reach an agreement prior to the commencement of construction activities.

4.5.5.6.2 Socio-Economic – Potential Effects and Mitigation Measures

There are no sensitive facilities adjacent to the additional OCS infrastructure area, and therefore there are no effects anticipated.

Sheppard's Bush, a 26 hectare conservation area, is adjacent to the rail corridor south of Wellington Street East. The Town of Aurora has a detailed trails plan which includes existing and proposed trails, and trails crossings.

There are no anticipated adverse effects on these recreational amenities due to the implementation of electrification infrastructure identified as part of the conceptual design developed for the Significant Addendum to the Electrification TPAP. Notwithstanding this, potential conflicts with recreational amenities will be evaluated during the Detailed Design phase, and if required, the Town of Aurora will be consulted to determine appropriate design solutions to mitigate/minimize any effects to recreational amenities.

Other potential effects on the socio-economic environment associated with the BR-6 were assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.5.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.5.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*

- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.5.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.5.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

Ensure that the mitigation recommendations outlined in the respective reports listed above pertaining to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF are adhered to and implemented during Detailed Design and construction.

4.5.5.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

4.5.5.7.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area will be located within the rail ROW in this section, though there are some areas where engineering solutions will be required to keep OCS structures within the ROW. The proposed design solutions and where they will occur will be finalized in the Detailed Design phase of the Project. There are no expected footprint effects as a result of this activity.

Mitigation Measures

No mitigation measures are required.

4.5.5.7.2 Socio-Economic – Potential Effects and Mitigation Measures

There are a number of sensitive facilities along this rail corridor as outlined in **Table 4-47**. The Aurora Early Learning Centre (child care centre) is located within 25 metres of the rail corridor. The Aurora Montessori School (school) is located within 30 metres of the rail corridor. The Newmarket Community Centre and Lions Hall (community landmark) is located within 30 metres of the rail corridor. The Newmarket Recreation Youth Centre & Sk8 Park is located more than 30 metres away from the rail corridor, while the Church on the Go is located directly adjacent to the rail corridor.

However, considering the proposed additional OCS infrastructure is anticipated to be contained within the existing rail right-of-way, there is no anticipated footprint impact to this sensitive facility.

TABLE 4-47: SENSITIVE FACILITIES WITHIN THE VICINITY OF BR-7

Corridor Segment	Type	Name	Address	Distance from 5 m OCS Impact Zone
BR-7	Community Landmark	Church on the GO	465 Davis Drive	0 m
BR-7	Child Care Centre	Aurora Early Learning Centre	138 Centre Street	25 m
BR-7	School	Aurora Montessori School	330 Industrial Parkway North	30 m
BR-7	Community Landmark	Newmarket Community Centre and Lions Hall	200 Doug Duncan Drive	30 m
BR-7	Community Landmark	Newmarket Recreation Youth Centre & Sk8 Park	56 Charles Street	40 m
BR-7	School	École élémentaire catholique Saint-Jean	90 Walton Drive	120 m

A cycling route and pedestrian trail traverses the rail corridor at Wellington Street East and Centre Street rail crossings. The Audrie Sanderson Park and three multi-use trails are in the vicinity of the rail corridor: the Tom Taylor and *Nokiidaa Trail* cross the rail corridor at St. John's Sideroad East, and the *Nokiidaa Trail* parallels the rail corridor for most of its route between Timothy Street and the East Gwillimbury GO Station, with several crossover points. As well, the Foxtail Ride, Bailey Ecological Park and Fairy Lake Park and associated trails and cycling routes are located to the west and along the rail corridor. A cycling route and pedestrian trail traverse the rail corridor at Timothy Street rail crossing and throughout surrounding parks, such as Fairy Lake and All Our Kids Playpark. The Town of Newmarket has a planned cycling route along Water Street, which also traverses the rail corridor just south of Timothy Street. Another cycling route traverses the rail corridor at Davis Drive rail crossing and throughout surrounding parks/conservation areas. The town of Newmarket has planned a cycling route along Queen Street, which traverses the rail corridor just south of Davis Drive. The Oak Ridges Moraine Trail crosses the rail corridor on Wellington St., just north of the Aurora GO Station. The Town of Aurora has a detailed trails plan which includes existing and proposed trails, and trails crossings.

There are no anticipated adverse effects on these recreational amenities due to the implementation of electrification infrastructure identified as part of the conceptual design developed for the Significant Addendum to the Electrification TPAP. Notwithstanding this, potential conflicts with recreational amenities will be reviewed in further detail during the Detailed Design phase, and if required the Town of Aurora, Town of Newmarket will be consulted to determine appropriate design solutions to mitigate/minimize any effects to recreational amenities. .

Other potential effects on the socio-economic environment associated with the BR-7 have been assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.5.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.5.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*
- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.5.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.5.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

Ensure that the mitigation recommendations outlined in the respective reports listed above pertaining to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF are adhered to and implemented during Detailed Design and construction.

4.5.5.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.5.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.5.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.5.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.5.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

4.5.5.12.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area required in this section is located in the City of Barrie, east of the Allandale Waterfront GO Station. Additional property requirements have been identified as part of the NT&F TPAP in order to accommodate proposed project infrastructure. The area surrounding the station and the area required for the additional OCS infrastructure area is *Mixed Use, Commercial and Low-Density Residential* land uses. The Allandale Station Park is to the south-east of the station with Lakeshore Drive separating the park from the railway right-of-way.

Mitigation Measures

The additional OCS infrastructure area is located in an area of compatible land use with the existing land use and zoning of the property. A range of municipal permits and approvals may be required, and if so, Metrolinx will obtain all required permits and approvals. However, further coordination with the City of Barrie will be undertaken during Detailed Design to finalize design details and minimize any conflicts on adjacent uses. Metrolinx is currently in discussions with the landowners regarding the use of this property and will reach an agreement prior to the commencement of construction activities.

4.5.5.12.2 Socio-Economic – Potential Effects and Mitigation Measures

There are two sensitive facilities (community and care centre) within the vicinity of the additional OCS required in the BR-12 corridor, as seen in **Table 4-48**. The closest of these facilities is 70 m from the OCS impact zone both are on the far side of the track from the OCS impact zone. There will be no footprint effects to the sensitive facility.

TABLE 4-48: SENSITIVE FACILITIES WITHIN THE VICINITY OF THE BR-12 CORRIDOR

Corridor Segment	Type	Name	Address	Distance from 5 m OCS Impact Zone
BR-12	Care Centre	Mill Creek Care Center	286 Hurst Drive, Barrie	70 m
BR-12	Community Centre	Southshore Community Centre	205 Lakeshore Drive, Barrie	130 m

Three large parks border this section of the rail corridor: Lovers Creek Ravine, Allandale GO Station Park and South Shore Park. In addition, a portion of the Trans Canada Trail crosses the rail corridor on Minets Point Road.

There are no anticipated adverse effects on these recreational amenities due to the implementation of electrification infrastructure identified as part of the conceptual design developed for the Significant Addendum to the Electrification TPAP. Notwithstanding this, potential conflicts with recreational amenities will be reviewed in further detail during the Detailed Design phase, and if required the City of Barrie will be consulted to determine appropriate design solutions to mitigate/minimize any effects to recreational amenities.

Other potential effects on the socio-economic environment associated with the BR-12 have been assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.5.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.5.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*
- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.5.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.5.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

Ensure that the mitigation recommendations outlined in the respective reports listed above pertaining to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF are adhered to and implemented during Detailed Design and construction.

4.5.6 Air Quality

A Regional Air Quality Study Report (refer to **Appendix F1**) details the impact assessment completed for this discipline, which is described in Section 4.8.7.2. A summary of mitigation and monitoring commitments for this section is included **Table 4-129**.

4.5.7 Noise and Vibration

The assessment of potential noise and vibration effects within this corridor is detailed in **Appendix G4**. **Appendix O4** provides maps showing the locations of receptors and recommended noise and vibration mitigation. A summary of mitigation and monitoring commitments for this section is included in **Table 4-130**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.4.

4.5.7.1 Operational Noise Assessment

The predicted Adjusted Noise Impacts for the project are summarized in **Table 4-49** and **Table 4-50**, and the locations of the "segments" are presented in **Figure 3-15**.

Impact ratings for the evaluated 124 representative receptors for the rail operations listed in the table can be summarised as follows:

- 32 daytime Adjusted Noise Impacts were classified as very significant (i.e., greater than 10 dB);
- 54 daytime Adjusted Noise Impacts were classified as significant (i.e., between 5 and 9.99 dB);
- 9 daytime Adjusted Noise Impacts were classified as noticeable (i.e., between 3 and 4.99 dB);
- 29 daytime Adjusted Noise Impacts were classified as insignificant (i.e., less than 2.99 dB);
- 32 nighttime Adjusted Noise Impacts were classified as very significant (i.e., greater than 10 dB);
- 66 nighttime Adjusted Noise Impacts were classified as significant (i.e., between 5 and 9.99 dB);
- 6 nighttime Adjusted Noise Impacts were classified as noticeable (i.e., between 3 and 4.99 dB); and
- 20 nighttime Adjusted Noise Impacts were classified as insignificant (i.e., less than 2.99 dB).

Mitigation measures were investigated for all receptors where the Adjusted Noise Impacts were predicted to be significant or very significant.

TABLE 4-49: SUMMARY OF ADJUSTED NOISE IMPACTS - PARKDALE JUNCTION TO KING CITY GO

Segment	Adjusted Impact Rating[1]	Average Objective (dB)[2]		Average Adjusted Noise Impact (dB)		Investigate Mitigation? [4]
		Daytime[3]	Nighttime[3]	Daytime[3]	Nighttime[3]	
Parkdale Junction to Bloor-Lansdowne GO	Very Significant	-	-	-	-	No
	Significant	-	-	-	-	
	Noticeable	55.0	-	4.3	-	
	Insignificant	55.0	50.0	-0.5	-0.1	
Bloor-Lansdowne GO to Caledonia GO	Very Significant	-	53.2	-	10.5	Yes[5]
	Significant	57.6	51.2	6.1	8.7	
	Noticeable	55.0	-	4.8	-	
	Insignificant	51.7	58.7	-0.8	-6.3	
Caledonia GO to Downsview Park GO	Very Significant	-	52.6	-	10.2	Yes[5]
	Significant	56.9	50.2	6.4	6.6	
	Noticeable	55.0	-	3.0	-	
	Insignificant	48.2	50.0	-2.8	-2.0	
Downsview Park GO to Rutherford GO	Very Significant	-	-	-	-	Yes[5]
	Significant	55.0	50.0	7.3	9.1	
	Noticeable	-	50.0	-	3.8	
	Insignificant	55.7	55.9	-0.4	-1.0	
Rutherford GO to Maple GO	Very Significant	-	-	-	-	Yes[5]
	Significant	-	50.0	-	7.4	

	Noticeable	-	-	-	-	
	Insignificant	55.0	50.4	-3.8	-2.4	
Maple GO to Kirby GO	Very Significant	-	-	-	-	Yes[5]
	Significant	27.5	50.0	4.0	7.7	
	Noticeable	55.0	-	3.6	-	
	Insignificant	-	-	-	-	
Kirby GO to King City GO	Very Significant	58.3	54.4	13.9	14.7	Yes[5]
	Significant	55.7	53.0	6.9	8.1	
	Noticeable	-	-	-	-	
	Insignificant	-	-	-	-	

Notes: [1] Ratings are quantified as: Insignificant – Less than 3 dB, Noticeable – 3 dB to 4.99 dB, Significant – 5 to 9.99 dB
[2] The objective is the higher of either the Pre-project sound level or the 55 / 50 dBA default day/night sound levels.
[3] Daytime is a 16-hour period (i.e., from 0700h to 2300h) and Nighttime is an 8-hour period (i.e., from 2300h to 0700h).
[4] The potential to mitigate is considered when a significant (or greater) impact is predicted. This is equivalent to an increase of 5 dB or greater, relative to the objective level, as per the MOEE/GO Protocol. An adjusted noise impact greater than 5 dB requires the investigation of mitigation.
[5] Segment contains existing noise barriers for which retrofit was not considered.

TABLE 4-50: SUMMARY OF ADJUSTED NOISE IMPACTS - KING CITY GO TO ALLANDALE GO

Segment	Adjusted Impact Rating	Average Objective (dB)[2]		Average Adjusted Noise Impact (dB) [1]		Investigate Mitigation? [4]
		Daytime[3]	Nighttime[3]	Daytime[3]	Nighttime[3]	
King City GO to Aurora GO	Very Significant	60.1	55.9	11.1	14.5	Yes[5]
	Significant	55.0	52.7	6.8	7.9	
	Noticeable	55.0	25.5	3.9	2.2	
	Insignificant	55.0	50.0	-1.2	1.2	
Aurora GO to Newmarket GO	Very Significant	58.2	43.2	11.0	12.5	Yes[5]
	Significant	55.3	52.4	6.8	8.0	
	Noticeable	55.0	-	4.9	-	
	Insignificant	59.3	55.9	-0.4	-1.4	
Newmarket GO to East Gwillimbury GO	Very Significant	59.9	54.2	12.0	12.9	Yes
	Significant	55.0	52.6	8.7	8.6	
	Noticeable	55.0	-	4.2	-	
	Insignificant	-	-	-	-	
East Gwillimbury GO to Bradford GO	Very Significant	62.2	58.3	10.6	13.7	Yes
	Significant	63.8	56.8	8.9	8.4	
	Noticeable	55.0	-	4.3	-	
	Insignificant	-	-	-	-	
Bradford GO to Innisfil GO	Very Significant	-	52.3	-	11.2	Yes
	Significant	59.2	54.4	6.5	7.2	
	Noticeable	-	57.2	-	4.8	
	Insignificant	55.0	-	2.8	-	
	Very Significant	-	51.5	-	14.0	Yes

Innisfil GO to Barrie South GO	Significant	64.1	57.8	6.1	8.2	
	Noticeable	-	63.1	-	4.6	
	Insignificant	55.0	52.1	-0.7	-0.9	
Barrie South GO to Allandale GO	Very Significant	-	-	-	-	No
	Significant	-	-	-	-	
	Noticeable	-	59.7	-	4.1	
	Insignificant	56.2	51.3	-10.7	-10.2	

Notes: [1] Ratings are quantified as: Insignificant – Less than 3 dB, Noticeable – 3 dB to 4.99 dB, Significant – 5 to 9.99 dB
[2] The objective is the higher of either the Pre-project sound level or the 55 / 50 dBA default day/night sound levels.
[3] Daytime is a 16-hour period (i.e., from 0700h to 2300h) and Nighttime is an 8-hour period (i.e., from 2300h to 0700h).
[4] The potential to mitigate is considered when a significant (or greater) impact is predicted. This is equivalent to an increase of 5 dB or greater, relative to the objective level, as per the MOEE/GO Protocol. An adjusted noise impact greater than 5 dB requires the investigation of mitigation.
[5] Segment contains existing noise barriers for which retrofit was not considered.

The predicted sound levels from the electric traction power facilities, were evaluated at nearby receptors and are summarized in **Table 4-51**. The predicted sound levels from the Newmarket SWS, Gilford PS and Allandale TPS at nearby receptors were above the applicable sound level limits for nighttime. The TPF facilities study were based on assumptions regarding site configuration and equipment and therefore the resulting recommendations are broad. As such, a detailed acoustical design review is recommended at the detailed design to ensure that appropriate noise control measures to meet the NPC-300 limits have been incorporated into the final design. An updated evaluation should include more accurate sound levels and placement for transformers and, if necessary, mitigation measures such as low noise fans or barriers should be investigated for the three TPFs during this stage of the design. The NPC-300 sound level limits will be met with these measures.

The predicted sound levels from the Maple PS at nearby receptors were below the applicable limits for the; therefore, no mitigation measures are required for that facility.

TABLE 4-51: PREDICTED SOUND LEVELS FROM ELECTRIC TRACTION POWER FACILITIES

Electric Traction Power Facility	Receptor ID	Evaluation Location	Period [1]	Predicted Sound Levels	Applicable Limit	Compliance with Applicable Limit
				(dBA)	(dBA)	(Yes/No)
Maple PS	R033	Plane of Window	Daytime\Evening	29	50	Yes
			Nighttime	29	45	Yes
		Outdoor Area	Daytime\Evening	27	50	Yes
Newmarket SWS	R065	Plane of Window	Daytime\Evening	46	50	Yes
			Nighttime	46	45	No
		Outdoor Area	Daytime\Evening	41	50	Yes
Gilford PS	R100	Plane of Window	Daytime\Evening	47	50	Yes
			Nighttime	47	45	No
		Outdoor Area	Daytime\Evening	44	50	Yes
Allandale TPS	R122	Plane of Window	Daytime\Evening	46	50	Yes
			Nighttime	46	45	No
		Outdoor Area	Daytime\Evening	45	50	Yes

Notes: [1] Daytime occurs from 0700-1900h. Evening occurs from 1900h-2300h. Nighttime occurs from 2300h to 0700h

The predicted sound levels from the Post-project layover sites were evaluated at nearby receptors and are summarised in **Table 4-52**. The predicted sound levels for the Post-project scenario at the Allandale Layover were over the applicable limit of 55 dBA. Therefore, mitigation measures were investigated for this facility.

TABLE 4-52: PREDICTED SOUND LEVELS FROM POST-PROJECT LAYOVER SITES

Layover	Receptor ID	Evaluation Location	Period	Predicted 1-hr L_{EQ} Sound Levels	Applicable Limit	Compliance with Applicable Limit
				(dBA)	(dBA)	(Yes/No)
Bradford Passing Loop	R093	Outdoor Area	Daytime\Evening	49	55	Yes
		Plane of Window	Daytime\Evening \Nighttime	51	55	Yes
Bradford Layover	R094	Outdoor Area	Daytime\Evening	44	55	Yes
		Plane of Window	Daytime\Evening \Nighttime	47	55	Yes
Allandale Layover	R123	Outdoor Area	Daytime\Evening	61	55	No
		Plane of Window	Daytime\Evening \Nighttime	63	55	No

Along the Barrie Corridor, the investigation of mitigation was triggered along most of the study area. In total, 133 barriers were assessed for feasibility. A summary of all the barriers investigated and the results of the technical feasibility, constructability and economic feasibility studies can be found in **Table 4-53** to **Table 4-56**. The noise barrier must achieve a minimum reduction of 5 dB to be considered technically feasible (from an acoustics perspective). To achieve a 5 dB reduction at receptors, a 5 m preliminary noise barrier was modelled at the ROW between the rail and receptors. If the 5 dB reduction was not achieved a 6 m then 7 m barrier was considered.

TABLE 4-53: SUMMARY OF BARRIER FEASIBILITY (BARRIERS 10 TO 54 OF 133)

Barrier	Figure [78]	Technical Feasibility (≥5 dB Reduction)[1]	Constructability	Economic Feasibility	Overall Feasibility
Barrier 010	G.1.2	YES	NO[2]	N/A	NO
Barrier 011	G.1.2	YES	NO[2]	N/A	NO
Barrier 017	G.1.6	YES	YES	NO	NO
Barrier 018	G.1.6	YES			
Barrier 019	G.1.7	NO	N/A	N/A	NO
Barrier 024	G.1.7	YES	YES	NO	NO
Barrier 025	G.1.7	YES	YES	NO	NO
Barrier 026	G.1.7	YES	YES	NO	NO
Barrier 028	G.1.7	NO	N/A	N/A	NO
Barrier 033	G.1.9	YES	YES	NO	NO

[78] Figures referenced are included in **Appendix G4.**

Barrier	Figure 78	Technical Feasibility (≥5 dB Reduction)[1]	Constructability	Economic Feasibility	Overall Feasibility
Barrier 034	G.1.9	YES	YES	NO	NO
Barrier 035	G.1.9	YES	YES	NO	NO
Barrier 040	G.1.10	YES	NO[2]	NO	NO
Barrier 041	G.1.10	YES	YES	YES	YES
Barrier 043	G.1.10	YES	YES	NO	NO
Barrier 044	G.1.10	YES	NO[3]	N/A	NO
Barrier 048	G.1.9	YES	YES	NO	NO
Barrier 49N	G.1.11	NO	NO[4]	N/A	NO
Barrier 49S	G.1.11	NO	NO[4]	N/A	NO
Barrier 50S	G.1.11	NO	NO[4]	N/A	NO
Barrier 50N	G.1.11	NO	NO[4]	N/A	NO
Barrier 51N	G.1.11	YES	YES	NO	NO
Barrier 052	G.1.11	YES	YES	YES	YES
Barrier 53N	G.1.11	YES	YES	NO	NO
Barrier 53S	G.1.11	YES			
Barrier 54S	G.1.11	YES	YES	YES	YES
Barrier 54M	G.1.11	YES			
Barrier 54N	G.1.11	YES			

Notes: [1] Technical feasibility check to determine if any single receptor behind a barrier gets a 5dB reduction as a result of the barrier.
[2] Barrier interferes with existing or future station.
[3] Limits of line of sight impacts to be determined in detailed design.
[4] Moving noise barrier closer to corridor would reduce MX access to its own RoW
[5] Barriers in rural areas not sent to the CEC for constructability review. Barrier deemed economically infeasible based on screening level economic feasibility calculation.

TABLE 4-54: SUMMARY OF BARRIER FEASIBILITY (BARRIERS 55 TO 82 OF 133)

Barrier	Figure[79]	Technical Feasibility (>5 dB Reduction)	Constructability	Economic Feasibility	Overall Feasibility
Barrier 055	G.1.11	YES	YES	NO	NO
Barrier 056	G.1.11	YES	NO[2]	N/A	NO
Barrier 057	G.1.12	YES	YES	YES	YES
Barrier 058	G.1.12	YES	YES	NO	NO
Barrier 059	G.1.12	YES	YES	NO	NO
Barrier 060	G.1.12	YES	YES	NO	NO
Barrier 061	G.1.12	YES	NO[2]	NO	NO
Barrier 062	G.1.12	NO	N/A	N/A	NO
Barrier 063	G.1.12	YES	YES	NO	NO
Barrier 064	G.1.12	YES	YES	NO	NO
Barrier 065	G.1.12	YES	YES	NO	NO
Barrier 066	G.1.12	YES	YES	NO	NO
Barrier 067	G.1.12	YES	YES	NO	NO
Barrier 068	G.1.13	YES	YES	NO	NO
Barrier 069	G.1.13	YES	YES	NO	NO
Barrier 070	G.1.13	YES	YES	NO	NO
Barrier 072	G.1.13	YES			
Barrier 071	G.1.13	YES	YES	NO	NO
Barrier 073	G.1.13	YES	N/A [5]	NO [5]	NO
Barrier 074	G.1.14	YES	N/A [5]	NO [5]	NO
Barrier 075	G.1.14	YES	N/A [5]	NO [5]	NO
Barrier 076	G.1.14	YES	N/A [5]	NO [5]	NO
Barrier 077	G.1.14	YES	N/A [5]	NO [5]	NO
Barrier 078	G.1.14	YES	N/A [5]	NO [5]	NO
Barrier 079	G.1.14	YES	YES	NO	NO
Barrier 080	G.1.14	YES	N/A [5]	NO [5]	NO
Barrier 081	G.1.15	YES	N/A [5]	NO [5]	NO
Barrier 082	G.1.15	YES	NO[2]	NO	NO

Notes: [1] Technical feasibility check to determine if any single receptor behind a barrier gets a 5dB reduction as a result of the barrier.
[2] Barrier interferes with existing or future station.
[3] Limits of line of sight impacts to be determined in detailed design.
[4] Moving noise barrier closer to corridor would reduce MX access to its own RoW
[5] Barriers in rural areas not sent to the CEC for constructability review. Barrier deemed economically infeasible based on screening level economic feasibility calculation.

[79] Figures referenced are included in **Appendix G4.**

TABLE 4-55: SUMMARY OF BARRIER FEASIBILITY (BARRIERS 83-111 OF 133)

Barrier	Figure[80]	Technical Feasibility (>5 dB Reduction)	Constructability	Economic Feasibility	Overall Feasibility
Barrier 083	G.1.15	YES	YES	NO	NO
Barrier 084	G.1.14	NO	N/A	N/A	NO
Barrier 085	G.1.14	NO	N/A	N/A	NO
Barrier 086	G.1.15	NO	N/A	N/A	NO
Barrier 087	G.1.15	NO	N/A	N/A	NO
Barrier 088	G.1.16	YES	N/A [5]	NO [5]	NO
Barrier 090	G.1.16	YES	N/A [5]	NO [5]	NO
Barrier 091	G.1.16	YES	N/A [5]	NO [5]	NO
Barrier 092	G.1.16	YES	N/A [5]	NO [5]	NO
Barrier 093	G.1.16	YES	N/A [5]	NO [5]	NO
Barrier 094	G.1.16	YES	N/A [5]	NO [5]	NO
Barrier 095	G.1.16	YES	N/A [5]	NO [5]	NO
Barrier 096	G.1.16	YES	N/A [5]	NO [5]	NO
Barrier 097	G.1.16	YES	N/A [5]	NO [5]	NO
Barrier 098	G.1.17	YES	YES	NO	NO
Barrier 100	G.1.17	YES			
Barrier 099	G.1.17	YES	YES	NO	NO
Barrier 101	G.1.17	YES			
Barrier 102	G.1.17	NO	NA	N/A	NO
Barrier 103	G.1.17	NO	NA	N/A	NO
Barrier 104	G.1.17	YES	N/A [5]	NO [5]	NO
Barrier 105	G.1.17	NO	N/A	N/A	NO
Barrier 106	G.1.17	NO	N/A	N/A	NO
Barrier 107	G.1.17	YES	N/A [5]	NO [5]	NO
Barrier 108	G.1.17	NO	N/A	N/A	NO
Barrier 109	G.1.18	NO	N/A	N/A	NO
Barrier 110	G.1.18	YES	YES	NO	NO
Barrier 111	G.1.18	YES	YES	NO	NO

Notes: [1] Technical feasibility check to determine if any single receptor behind a barrier gets a 5dB reduction as a result of the barrier.
[2] Barrier interferes with existing or future station.
[3] Limits of line of sight impacts to be determined in detailed design.
[4] Moving noise barrier closer to corridor would reduce MX access to its own RoW
[5] Barriers in rural areas not sent to the CEC for constructability review. Barrier deemed economically infeasible based on screening level economic feasibility calculation.

[80] Figures referenced are included in **Appendix G4.**

TABLE 4-56: SUMMARY OF BARRIER FEASIBILITY (BARRIERS 112-133 OF 133)

Barrier	Figure[81]	Technical Feasibility (>5 dB Reduction)	Constructability	Economic Feasibility	Overall Feasibility
Barrier 112	G.1.18	YES	YES	NO	NO
Barrier 113	G.1.18	YES	YES	NO	NO
Barrier 114	G.1.18	NO	N/A	N/A	NO
Barrier 115	G.1.18	YES	N/A [5]	NO [5]	NO
Barrier 116	G.1.18	NO	N/A	N/A	NO
Barrier 119	G.1.19	YES	N/A [5]	NO [5]	NO
Barrier 120	G.1.19	YES	YES	NO	NO
Barrier 121	G.1.19	YES	N/A [5]	NO [5]	NO
Barrier 122	G.1.19	YES	N/A [5]	NO [5]	NO
Barrier 123	G.1.19	NO	N/A	N/A	NO
Barrier 124	G.1.20	YES	N/A [5]	NO [5]	NO
Barrier 125	G.1.20	YES	N/A [5]	NO [5]	NO
Barrier 127	G.1.20	YES	YES	NO	NO
Barrier 128	G.1.20	NO	N/A	N/A	NO
Barrier 129	G.1.20	YES	YES	NO	NO
Barrier 130	G.1.20	YES	YES	NO	NO
Barrier 131	G.1.20	YES	N/A [5]	NO [5]	NO
Barrier 132	G.1.20	YES	N/A [5]	NO [5]	NO
Barrier 133	G.1.22	YES	YES	YES	YES
Summary (Table 5.1 through 5.4)					
Number of "Yes"		82	48	5	5
Number of "No"		21	11	70	95
Number "Not Assessed"		0	44	25	0

Notes: [1] Technical feasibility check to determine if any single receptor behind a barrier gets a 5dB reduction as a result of the barrier.
[2] Barrier interferes with existing or future station.
[3] Limits of line of sight impacts to be determined in detailed design.
[4] Moving noise barrier closer to corridor would reduce MX access to its own RoW
[5]Barriers in rural areas not sent to the CEC for constructability review. Barrier deemed economically infeasible based on screening level economic feasibility calculation.

4.5.7.2 Operational Vibration Assessment

Where sensitive receptors fall within areas of influence where operational vibration levels are expected to exceed the MOEE/GO Protocol vibration limits, mitigation is recommended. Of the 60 switches included in this assessment, 25 triggered assessment of mitigation. Of the approximately 70 km of trackwork, 1.7 km triggered assessment of mitigation. These results are summarized in **Table 4-57**.

Where vibration mitigation is recommended, further evaluation based on administrative, operational, economic and technical feasibility should be completed at the detailed design stage. The recommended vibration mitigation is identified as ballast mats, though consideration of other mitigation options, such as under sleeper pads or resilient fixation can be assessed at the detailed design stage.

[81] Figures referenced are included in **Appendix G4.**

TABLE 4-57: SUMMARY OF VIBRATION MITIGATION REQUIRED

New Infrastructure Assessed	Location	Mitigation Required?	Receptors Affected
Switch	Mile 6.67	Yes	Homes along Rankin Cres, and Carpenter St.
Switch	Mile 6.76	Yes	Home along Sarnia Ave, and Campbell Ave.
Switch	Mile 6.56	Yes	
Switch	Mile 6.66	Yes	
Switch	Mile 22.42	Yes	Homes along Hartley Ct.
Switch	Mile 28.24	Yes	Homes along Ridgefield Cres, Marlott Rd, and Lauderdale Dr.
Switch	Mile 28.33	Yes	
Switch	Mile 41.84	Yes	Homes on 15th Side Road
Switch	Mile 47.88	Yes	Homes along Berczy St.
Switch	Mile 48.43	Yes	Homes along Birch Ct.
Switch	Mile 48.43	Yes	
Switch	Mile 48.49	Yes	
Switch	Mile 48.57	Yes	Homes along Birch Ct, and Walton Dr.
Switch	Mile 48.64	Yes	Homes along Walton Dr.
Switch	Mile 48.72	Yes	
Switch	Mile 54.5	Yes	Townhomes along Robertson Pl.
Switch	Mile 54.57	Yes	Townhomes along Robertson Pl, and Queen St.
Switch	Mile 54.65	Yes	
Switch	Mile 98.33	Yes	Homes along Cox Mill Rd.
Switch	Mile 98.84	Yes	Retirement living on Hurst Dr, and homes along Little Ave.
Switch	Mile 100.62	Yes	Homes along Cumberland St.
Switch	Mile 100.67	Yes	
Switch	Mile 100.74	Yes	
Switch	Mile 101.24	Yes	Home along Gowan St.
Switch	Mile 101.29	Yes	
New Track from Dundas Street to Bradford GO Station	Whytock Ave to Dublin St - 40 m	Yes	Apartment building on St Helens Ave.
	Sarnia Ave to Dupont St - 165 m	Yes	Townhomes along Antler St.
	Lambert Ave to Rogers Rd - 510 m	Yes	St Nicholas of Bari Catholic School. Homes Innes Ave, Gilbert Ave, Norman Ave, and Lambert Ave.
	King Vaughan Rd to McDonald Ave - 75 m	Yes	Home on King Vaughan Rd.
	Dufferin St to Regional Road 40 - 90 m	Yes	Homes along 15tth Sideroad (Regional Road 40)
	Henderson Dr to Yonge St - 135 m	Yes	Homes along Thompkins Cres.
	Queen St to Ontario St - 130 m	Yes	Homes along Queen St, and Ontario St.
	Simon St to Penn Ave - 155 m	Yes	Homes along Franklin St.

New Infrastructure Assessed	Location	Mitigation Required?	Receptors Affected
	Chapman St to Holland Landing Rd - 195 m	Yes	Homes along Holland Landing Rd.
	Spruce Ave to Toby Ct - 170 m	Yes	
New Track from 6th Line to Allandale GO	Kingsridge Rd to Cox Mill Rd - 70 m	Yes	Home on Cox Mill Rd.

4.5.7.3 Potential Effects and Mitigation Measures

Operational Noise Assessment

Adjusted Noise Impacts were determined in accordance with the MOEE/GO Protocol. Adjusted Noise Impacts at many receptors along the corridor were deemed significant (i.e., between 5 dB and 9.99 dB) or very significant (i.e., greater than 10 dB). Mitigation was investigated for these areas and determined to be technically and economically feasible for 4 barriers (Barrier 041, Barrier 052, Barrier 054, and Barrier 057) spanning a total length of approximately 3.8 km.

For electric traction power facilities (TPF), the predicted noise levels at nearby receptors were below the applicable limits at the Maple Paralleling Station and above the applicable limits for the other three TPFs. Therefore, a detailed assessment and potentially noise mitigation for electric traction power facilities is required.

For the Allandale Layover, the predicted noise levels exceeded the applicable limits at nearby receptors. The barrier investigated (Barrier 133), with an approximate length of 0.4 km, was technically and economically feasible. For all other layover sites, the predicted noise levels at nearby receptors were below the applicable limits.

Operational Vibration Assessment

Predicted vibration effects for both new trackwork and switches were found to exceed the MOEE/GO Protocol limits. Vibration mitigation was recommended for 25 of the 60 new switches, and approximately 1.7 km of the 70 km of new trackwork. The recommended vibration mitigation is identified as ballast mats, though consideration of other mitigation options, such as under sleeper pads or resilient fixation. Further evaluation of the mitigation options based on administrative, operational, economic and technical feasibility should be completed at the detailed design stage.

4.5.8 Visual

A Visual Assessment Report (refer to **Appendix H**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-131**.

4.5.8.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.8.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.8.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

4.5.8.3.1 Potential Effects and Mitigation Measures

This section includes the York University GO Station and is entirely designated as an *Employment/Industrial* area. Therefore, this is classified as having *Negligible* visual impacts due to the

existing *Industrial* uses in the surrounding area. Passengers at York University GO Station are not expected to experience additional visual impacts beyond what was previously documented as part of the 2017 GO Rail Network Electrification EPR as a result of additional OCS infrastructure.

There are no anticipated impacts from the proposed OCS infrastructure in this section; therefore, no mitigation measures have been proposed.

4.5.8.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.8.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.8.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

4.5.8.6.1 Potential Effects and Mitigation Measures

This section consists mostly of *Mixed Use*, *Residential* and *Park/Open Space* land uses along the corridor. The Sheppard's Bush Conservation Area and residential homes are in close proximity to the railroad. These areas are categorized as having a *Negligible* visual impact since this is an urbanized area where rail infrastructure already exists as part of their views. Impacts to the existing views of the corridor will be *Negligible* because the additional OCS infrastructure is within the existing rail ROW.

There are no anticipated impacts from the OCS infrastructure in this section; therefore, no mitigation measures have been proposed.

4.5.8.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

4.5.8.7.1 Potential Effects and Mitigation Measures

This section traverses various land uses, including *Residential*, *Employment/Industrial*, *Parks/Open Space* and *Institutional*. These areas are categorized as having a *Negligible* visual impact since this is an urbanized area where rail infrastructure already exists as part of their views. Impacts to the existing views of the corridor will be *Negligible* because the additional OCS infrastructure is within the existing rail ROW.

This section continues into the Town of Aurora where the corridor passes through areas of *Residential* development on the west side of the corridor. Houses in these areas are classified as having potential *Negligible* visual impact due to the proposed additional OCS infrastructure being within the existing Metrolinx rail ROW. *Employment/Industrial, Natural Area* and *Parks/Open Space* properties also surround the corridor; however, since the track infrastructure already exists as part of their views, these areas are also classified as *Negligible* visual impact and require no mitigation. Extending beyond the Aurora GO Station and into the Town of Newmarket, the corridor passes through a *Residential* development and two large parks, the Foxtail Ridge Rear Park and Bailey Ecological Park on the west side of the corridor, while a golf course is located on the east side. These areas surrounding the corridor are classified as *Negligible* visual impacts and require no mitigation, as the proposed OCS infrastructure will be located within the rail ROW.

The corridor continues through Bailey Ecological Park where the surrounding area is classified as a *Negligible* visual impact and requires no mitigation. The track infrastructure already exists as part of the general visual environment, therefore, impacts to the existing views of the corridor will be *Negligible* because the additional OCS infrastructure is within the existing rail ROW. It continues through an *Employment/Industrial* area and two large parks, the Fairy Lake Park and Bailey Ecological Park. These areas surrounding the corridor are classified as *Negligible* visual impacts due to the track infrastructure

already existing as part of the general view. Impacts to the existing views of the corridor will be *Negligible* because the proposed OCS infrastructure is within the existing rail ROW.

This section extends north within the Town of Newmarket where the corridor passes through several land uses, including residential, employment/industrial and parks/open space areas. These areas are classified as having *Negligible* visual impact and require no mitigation. Fairy Lake Park is located east of the corridor, but since the additional OCS infrastructure is within the existing rail ROW, this area has also been classified as a *Negligible* visual impact. It passes through a developed area primarily designated as residential and mixed use. Since the additional OCS infrastructure is within the existing rail ROW, and the corridor already exists as part of the general view, this area has been classified as a *Negligible* visual impact.

The latter section of this corridor is comprised primarily of mixed uses. Since the additional OCS infrastructure will be located within the rail ROW, this segment is classified as having *Negligible* visual impacts. The corridor passes through a variety of land uses, including *Residential*, *Natural Area* and *Parks/Open Space*. These areas are classified as having a *Negligible* visual impact and require no mitigation due to the corridor existing as part of the current view. Bayview Park is adjacent to the corridor, but since the additional OCS infrastructure is within the existing railroad ROW, this area has also been classified as a *Negligible* visual impact.

There are no anticipated impacts from the OCS infrastructure in this section; therefore, no mitigation measures have been proposed.

4.5.8.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.8.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.8.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.8.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.8.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

4.5.8.12.1 Potential Effects and Mitigation Measures

Within this section, the corridor passes through several land uses, including *Residential*, *Natural Area*, *Commercial* and Parks/*Open Space*. These areas are classified as having a *Negligible* visual impact and require no mitigation due to the corridor existing as part of the current view and the additional OCS infrastructure being located within the existing rail ROW. It consists of *Commercial*, *Parks/Open Space* and *Residential* land uses along the corridor. Allandale Station Park is located adjacent to the corridor, but since the additional OCS infrastructure is within the existing rail ROW, this area has been classified as a *Negligible* visual impact and requires no mitigation.

This section includes the Allandale GO Station and is comprises primarily *Residential* and *Mixed* land uses. Since the additional OCS infrastructure is within the existing Metrolinx rail ROW, it is classified as having *Negligible* visual impacts. Allandale GO Station passengers are not expected to experience major visual impacts, beyond what was previously documented as part of the 2017 GO Rail Network Electrification EPR (see **Figure 4-15**).

There are no additional anticipated impacts from the OCS infrastructure in this section; therefore, no mitigation measures have been proposed.

FIGURE 4-15: EXISTING ALLANDALE GO STATION – EAST VIEW FROM GOWAN STREET

4.5.9 Utilities

A Utilities Assessment Report (refer to **Appendix I**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-132**.

4.5.9.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.9.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.9.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

4.5.9.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.9.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.9.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

4.5.9.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

4.5.9.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.9.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.9.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.9.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.9.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

4.5.10 EMI & EMF

An EMI & EMF Assessment Report (refer to **Appendix J**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-133**.

Throughout this corridor, as with all other corridors under study for the impact assessment, the potential effects and mitigations are identical. This is true regardless of the presence of a layover facility in the territory.

4.5.10.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.10.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.10.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

4.5.10.3.1 Potential Effects and Mitigation Measures

The potential effects due to operating an electrified transit system for this segment are largely the result of overhead catenary wires to power the train, and the operation of 25kV aerial feeder lines to power the catenary. They are summarized as follows:

- EMI;
- Time-Varying EMFs;
- Induced Current in Neighbouring Metallic Wires, Fences, Pipelines, Cables, and Earth (grounding) Networks;
- Unintended Contact with High-Voltage Source; and
- ELF EMF

The EMI would be the result of high frequency generated by the scraping of the pantograph down the catenary and the motors used to power the train. The EMFs would be the result of current flow down the catenary and within the passenger compartments of the train. The induced current would be the result of current flow down the catenary or the feeder wires. The unintended contact with the high-voltage source would be the result of access to the catenary, live wires inside the passenger compartment, or access to the feeder wires.

Mitigation for each of these potential effects has been implemented as part of the design of the system. In a general sense, for EMI, the power methodology for the Metrolinx system—auto-transformer power—has been selected specifically for its reduction of this type of interference. Additional mitigation methodologies include the following:

- Implementation and use of an EMC Control Plan.
- Proper design, e.g., grounding and shielding as per applicable Canadian electrical standards, physical separation, as identified from bench-marking similar properties across North America.
- During the electrification commissioning phase, overall ELF and RF emissions emanating from the GO electrified railway system as a whole will be field tested and verified to ensure EMFs are within the limits of applicable industry standards.
- Verify ELF EMF by measurements taken before and after project implementation.

4.5.10.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.10.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.10.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

4.5.10.6.1 Potential Effects and Mitigation Measures

Potential effects and mitigation measures associated with EMI & EMF at this location are detailed in Section 4.5.10.3.

4.5.10.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

4.5.10.7.1 Potential Effects and Mitigation Measures

Potential effects and mitigation measures associated with EMI & EMF at this location are detailed in Section 4.5.10.3.

4.5.10.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.10.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.10.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.10.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.10.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

4.5.10.12.1 Potential Effects and Mitigation Measures

Potential effects and mitigation measures associated with EMI & EMF at this location are detailed in Section 4.5.10.3.

4.5.11 Stormwater Management

A Preliminary Stormwater Management Assessment (refer to **Appendix K**) has been prepared which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-134**.

4.5.11.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.11.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.11.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of detailed design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

4.5.11.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.11.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.11.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of detailed design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

4.5.11.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of Detailed Design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

4.5.11.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.11.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.11.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.11.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.11.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of detailed design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

4.5.12 Groundwater and Wells

A Hydrogeological Assessment Study (refer to **Appendix L**) has been prepared which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-135**.

4.5.12.1 OCS: Section BR-1 – Parkdale Junction to Caledonia Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.12.2 OCS: Section BR-2 – Caledonia Station to Downsview Park Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.12.3 OCS: Section BR-3 – Downsview Park Station to Rutherford Station

4.5.12.3.1 Potential Effects and Mitigation Measures

There are no anticipated footprint impacts of the proposed tracks in this segment; therefore, no mitigation measures have been proposed.

4.5.12.4 OCS: Section BR-4 – Rutherford Station to King City Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.12.5 OCS: Section BR-5 – King City Station to Bathurst Street

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.12.6 OCS: Section BR-6 – Bathurst Street to Aurora Station

4.5.12.6.1 Potential Effects and Mitigation Measures

Tannery Creek and Holland River East Branch are located approximately 300 metres away from the study area, with significant physiographic barriers between the areas of impact and the watercourses. Therefore, there are no anticipated impacts associated with any potential on-going dewatering activities. Additionally, the infrastructure footprint is not anticipated to have an impact on the WHPAs.

The additional OCS infrastructure footprint is expected to be less than 1 (one) metre in depth and therefore is not expected to cause any adverse groundwater impacts. It is noted that review of well logs for the area suggest groundwater elevations at depths around two (2) metres. However, surficial soils were generally described as being silty clay tills of low permeability, and the groundwater elevations may represent perched conditions. Therefore, the need for dewatering may be limited.

Based on the above information, there is not anticipated to be any adverse footprint impacts due to the footprint of the OCS infrastructure, to the supply wells, groundwater, or Tannery Creek and Holland River East Branch. Therefore, no mitigation measures are recommended.

4.5.12.7 OCS: Section BR-7 – Aurora Station to East Gwillimbury Station

4.5.12.7.1 Potential Effects and Mitigation Measures

The subsurface footprint of the OCS foundations is relatively small and shallow and therefore not expected to cause any adverse groundwater impacts.

There were no other anticipated impacts of the proposed tracks in this section, therefore, no mitigation measures have been proposed.

4.5.12.8 OCS: Section BR-8 – East Gwillimbury Station to Bradford Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.12.9 OCS: Section BR-9 – Bradford Station to 13th Line

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.12.10 OCS: Section BR-10 – 13th Line to 6th Line Section

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.12.11 OCS: Section BR-11 – 6th Line Section to Barrie South Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.5.12.12 OCS: Section BR-12 – Barrie South Station to Allandale Waterfront Station

4.5.12.12.1 Potential Effects and Mitigation Measures

The subsurface footprint of the OCS foundations is relatively small and shallow and therefore not expected to cause any adverse groundwater impacts.

There were no other anticipated impacts of the proposed tracks in this section; therefore, no mitigation measures have been proposed.

4.6 Stouffville Rail Corridor

4.6.1 Natural Environment

A Natural Environment Impact Assessment Report (refer to **Appendix A**) was prepared, which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-123** and **Table 4-124**.

4.6.1.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.1.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.1.3 OCS: Section SV-3 – Milliken Station to Unionville Station

4.6.1.3.1 Potential Effects and Mitigation Measures

4.6.1.3.1.1 Terrestrial

4.6.1.3.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report prepared as part of the 2017 GO Rail Network Electrification EPR. Impacts to the following communities were identified as part of the 2017 assessment: Commercial and Institutional (CVC), Transportation and Utilities (CVI), Residential (CVR), Deciduous Forest (FOD), Cultural Woodland (CUW), and Cultural Meadow (CUM) communities. Additional vegetation removal areas within Section SV-3 associated with the additional OCS infrastructure are presented in **Table 4-58** and depicted in **Appendix A, Figures SV-18** to **SV-19.**

The Transportation and Utility (CVI) lands that include the existing rail corridor are comprised of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to

disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due minimal canopy cover. Mitigation for CVI areas include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, vegetation removals within Cultural Meadow (CUM) communities will be required within the vegetation clearing zone. While vegetation removals are required within these areas, the areas are highly urban, and they provide limited habitat for wildlife. Therefore, the removals within these areas are considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CUM communities, the extent of tree removals in these areas is minor. Mitigation for these areas include compliance with the general mitigation measures for vegetation/tree clearing identified below.

Details relating to impacted areas within Toronto and Region Conservation Authority (TRCA) Regulated Areas are in Section 4.6.1.3.1.4.

TABLE 4-58: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES SV-3*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Transportation and Utilities (CVI)	0	0.248	0.248	Minor
Cultural Meadow (CUM)	0	0.017	0.017	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*
***ELC classification from North-South Environmental Inc., 2016 report*

Mitigation Measures

- The following mitigation measures, which are common to all ELC communities, will be implemented to minimize/mitigate the potential impacts related to vegetation/tree removals: Vegetation Management in accordance with Metrolinx's Vegetation Guideline (2020) will include:
    - **Detailed Tree Inventory** – All trees 10 centimetres or greater in diameter within the study area or with canopies or TPZ extending into the study area. SAR that may be directly impacted by the tree removal shall be identified during the tree inventory to the extent possible using tree inventory methods. This includes identification of tree SAR such as Butternut as well as information on the potential suitable habitat for SAR, such as the presence of bat cavity trees, where visible.
    - **Tree Protection** – Detailed measures to protect retained adjacent trees. This will include TPZ limits, diagram of tree protection barrier type, tree protection measures, and construction storage and staging areas where information is available. Refer to Section 4.9.1 for detailed tree protection measures during construction.
    - **Vegetation Compensation** – Metrolinx has established a vegetation compensation approach for determining and implementing compensation for the removal of trees from the Metrolinx ROW as well as public and private lands. It is a landscape science-based approach designed to reflect the basic principles of the TRCA's ecosystem-based approach in addition to following the requirements of applicable bylaws. Compensation will follow one or a combination of the following approaches: ecological, baseline, or bylaw.
    - **For Trees within Metrolinx Property:** All trees within the Metrolinx ROW will be compensated for using either an ecological or baseline approach. Where tree removals are located within a designated natural area, ecological compensation will be implemented.

Where removals are outside a designated natural area, a 1:1 ratio approach will be implemented (baseline compensation).

- **For Public/Private Trees:** Compensation for trees within public and private lands, including those on the boundary between the Metrolinx ROW and public or private lands, will follow with the requirements of applicable bylaws. Trees on public or private lands that are not subject to bylaws/regulations will be compensated for following an ecological or baseline approach. Metrolinx will work directly with residents to address the loss of trees on private property.
- **Tree End Use:** Options for the end use of trees removed from Metrolinx property (e.g. reuse/recycling options) will be developed as per the recommendations in the guideline.

- Metrolinx will make efforts to comply with the *Forestry Act* in relation to trees planted on the boundary between two lands (i.e., lands that are Metrolinx owned and lands that are not Metrolinx owned); and
- Compliance with the MBCA.

4.6.1.3.1.2 Aquatic

There are no watercourses within the additional OCS infrastructure areas, and therefore no aquatic footprint impacts.

4.6.1.3.1.3 Species at Risk

Given the low potential of occurrence of Monarch and Nine-spotted Lady Beetle, there are no anticipated footprint impacts to these species or their habitat.

4.6.1.3.1.4 Designated Areas

There are no footprint impacts within any designated areas.

4.6.1.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

4.6.1.4.1 Potential Effects and Mitigation Measures

4.6.1.4.1.1 Terrestrial

4.6.1.4.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report prepared as part of the 2017 GO Rail Network Electrification EPR. Impacts to the following communities were identified as part of the 2017 assessment: Commercial and Institutional (CVC), Transportation and Utilities (CVI), Residential (CVR), Green Land (CGL), Deciduous Woodland (WOD), Cultural Meadow (CUM), Marsh (MA) and Swamp (SW) communities. Additional vegetation removal areas with Section SV-4 associated with the additional OCS infrastructure, including new track in proximity to the Unionville Storage Yard are presented in **Table 4-59** and depicted in **Appendix A, Figures SV-19** to **SV-20**.

The Transportation and Utility (CVI) lands that include the existing rail corridor are comprised of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due minimal canopy cover. Mitigation of CVI areas include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, vegetation removals within Cultural Meadow (CUM) lands will be required within the vegetation clearing zone. While vegetation removals are required within these areas, the areas are highly urban, and they provide limited habitat for wildlife. Therefore, the removals within these areas are

considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CUM communities, the extent of tree removals in these areas is minor. Mitigation for these areas include compliance with the general mitigation measures for vegetation/tree clearing identified below.

The construction footprint of the new Unionville Storage Yard will require vegetation removal beyond areas included within this addendum study area. Therefore, these additional impacts related to vegetation removal have been addressed within the New Track & Facilities TPAP Draft Natural Environment Impact Assessment Report (Gannett Fleming, 2020).

Details relating to impacted areas within Toronto and Region Conservation Authority (TRCA) Regulated Areas are in Section 4.6.1.4.1.4.

TABLE 4-59: SUMMARY OF ADDIITONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES SV-4*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Transportation and Utilities (CVI)	0	0.0001	0.0001	Minor
Cultural Meadow (CUM)	0.128	0.032	0.160	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

Mitigation Measures

Mitigation measures related to vegetation clearing consist of vegetation management as per the **Metrolinx *Vegetation Guideline*** (2020) and additional measures detailed in Section 4.6.1.3.1.1.1**.**

4.6.1.4.1.2 Aquatic

There is one watercourse within the additional OCS infrastructure areas: the Rouge River. The watercourse corridor associated with Rouge River is classified as Valleyland/Stream Corridors and is part of the City of Markham's Natural Heritage Network. No adverse effects to the Rouge River are anticipated to result from the installation of OCS structures as they are located away from the watercourse. To mitigate the potential indirect impacts to the watercourse, sediment and erosion controls will be implemented, and required precautions will be taken to prevent spills and the release of hazardous materials.

4.6.1.4.1.3 Species at Risk

Given the low potential of occurrence of Monarch and Nine-spotted Lady Beetle, there are no anticipated footprint impacts to these species or their habitat.

No footprint impacts to the Rouge River will occur. Regulated habitat for Redside Dace has been identified within the Rouge River (Occupied). The regulation for Redside Dace under the *Endangered Species Act* (ESA), 2007 includes the meander belt width plus thirty (30) metres; therefore, additional consultation with the MECP during detailed design will be required for any work that occurs within the regulated area, especially as it relates to sediment and erosion control measures associated with construction or site disturbance activities. Footprint impacts within Redside Dace regulated areas should be minimized to the greatest extent possible.

4.6.1.4.1.4 Designated Areas

There are no footprint impacts within TRCA Regulated Areas and the CVI communities. Footprint impacts to CUM lands within TRCA Regulated Areas are identified in **Table 4-60**. Impacts to these

vegetation communities have been discussed within **Section 4.6.1.4.1.1**. Only minor removals within the CUM communities are required outside of the ROW.

An amendment to the Greenbelt Plan to include twenty-one (21) major urban river valleys came into effect July 1, 2017. This Greenbelt designation was not previously included in the 2017 TPAP. Footprint impacts to CUM lands within the Greenbelt Urban River Valley areas are identified in **Table 4-60**. Footprint impacts within CUM communities exist in culturally influenced non-natural communities. No vegetation removals are required outside the Metrolinx ROW within the CUM communities. However, vegetation removals within these areas should be minimized to the extent possible. Impacts to these vegetation communities have been discussed in **Section 4.6.1.4.1.1**. The urban river valley includes Rouge River, however, this segment of the Rouge River is not included within the Rouge National Urban Park limits and therefore there are no impacts to federal lands associated with the vegetation removals.

Metrolinx has established a Vegetation Compensation framework within the ***Vegetation Guideline*** (2020) for Metrolinx undertakings and vegetation that is removed will be compensated in accordance with the provisions of this framework.

TABLE 4-60: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN DESIGNATED AREAS SV-4*

ELC Community	TRCA Regulation Limit			Greenbelt Urban River Valley			Extent of Tree Removals (based on canopy cover within ELC community)
	Area within ROW (ha)	Area outside Metrolinx ROW (ha)	Total Area (ha)	Area within ROW (ha)	Area outside Metrolinx ROW (ha)	Total Area (ha)	
Transportation and Utilities (CVI)	0	0	0	0	0	0	N/A
Cultural Meadow (CUM)	0.096	0.005	0.101	0.030	0	0.030	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

4.6.1.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

4.6.1.5.1 Potential Effects and Mitigation Measures

4.6.1.5.1.1 Terrestrial

4.6.1.5.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report prepared as part of the 2017 GO Rail Network Electrification EPR. Impacts to the following communities were identified as part of the 2017 assessment: Commercial and Institutional (CVC), Transportation and Utilities (CVI), Residential (CVR), Green Land (CGL), Cultural Meadow (CUM), and Deciduous Thicket (THD). Additional vegetation removal areas within Section SV-5 associated with the additional OCS infrastructure are presented in **Table 4-61** and depicted in **Appendix A**, **Figures SV-25** to **SV-26**.

The Transportation and Utility (CVI) lands that include the existing rail corridor are comprised of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due minimal canopy cover. Mitigation for CVI areas include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, vegetation removals within several other ELC communities including Commercial and Institutional (CVC), Green Land (CGL), and Cultural Meadow (CUM) will be required within the vegetation clearing zone. While vegetation removals are required within these areas, the areas are highly urban, and they provide limited habitat for wildlife. Therefore, the removals within these areas are considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CVC, CGL and CUM communities, the extent of tree removals in these areas is minor. Mitigation of these areas include compliance with the general mitigation measures for vegetation/tree clearing identified below.

Details relating to impacted areas within TRCA Regulated Areas are in **Section 4.6.1.5.1.4**.

TABLE 4-61: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES SV-5*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Commercial and Institutional (CVC)	0.00001	0	0.00001	Minor
Transportation and Utilities (CVI)	0.017	0.016	0.033	Minor
Green Land (CGL)	0.017	0.120	0.137	Minor
Cultural Meadow (CUM)	0.060	0.112	0.172	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

Mitigation Measures

Mitigation measures related to vegetation clearing consist of vegetation management as per the Metrolinx's *Vegetation Guideline* (2020) and additional measures detailed in Section 4.6.1.3.1.1.1.

4.6.1.5.1.2 Aquatic

There is one watercourse within the corridor section: Mt. Joy Creek. The watercourse corridor is identified as Valley/Stream Corridor and is part of the City of Markham Natural Heritage Network. This crossing is located on the division line between SV-5 and SV-6. Mt. Joy Creek is conveyed under the corridor by a culvert; therefore, no footprint impacts to the culvert or watercourse are anticipated to result from the installation of OCS within the existing corridor above the culvert. To mitigate the potential indirect impacts to the watercourse, sediment and erosion controls will be implemented and required precautions will be taken to prevent spills and the release of hazardous materials.

4.6.1.5.1.3 Species at Risk

Given the low potential of occurrence of Monarch, Nine-spotted Lady Beetle, and Chimney Swift there are no anticipated footprint impacts to these species or their habitat.

Butternuts have a low potential of occurrence in the CGL communities. The presence/absence of Butternuts will be confirmed during detailed design. Should any Butternuts be identified, a health assessment will be required for any pure Butternuts. Dependent on the number and condition of individuals found, approval under the ESA, 2007 may include a registration and/or permitting process. Protective measures for any Butternuts within 50 metres of the construction footprint that do not need to be removed should be implemented.

While the Red-headed Woodpecker has a moderate potential of occurrence in the CGL communities, this species is generally tolerant of disturbance, and individual tree removals within the CGL are not anticipated to have an impact on this species. While there are footprint impacts to the CGL communities,

the potential loss of habitat for Red-headed Woodpecker associated with tree removals is considered minor in relation to the amount of adjacent un-impacted habitat.

4.6.1.5.1.4 Designated Areas

Footprint impacts to CUM, CVC, CVI, and CGL lands within TRCA Regulated Areas are identified in **Table 4-62**. Impacts to these vegetation communities have been discussed within **Section 4.6.1.5.1.1**. Only minor vegetation clearing within the TRCA Regulated area is required with CVI, CGL, and CUM communities outside of the Metrolinx owned ROW.

An amendment to the Greenbelt Plan to include twenty-one (21) major urban river valleys came into effect July 1, 2017. This Greenbelt designation was not previously included in the 2017 TPAP. Footprint impacts to CUM, CVC, CVI and CGL lands within the Greenbelt Urban River Valley areas are identified in **Table 4-62**. Footprint impacts within CUM, CGL, CVI and CVC communities exist within culturally influenced non-natural communities. No vegetation removals are required outside the Metrolinx ROW within the CVC communities and only minor removals within the CGL, VCI and CUM communities are required inside the ROW. However, vegetation removals within these areas should be minimized to the extent possible. Impacts to these vegetation communities have been discussed within Section 4.6.1.5.1.1.

Metrolinx has established a Vegetation Compensation framework within the ***Vegetation Guideline*** (2020) for Metrolinx undertakings and vegetation that is removed will be compensated for in accordance with the provisions of this framework.

TABLE 4-62: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN DESIGNATED AREAS SV-5*

ELC Community	TRCA Regulation Limit			Greenbelt Urban River Valley			Extent of Tree Removals (based on canopy cover within ELC community)
	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	
Commercial and Institutional (CVC)	0.00001	0	0.00001	0.00001	0	0.00001	Minor
Transportation and Utilities (CVI)	0.004	0.011	0.015	0.006	0.013	0.019	Minor
Green Land (CGL)	0.009	0.036	0.045	0.011	0.045	0.056	Minor
Cultural Meadow (CUM)	0.060	0.109	0.169	0.060	0.112	0.172	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

4.6.1.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

4.6.1.6.1 Potential Effects and Mitigation Measures

4.6.1.6.1.1 Terrestrial

4.6.1.6.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report prepared as part of the 2017 GO Rail Network Electrification EPR. Impacts to the following communities were identified as part of the 2017 assessment: Commercial and Institutional (CVC), Transportation and Utilities (CVI), Residential (CVR), Constructed (CV), Deciduous Woodland (WOD), Cultural Meadow (CUM), Deciduous Thicket (THD), Marsh (MA), Shallow Marsh (MAS), Agriculture (AG), Swamp (SW),

and Deciduous Forest (FOD) communities. Additional vegetation removal areas within Section SV-6 associated with the additional OCS infrastructure are presented in **Table 4-63** and depicted in **Appendix A, Figure SV-26**.

The Transportation and Utility (CVI) lands that include the existing rail corridor are comprised of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due minimal canopy cover. Mitigation for CVI areas include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, vegetation removals within several other ELC communities including Commercial and Institutional (CVC) and Cultural Meadow (CUM) will be required within the vegetation clearing zone. While vegetation removals are required within these areas, they provide limited habitat for wildlife. Therefore, the removals within these areas are considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CVC and CUM communities, the extent of tree removals in these areas is minor. Mitigation for these areas include compliance with the general mitigation measures for vegetation/tree clearing identified below.

Details relating to impacted areas within TRCA Regulated Areas are in **Section 4.6.1.6.1.4**.

TABLE 4-63: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES SV-6*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Commercial and Institutional (CVC)	0.00001	0	0.00001	N/A
Transportation and Utilities (CVI)	0.001	0.007	0.008	Minor
Cultural Meadow (CUM)	0.018	0.098	0.116	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

Mitigation Measures

Mitigation measures related to vegetation clearing consist of vegetation management as per the Metrolinx's *Vegetation Guideline* (2020) and additional measures detailed in Section 4.6.1.3.1.1.1.

4.6.1.6.1.2 Aquatic

There is one watercourse within the corridor section: Mt. Joy Creek (same crossing as SV-5). Mt. Joy Creek is conveyed under the corridor by a culvert; therefore, no footprint impacts to the culvert or watercourse are anticipated to result from the installation of OCS within the existing corridor above the culvert. To mitigate the potential indirect impacts to the watercourse, sediment and erosion controls will be implemented and required precautions will be taken to prevent spills and the release of hazardous materials.

4.6.1.6.1.3 Species at Risk

Given the low potential of occurrence of Monarch, Nine-spotted Lady Beetle, and Chimney Swift there are no anticipated footprint impacts to these species or their habitat.

4.6.1.6.1.4 Designated Areas

Footprint impacts to CUM and CVI lands within TRCA Regulated Areas are identified in **Table 4-64**. No vegetation clearing within the CVC communities will occur and only minor removals within the CVI and

CUM communities are required outside of the Metrolinx owned ROW. Impacts to these vegetation communities are discussed within Section 4.6.1.6.1.1.

An amendment to the Greenbelt Plan to include twenty-one (21) major urban river valleys came into effect July 1, 2017. This Greenbelt designation was not previously included in the 2017 TPAP. Footprint impacts to CUM, CVC, and CVI lands within the Greenbelt Urban River Valley areas are identified in **Table 4-64**. Footprint impacts within CUM, CVI, and CVC communities exist within culturally influenced non-natural communities. No vegetation removals are required outside the Metrolinx ROW within the CVC communities and only minor removals outside the ROW are required in the CUM and CVI communities. However, vegetation removals within these areas should be minimized to the extent possible. Impacts to these vegetation communities are discussed within Section 4.6.1.6.1.1.

Metrolinx has established a Vegetation Compensation framework within the ***Vegetation Guideline*** (2020) for Metrolinx undertakings and vegetation that is removed will be compensated for in accordance with the provisions of this framework.

The limits of the additional OCS infrastructure area is outside of the limits of the Rouge National Urban Park. As such, no impacts are anticipated.

TABLE 4-64: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN DESIGNATED AREAS SV-6*

ELC Community	TRCA Regulation Limit			Greenbelt Urban River Valley			Extent of Tree Removals (based on canopy cover within ELC community)
	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	
Commercial and Institutional (CVC)	0	0	0	0.00001	0	0.00001	Minor
Transportation and Utilities (CVI)	0.001	0.007	0.008	0.001	0.007	0.008	Minor
Cultural Meadow (CUM)	0.017	0.097	0.114	0.018	0.098	0.116	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

4.6.1.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section.

It is noted that as a result of infrastructure proposed as part of the separate Lincolnville Layover and GO Station Improvements TPAP Project completed in 2018, refinements to the 2017 OCS clearance/vegetation removal zone footprint at Lincolnville GO Station was required. The changes were reviewed by Metrolinx and determined to be insignificant in the context of the GO Rail Network Electrification EPR. No further assessment is required as part of this Significant Addendum.

4.6.2 Preliminary Environmental Site Assessment

A Preliminary Environmental Site Assessment (refer to **Appendix B**) was prepared for new layover facilities. A summary of mitigation and monitoring commitments for this section is included in **Table 4-125**.

4.6.2.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.2.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.2.3 OCS: Section SV-3 – Milliken Station to Unionville Station

4.6.2.3.1 Potential Effects and Mitigation Measures

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

4.6.2.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

4.6.2.4.1 Potential Effects and Mitigation Measures

Based on information gathered to-date and observations made, the Phase I ESA has revealed that the likelihood of current significant adverse environmental contaminant impact to the Unionville Storage Yard appears low. A Phase II ESA was also completed as part of a separate undertaking within the same study area in 2015 and found no evidence of soil or groundwater contamination. There are no recommendations made for a Phase II ESA at the subject property at this time.

The following mitigation and monitoring measures will be implemented at the layover facility, pending further assessment:

- Develop a Soil and Excavated Materials Management Plan for the handling, management and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the work. The plan will be overseen by a Qualified Person pursuant to Ontario Regulation 153/04 under the Environmental Protection Act (QP) and will comply with Ontario Regulation 406/19 (On-Site and Excess Soil Management – to be enacted into law on January 1, 2021), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices (April 2019, as amended) and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement, as applicable.
- Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per Ontario Regulation 347 (as amended) and all Applicable Law.
- The Soil and Excavated Materials Management Plan will be reviewed and approved by Metrolinx prior to construction.
- A Soil and Excavated Material Monthly Dashboard Report will be developed by the Constructor for Metrolinx review that includes monitoring and performance data related to the management of excavated materials for the preceding month.
- Upon completion of the work, the Constructor will submit a Soil and Excavated Material Management Implementation Report to Metrolinx.

4.6.2.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

4.6.2.5.1 Potential Effects and Mitigation Measures

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

4.6.2.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

4.6.2.6.1 Potential Effects and Mitigation Measures

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

4.6.2.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.3 Built Heritage Resources and Cultural Heritage Landscapes

Please refer to **Appendix C1** for a description of methodology followed for assessment of Cultural Heritage impacts. Additional details can be found in the Cultural Heritage Technical Memo contained in **Appendix C1**. A summary of mitigation and monitoring commitments for this section is included in **Table 4-126**.

4.6.3.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.3.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.3.3 OCS: Section SV-3 – Milliken Station to Unionville Station

4.6.3.3.1 Potential Effects and Mitigation Measures

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.6.3.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

For Unionville Storage Yard Location, refer to **Figure ST-3** in **Appendix C1**.

4.6.3.4.1 Potential Effects and Mitigation Measures

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.6.3.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

4.6.3.5.1 Potential Effects and Mitigation Measures

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.6.3.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

4.6.3.6.1 Potential Effects and Mitigation Measures

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.6.3.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.4 Archaeology

A Stage 1 Archaeological Assessment Report (refer to **Appendix D**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-127**.

4.6.4.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.4.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.4.3 OCS: Section SV-3 – Milliken Station to Unionville Station

4.6.4.3.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed there are no anticipated impacts of the proposed OCS infrastructure in this section, therefore no mitigation measures have been proposed.

4.6.4.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

4.6.4.4.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2, the area does not retain archaeological potential. No further archaeological assessment is required.

No mitigation measures are required.

4.6.4.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

4.6.4.5.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2, the area does not retain archaeological potential. No further archaeological assessment is required.

No mitigation measures are required.

4.6.4.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

4.6.4.6.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G

Section 1.3.2, the area does not retain archaeological potential. No further archaeological assessment is required.

No mitigation measures are required.

4.6.4.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.5 Land Use and Socio-Economic

A Land Use and Socio-Economic Assessment Report (refer to **Appendix E**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-128**.

4.6.5.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.5.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.5.3 OCS: Section SV-3 – Milliken Station to Unionville Station

4.6.5.3.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area required in this section is located in the City of Markham at the Unionville GO Station. Additional property requirements have been identified as part of the NT&F TPAP in proximity to Unionville GO Station in order to accommodate proposed project infrastructure. The area immediately surrounding the Unionville Station is primarily *Mixed Use* but abuts the Highway 407 and Hydro One transmission corridor. Given the site's existing use as a GO station, this facility is consistent with existing and adjacent uses.

The additional OCS infrastructure associated with the proposed track, platform and train storage facility is anticipated to extend beyond the existing rail right-of-way along this segment; therefore, there are potential property requirements associated with the construction of this infrastructure. As a result, there is a footprint impact on the adjacent mixed-use area and Parkway Belt Plan area land designations.

Lands within this segment are subject to the Markham Centre Secondary Plan area, which is widely considered the City's Downtown. The Secondary Plan encourages vibrant urban growth that is characterized by a diversity of residential, retail, office and public uses that are accessible by public transit. Recognizing that the existing use of the site (i.e. Unionville Go Station) is already established and designated as mixed use, the presence of the additional OCS infrastructure is not anticipated to affect planned land uses for the area. Instead, the proposed infrastructure seeks to facilitate public transit ridership. Additionally, the rail corridor is zoned *Transportation and Utilities* within the City of Markham.

Mitigation Measures

The additional OCS infrastructure area is located in an area of compatible land use with the existing land use and zoning of the property. A range of municipal permits and approvals may be required, and if so, Metrolinx will obtain all required permits and approvals. However, further coordination with the City of Markham will be undertaken during future project phases to finalize design details and minimize any conflicts on adjacent uses. Metrolinx is currently in discussions with the landowners regarding the use of this property and will reach an agreement prior to the commencement of construction activities.

4.6.5.3.2 Socio-Economic – Potential Effects and Mitigation Measures

There are no sensitive facilities adjacent to the additional OCS infrastructure area, and therefore there are no effects anticipated.

There are no recreational amenities within proximity of the additional OCS infrastructure area.

Other potential effects on the socio-economic environment associated with the SV-3 have been assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.6.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.6.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*
- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.6.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.6.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

Ensure that the mitigation recommendations outlined in the respective reports listed above pertaining to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF are adhered to and implemented during Detailed Design and construction.

4.6.5.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

4.6.5.4.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area will be located primarily within the rail ROW in this section. However, there are some areas such as the access road, parking and fencing components of the Unionville Storage Yard that will extend beyond the right of way, where engineering solutions will be required to keep OCS structures within the ROW.

Lands within this segment are subject to the Markham Centre Secondary Plan area, which is widely considered the City's Downtown. The Secondary Plan encourages vibrant urban growth that is characterized by a diversity of residential, retail, office and public uses that are accessible by public transit. Recognizing that the existing use of the site (i.e. Unionville Go Station) is already established and designated as mixed use, the presence of the proposed track, platforms and layover are not anticipated to affect planned land uses for the area. Instead, the proposed infrastructure seeks to facilitate public transit ridership. Additionally, the rail corridor is zoned *Transportation and Utilities* within the City of Markham.

Based on this understanding, the additional OCS at Unionville GO Station is not expected to conflict with existing policies outlined in the Markham Centre Secondary Plan.

Mitigation Measures

The additional OCS infrastructure area is located in an area of compatible land use with the existing land use and zoning of the property. A range of municipal permits and approvals may be required, and if so, Metrolinx will obtain all required permits and approvals. However, further coordination with the City of Markham will be undertaken during future project phases to finalize design details and minimize any conflicts on adjacent uses.

Metrolinx is currently in discussions with the landowners regarding the use of this property and will reach an agreement prior to the commencement of construction activities.

4.6.5.4.2 Socio-Economic – Potential Effects and Mitigation Measures

There are sensitive facilities (school and care centre) within the vicinity of the additional OCS required in the SV-4 corridor, as seen in **Table 4-65**. This facility is approximately 60 m from the OCS impact zone, and therefore there will be no footprint impacts to these sensitive facilities.

TABLE 4-65: SENSITIVE FACILITIES WITHIN THE VICINITY OF THE SV-4 CORRIDOR

Corridor Segment	Type	Name	Address	Distance from 5 m OCS Impact Zone
SV-4	School	Bill Crothers Secondary School	44 Main St Unionville, Unionville	60 m
SV-4	Long Term Care Centre	Unionville Home Society	4300 Highway 7	20 m

A cycling route traverses the rail corridor at the Highway 7 rail crossing and the City of Markham is currently undertaking the design for a trail network through the area that will cross the rail between Highway 7 and Enterprise Drive, however, there are no anticipated footprint impacts to these recreational amenities as a result of this activity. The Rouge Park is located directly adjacent to the rail corridor. There is an anticipated footprint impact to the park as a result of the proposed Unionville Storage Yard.

Other potential effects on the socio-economic environment associated with the SV-4 have been assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.6.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.6.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*
- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.6.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.6.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

Ensure that the mitigation recommendations outlined in the respective reports listed pertaining to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF are adhered to and implemented during Detailed Design and construction.

4.6.5.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

4.6.5.5.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area required in this section is located in the City of Markham south from the Mount Joy GO Station. Additional property requirements have been identified as part of the NT&F TPAP in order to accommodate proposed project infrastructure. The area immediately surrounding the station is *Mixed Use and Natural Area*, including several parks and the Mount Joy Community

Centre. Given the site's existing use as a GO station/corridor, it is consistent with existing and adjacent uses.

Lands within this segment are subject to the Mount Joy Secondary Plan. The Secondary Plan intends for the area to support mixed uses functions that integrate housing, employment, shopping and recreation opportunities at transit supportive densities adjacent to the Mount Joy GO Station. The planned infrastructure will not impact the land uses of the Secondary Plan.

Mitigation Measures

The additional OCS infrastructure area is located in an area of compatible land use with the existing land use and zoning of the property. A range of municipal permits and approvals may be required, and if so, Metrolinx will obtain all required permits and approvals. However, further coordination with the City of Markham will be undertaken during Detailed Design to finalize design details and minimize any conflicts on adjacent uses. Metrolinx is currently in discussions with the landowners regarding the use of this property and will reach an agreement prior to the commencement of construction activities.

4.6.5.5.2 Socio-Economic – Potential Effects and Mitigation Measures

There are three sensitive facilities (community centre and two child care centres) located within the vicinity of the SV-5 corridor, as seen in **Table 4-66**. There are no footprint impacts expected to the Markham Montessori and Little Readers Academy. While there may be footprint impacts to the Mount Joy Community Centre, impacts are not expected to affect the use of the facility and therefore there are no anticipated adverse effects.

TABLE 4-66: SENSITIVE FACILITIES WITHIN THE VICINITY OF THE SV-5 CORRIDOR

Corridor Segment	Type	Name	Address	Distance from 5 m OCS Impact Zone
SV-5	Child Care Centre	Markham Montessori	6007 16th Avenue, Markham	60 m
SV-5	Community Centre	Mount Joy Community Centre	6140 16th Avenue, Markham	10 m
SV-5	Child Care Centre	Little Readers Academy	9275 ON-48 #2, Markham	20 m

Mount Joy Lake Park is the only park adjacent to the rail corridor. The park is located on the eastern side of the rail corridor between 16th Avenue and Bur Oak Avenue. There are no anticipated adverse effects on this park due to the implementation of electrification infrastructure identified as part of the conceptual design developed for the Significant Addendum to the Electrification TPAP. Notwithstanding this, potential conflicts with the park will be reviewed in further detail during the Detailed Design phase, and if required the City of Markham will be consulted to determine appropriate design solutions to mitigate/minimize potential any effects to the parks.

There is an existing multiuse path along Markham Road and a future multiuse path planned along Anderson Avenue to connect Major Mackenzie Drive East with Bur Oak Avenue. There are no anticipated adverse effects on these recreational amenities due to the implementation of electrification infrastructure identified as part of the conceptual design developed for the Significant Addendum to the Electrification TPAP. Notwithstanding this, potential conflicts with recreational amenities will be reviewed in further detail during the Detailed Design phase, and if required the City of Markham will be consulted to determine appropriate design solutions to mitigate/minimize any effects to recreational amenities.

Other potential effects on the socio-economic environment associated with the SV-5 were assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.6.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.6.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*
- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.6.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.6.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

The mitigation measures outlined in the respective sections/reports listed above for Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF will be adhered to and implemented during Detailed Design and construction.

4.6.5.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

4.6.5.6.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area required in this section is located in the City of Markham north from the Mount Joy GO Station. Additional property requirements have been identified as part of the NT&F TPAP in order to accommodate proposed project infrastructure. The area immediately surrounding the station is *Mixed Use, Low Density Residential, Employment/Industrial and Natural Area*. Given the site's existing use as a GO station/corridor, it is consistent with existing and adjacent uses.

Lands within this segment are subject to the Mount Joy Secondary Plan. The Secondary Plan intends for the area to support mixed uses functions that integrate housing, employment, shopping and recreation opportunities at transit supportive densities adjacent to the Mount Joy GO Station. The planned infrastructure will not impact the land uses of the Secondary Plan.

Mitigation Measures

The additional OCS infrastructure area is located in an area of compatible land use with the existing land use and zoning of the property. A range of municipal permits and approvals may be required, and if so, Metrolinx will obtain all required permits and approvals. However, further coordination with the City of Markham will be undertaken during future project phases to finalize design details and minimize any conflicts on adjacent uses. Metrolinx is currently in discussions with the landowners regarding the use of this property and will reach an agreement prior to the commencement of construction activities.

4.6.5.6.2 Socio-Economic – Potential Effects and Mitigation Measures

There is one sensitive facility (community landmark) located within the vicinity of the SV-6 corridor, as seen in **Table 4-67**. The Olive Branch Community Church is located directly adjacent to the rail corridor. Recognizing that the proposed track infrastructure is already located within the existing rail right-of-way, there is no anticipated footprint impact to this sensitive facility.

TABLE 4-67: SENSITIVE FACILITIES WITHIN THE VICINITY OF THE SV-6 CORRIDOR

Corridor Segment	Type	Name	Address	Distance from 5 m OCS Impact Zone
SV-6	Community Landmark	Olive Branch Community Church	175 Anderson Avenue, Markham	10 m

The Exhibition Creek natural areas is located directly adjacent to the rail corridor. There is an anticipated footprint impact to the park as a result of the proposed infrastructure.

Other potential effects on the socio-economic environment associated with the SV-6 have been assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.6.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.6.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*
- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.6.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.6.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

Ensure that the mitigation recommendations outlined in the respective reports listed above pertaining to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF are adhered to and implemented during Detailed Design and construction.

4.6.5.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.6 Air Quality

A Regional Air Quality Study Report (refer to **Appendix F1**) details the impact assessment completed for this discipline, which is described in Section 4.8.7.2. A summary of mitigation and monitoring commitments for this section is included **Table 4-129**.

4.6.7 Noise and Vibration

The assessment of potential noise and vibration effects within this corridor is detailed in **Appendix G5**. **Appendix O5** provides maps showing the locations of receptors and recommended noise and vibration mitigation. A summary of mitigation and monitoring commitments for this section is included in **Table 4-130**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.5.

4.6.7.1 Operational Noise Assessment

The predicted Adjusted Noise Impacts for the project are summarized in **Table 4-68**, and the locations of the “segments” are presented in **Figure 3-23**.

Impact ratings for the evaluated 99 representative receptors listed in the table can be summarised as follows:

- 15 nighttime Adjusted Noise Impacts were classified as Very Significant (i.e., greater than 9.99 dB).
- 12 daytime and 21 nighttime Adjusted Noise Impacts were classified as Significant (i.e., between 5 dB and 9.99 dB).
- 5 daytime and 6 nighttime Adjusted Noise Impacts were classified as Noticeable (i.e., between 2.99 dB and 5 dB)

- 82 daytime and 57 nighttime Adjusted Noise Impacts were classified as Insignificant (i.e., less than 2.99 dB)

Mitigation measures were investigated for all receptors where the Adjusted Noise Impacts were predicted to be significant or very significant.

TABLE 4-68: SUMMARY OF ADJUSTED NOISE IMPACTS

Segment	Adjusted Impact Rating[1]	Average Objective [2]		Adjusted Noise Impact (dB)		Investigate Mitigation? [3]
		Day	Night	Day	Night	
Danforth GO to Kennedy GO	Very Significant	-	-	-	-	No
	Significant	-	50.3	-	6.7	Yes
	Noticeable	-	-	-	-	No
	Insignificant	56.4	50.0	-0.5	-1.6	No
Kennedy GO to Lawrence Ave GO	Very Significant	-	-	-	-	No
	Significant	-	50.0	-	6.8	Yes
	Noticeable	-	50.0	-	4.2	No
	Insignificant	55.0	50.0	0.3	0.3	No
Lawrence Ave GO to Agincourt GO	Very Significant	-	-	-	-	No
	Significant	55.1	50.0	6.3	7.6	Yes
	Noticeable	-	50.0	-	3.8	No
	Insignificant	55.0	50.0	-6.5	-5.4	No
Agincourt GO to Finch Ave GO	Very Significant	-	-	-	-	No
	Significant	-	50.0	-	6.2	Yes
	Noticeable	55.0	-	4.7	-	No
	Insignificant	55.0	50.0	-5.7	-4.1	No
Finch Ave Go to Milliken GO	Very Significant	-	-	-	-	No
	Significant	-	-	-	-	No
	Noticeable	-	-	-	-	No
	Insignificant	55.0	50.0	-8.3	-6.5	No
Milliken GO to Unionville GO	Very Significant	-	-	-	-	No
	Significant	-	-	-	-	No
	Noticeable	-	52.9	-	4.2	No
	Insignificant	58.2	53.5	-9.6	-9.0	No
Unionville GO to Centennial GO	Very Significant	-	-	-	-	No
	Significant	-	50.5	-	5.0	Yes
	Noticeable	-	-	-	-	No
	Insignificant	63.3	58.0	-11.8	-4.1	No
Centennial GO to Markham GO	Very Significant	-	51.7	-	10.3	Yes
	Significant	-	56.0	-	5.2	Yes
	Noticeable	-	-	-	-	No
	Insignificant	58.9	53.9	-5.9	-4.0	No
Markham GO to Mount Joy GO	Very Significant	-	-	-	-	No
	Significant	-	52.8	-	6.1	Yes
	Noticeable	-	-	-	-	No
	Insignificant	63.1	55.3	-10.0	-3.2	No

Segment	Adjusted Impact Rating[1]	Average Objective [2]		Adjusted Noise Impact (dB)		Investigate Mitigation? [3]
		Day	Night	Day	Night	
Mount Joy GO to Stouffville GO	Very Significant	-	54.8	-	15.6	Yes
	Significant	62.4	50.0	5.8	8.0	Yes
	Noticeable	61.1	-	4.5	-	No
	Insignificant	57.1	52.7	-6.7	-3.8	No
Stouffville GO to Lincolnville GO	Very Significant	-	-	-	-	No
	Significant	-	50.0	-	7.7	Yes
	Noticeable	-	50.0	-	4.6	No
	Insignificant	55.0	50.0	-6.4	-3.7	No

Notes: [1] Ratings are quantified as: Insignificant – Less than 3 dB, Noticeable – 3 dB to 4.99 dB, Significant – 5 to 9.99 dB.
[2] The objective is the higher of either the Pre-project sound level or the 55 / 50 dBA default day/night sound levels.
[3] The potential to mitigate is considered when an increase of 5 dB or greater, relative to the objective level, is predicted as per the MOEE/GO Protocol. Such an increase is considered significant (or greater). An Adjusted Noise Impact greater than 5 dB requires the investigation of mitigation

The predicted sound levels from the electric traction power facilities, were evaluated at nearby receptors and are summarized in **Table 4-69**. The predicted sound levels from the Scarborough TPS at nearby receptors were above the applicable sound level limits for nighttime. The TPF facilities study were based on assumptions regarding site configuration and equipment and therefore the resulting recommendations are broad. As such, a detailed acoustical design review is recommended at the detailed design to ensure that appropriate noise control measures to meet the NPC-300 limits have been incorporated into the final design. An updated evaluation should include more accurate sound levels and placement for transformers and, if necessary, mitigation measures such as low noise fans or barriers should be investigated for the Scarborough TPS during this stage of the design. The NPC-300 sound level limits will be met with these measures.

The predicted sound levels from the remaining electric traction power facilities at nearby receptors were below the applicable limits; therefore, no mitigation measures were investigated for these facilities.

TABLE 4-69: PREDICTED SOUND LEVELS FROM ELECTRIC TRACTION POWER FACILITIES

Receptor ID	Nearby	Evaluation Location	Period[1]	Predicted Noise Levels (dBA)	Applicable Limit (dBA)	Compliance with Performance Applicable Limit
R013	Scarborough TPS	Façade	Daytime\Evening	47	50	Yes
			Nighttime	47	45	No
		Outdoor Area	Daytime\Evening	46	50	Yes
R046	Unionville PS	Plane of Window	Daytime\Evening	26	50	Yes
			Nighttime	26	45	Yes
		Outdoor Area	Daytime\Evening	24	50	Yes
R098	Lincolnville PS	Plane of Window	Daytime\Evening	40	50	Yes
			Nighttime	40	45	Yes
		Outdoor Area	Daytime\Evening	39	50	Yes

Notes: [1] Daytime occurs from 0700-1900h. Evening occurs from 1900h-2300h. Nighttime occurs from 2300h to 0700h

The predicted sound levels from the Post-project layover sites were evaluated at nearby receptors and are summarised in **Table 4-70**. The predicted sound levels for the Post-project scenario at the Lincolnville Layover were over the applicable limit of 55 dBA. Therefore, mitigation measures were investigated for this facility.

TABLE 4-70: PREDICTED SOUND LEVELS FROM POST-PROJECT LAYOVER SITES

Receptor ID	Post-Project Layover	Evaluation Location	Period	Predicted 1-hour L_{EQ} Noise Levels (dBA)	Applicable Limit[1]	Compliance with Performance Applicable Limit
R047	Unionville Storage Yard Facility	Outdoor Area	Daytime\Evening	55	55	Yes
		Façade	Daytime\Evening \Nighttime	53	55	Yes
R099	Lincolnville Layover	Outdoor Area	Daytime\Evening	61	55	No
		Façade	Daytime\Evening \Nighttime	59	55	No

Notes: [1] The L_{EQ} is evaluated for any 1 hour period

Along the Stouffville Corridor, the investigation of mitigation was triggered along most of the study area. In total, 38 barriers were assessed for feasibility. A summary of all the barriers investigated and the results of the technical feasibility, constructability and economic feasibility studies can be found in **Table 4-71**. The noise barrier must achieve a minimum reduction of 5 dB to be considered technically feasible (from an acoustics perspective). To achieve a 5 dB reduction at receptors, a 5 m preliminary noise barrier was modelled at the ROW between the rail and receptors. If the 5 dB reduction was not achieved a 6 m then 7 m barrier was considered.

TABLE 4-71: SUMMARY OF BARRIER FEASIBILITY

Barrier	Figure[82]	Technical Feasibility (≥5 dB Reduction)	Constructability	Economic Feasibility	Overall Feasibility
Barr_Mit_01	G.1.1	Yes	Yes	No	No
Barr_Mit_02	G.1.1	Yes	No[2]	N/A	No
Barr_Mit_03	G.1.1	Yes	Yes	No	No
Barr_Mit_04	G.1.1	Yes	No[3]	N/A	No
Barr_Mit_05	G.1.1	Yes	No[3]	N/A	No
Barr_Mit_06	G.1.2	Yes	No[3]	N/A	No
Barr_Mit_07	G.1.2	Yes	No[4]	N/A	No
Barr_Mit_08	G.1.2	No	N/A	N/A	No
Barr_Mit_09	G.1.4	Yes	Yes	Yes	Yes
Barr_Mit_10	G.1.5	Yes	Yes	Yes	Yes
Barr_Mit_11	G.1.5	Yes	No[4]	N/A	No
Barr_Mit_12	G.1.5	Yes	Yes	Yes	Yes
Barr_Mit_13	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_14	G.1.6	Yes	N/A [1]	No [1]	No

[82] Figures referenced are included in **Appendix G5.**

Barrier	Figure[82]	Technical Feasibility (≥5 dB Reduction)	Constructability	Economic Feasibility	Overall Feasibility
Barr_Mit_15	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_16	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_17	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_18	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_19	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_20	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_21	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_22	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_23	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_24	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_25	G.1.6	Yes	N/A [1]	No [1]	No
Barr_Mit_26	G.1.6	Yes	Yes	Yes	Yes
Barr_Mit_27	G.1.6	Yes	Yes	Yes	Yes
Barr_Mit_28	G.1.6	Yes	Yes	Yes	Yes
Barr_Mit_29	G.1.6	Yes	Yes	Yes	Yes
Barr_Mit_30	G.1.6	Yes	Yes	Yes	Yes
Barr_Mit_31	G.1.6	Yes	Yes	No	No
Barr_Mit_32	G.1.6	Yes	Yes	No	No
Barr_Mit_33	G.1.6	Yes	Yes	No	No
Barr_Mit_34	G.1.7	Yes	No[5]	N/A	No
Barr_Mit_35	G.1.7	Yes	No[5]	N/A	No
Barr_Mit_36	G.1.7	Yes	Yes	Yes	Yes
Barr_Mit_37	G.1.7	Yes	No[5]	N/A	No
Barr_Mit_38	G.1.7	Yes	Yes	No	No
Summary					
Number of "Yes"		37	15	9	9
Number of "No"		1	9	19	29
Number of "Not Assessed"		0	14	10	-

Notes: [1] Technical feasibility check to determine if any single receptor behind a barrier gets a 5dB reduction as a result of the barrier.
[2] Barrier interferes with existing or future station.
[3] Limits of line of sight impacts to be determined in detailed design.
[4] Moving noise barrier closer to corridor would reduce MX access to its own RoW
[5] Barriers in rural areas not sent to the CEC for constructability review. Barrier deemed economically infeasible based on screening level economic feasibility calculation.

4.6.7.2 Operational Vibration Assessment

Where sensitive receptors fall within areas of influence where operational vibration levels are expected to exceed the MOEE/GO Protocol vibration limits, mitigation is recommended. Of the 16 switches included in this assessment, 4 triggered assessment of mitigation. Of the approximately 16 km of trackwork, approximately 1.6 km triggered assessment of mitigation. These results are summarized in **Table 4-72**.

Where vibration mitigation is recommended, further evaluation based on administrative, operational, economic and technical feasibility should be completed at the detailed design stage. The recommended vibration mitigation is identified as ballast mats, though consideration of other mitigation options, such as under sleeper pads or resilient fixation can be assessed at the detailed design stage.

TABLE 4-72: SUMMARY OF VIBRATION MITIGATION REQUIRED

New Infrastructure Assessed	Location	Mitigation Required[1]?	Receptors Affected
Switch	Mile 58.97	Yes	Homes along Lord Roberts Dr, and Treverton Dr.
Switch	Mile 58.92	Yes	
Switch	Mile 58.88	Yes	
Switch	Mile 58.83	Yes	Home along Treverton Dr.
Switch	Mile 45.5	Yes	Homes along Harry Blayblock Dr.
New track from Scarborough Junction to Milliken GO Station	360 m - Danforth Road to Corvette Ave	Yes	Homes along Granger Ave, Magnolia Ave, and Corvette Ave.
	290 m - Merrian Rd to Kenmark Blvd	Yes	Homes along Saugeen Cres, and Kenmark Blvd.
	640 m - Khartoum Ave to Lords Roberts Dr	Yes	Homes along Lords Roberts Dr.
	195 m - Tara Ave to Medina Cres	Yes	Homes along Medina Cres.
	55 m - Havendale Rd to Stainforth Dr	Yes	Homes along Stainforth Dr.
	70 m - Emmeline Cres to Huntingwood Dr	Yes	Homes along Emmeline Cres.

4.6.7.3 Potential Effects and Mitigation Measures

Operational Noise Assessment

Adjusted Noise Impacts were determined in accordance with the MOEE/GO Protocol and found to be significant (i.e., between 5 dB and 9.99 dB) or very significant (i.e., above 9.99dB) at a number of locations. Nine barriers (Barriers 09, 10, 12, 26, 27, 28, 29, 30, and 36) spanning a total length of approximately 3.7 km, were found to be technically and economically feasible.

For electric traction power facilities, the predicted noise levels at nearby receptors for all paralleling stations on the corridor were below the applicable sound limits. For the Scarborough traction power station (TPS) the predicted sound levels were above the applicable sound level limits for nighttime. Evaluation of more accurate sound levels for transformers and, if necessary, mitigation measures such as low noise fans or barriers should be investigated.

For layover sites, the predicted sound levels at Lincolnville Layover exceeded the limits at nearby receptors. Two barriers were investigated and found to be technically feasible. One of the two barriers was determined not be constructible by the Civil Engineer Consultant (CEC), the other was not economically feasible. Predicted sound levels for the Unionville Storage Yard Facility were predicted to be below the applicable sound level limits.

Operational Vibration Assessment

Predicted vibration effects from new switches were found to exceed the MOEE/GO Protocol limits and mitigation was recommended for 5 of the 16 new switches. Predicted vibration effects from new trackwork were found to exceed the MOEE/GO Protocol limits and mitigation was recommended for 1.6 km of 16 km of new trackwork. Of the 16 km of new trackwork considered in this assessment, 2 km are included in the New Tracks and Facilities TPAP currently seeking approval. The recommended vibration mitigation is identified as ballast mats, though other mitigation options can be considered such as under sleeper pads or resilient fixation. Further evaluation of the mitigation options based on administrative, operational, economic and technical feasibility should be completed at the detailed design stage.

4.6.8 Visual

A Visual Assessment Report (refer to **Appendix H**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-131**.

4.6.8.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.8.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.8.3 OCS: Section SV-3 – Milliken Station to Unionville Station

4.6.8.3.1 Potential Effects and Mitigation Measures

This section extends from Enterprise Drive to the south of the Highway 407 Express Toll Road, passing by the Unionville GO Station. Additional OCS infrastructure has been proposed along the Unionville GO Station. While majority of the proposed infrastructure is to occur within the existing ROW, a portion of the infrastructure may impact the existing GO Station parking lot (see **Figure 4-16**). South of the Unionville GO Station, additional OCS infrastructure is proposed to occur within the existing ROW. The surrounding area is comprised primarily of *Employment/Industrial* uses. The additional OCS infrastructure are anticipated to impact the views of the Unionville GO Station, thus visual impacts are classified as *Low* and *Moderate*.

The installation of OCS infrastructure will affect the viewshed along the rail corridors, particularly in areas of vegetation/tree clearing and at existing GO Stations. Visual impact mitigation strategies for OCS will be identified and incorporated into the detailed design process. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables (see **Appendix F** and **Appendix G5** for further details).

Mitigation measures related to the proposed OCS infrastructure are further described in **Table 4-131**.

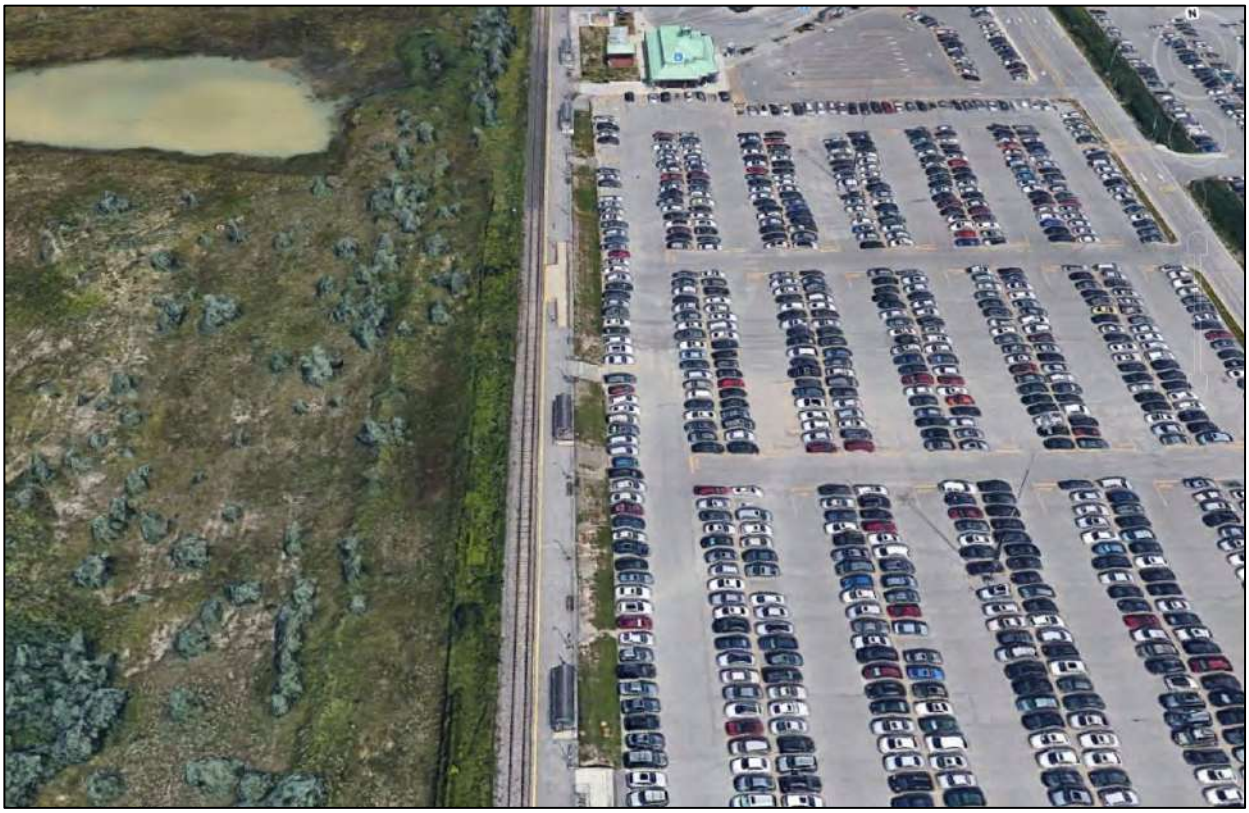

FIGURE 4-16: EXISTING UNIONVILLE GO STATION – BIRD'S EYE VIEW (LOOKING NORTH)

4.6.8.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

4.6.8.4.1 Potential Effects and Mitigation Measures

The proposed Unionville Storage Yard and associated OCS infrastructure is located north of the Unionville GO Station between Enterprise Road and Highway 7 in the City of Markham. Land uses abutting the rail corridor are mainly *Mixed Use*, *Employment* and *Natural Area*. The Unionville Storage Yard site is a single-track facility (located within the rail ROW), proposed to store trains during the day and at night, reduce congestion on the rail corridor and minimize non-revenue travel by operating in close proximity to major GO stations, including the Unionville GO Station.

The renderings in **Figure 4-17** to **Figure 4-19** conceptually depict the visual impacts of the proposed storage yard facility. For the purposes of this study, this report focuses on viewpoints from visual receptors in the neighbouring area, as discussed below.

Bill Crothers Secondary School is located on the east side of corridor, with a parking lot facing the corridor and the proposed storage yard site. Views of the proposed Unionville Storage Yard site from the second storey of the school building are anticipated to be impacted, as classrooms windows have a clear view of the corridor. Since the school building is at a considerable distance (approximately 100 metres away), views will be *Moderately* impacted. See **Figure 4-18** and **Figure 4-19** below.

Currently, the proposed Unionville Storage Yard and associated OCS infrastructure will be visible from Enterprise Boulevard, as cars approach from both the east and west. Additionally, the proposed access road to the site extends off of Enterprise Boulevard. Considering the storage yard will be built within the existing ROW, the impact to existing visual conditions are considered to be *Moderate*. See **Figure 4-19** and **Figure 4-20** below.

It is noted that the City of Markham has a nearby development, better known as Downtown Markham Master Plan. It is understood that the proposed urban centre is currently being developed to offer a mix of *Retail*, *Commercial* and *Residential* uses, while being integrated with the Rouge Valley Park. This growing community has been selected as a provincial mobility hub, seeking to seamlessly integrate this urban centre by regional rail which includes the Unionville GO Station.

Given the potential for development of the area west of the proposed Unionville Storage Yard, there may be potential for visual impacts. However, since development/construction has not begun at this location, there is an opportunity for Metrolinx to work with the developer to minimize visual impacts as much as possible.

Due to visual receptor's and the site's proximity to natural/conservation areas, Bill Crothers Secondary School, the proposed development and the Unionville Heritage Conservation District (which is located one kilometre from the site); this site is anticipated to *Moderately* impact surrounding views.

The installation of OCS infrastructure will affect the viewshed along the rail corridors, particularly in areas of vegetation/tree clearing and at existing GO Stations. Visual impact mitigation strategies for OCS will be identified and incorporated into the detailed design process. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables (see **Appendix F** and **Appendix G5** for further details).

Local municipalities and key stakeholders will be consulted during detailed design, as required. Mitigation measures related to the construction of OCS at the Unionville Storage Yard are further detailed in **Table 4-131**.

FIGURE 4-17: PROPOSED UNIONVILLE STORAGE YARD – BIRD'S EYE VIEW (LOOKING NORTHEAST)[83]

[83] Previously approved electrification infrastructure, including Tap/TPF sites and feeder routes (as applicable) are not depicted

FIGURE 4-18: EXISTING UNIONVILLE STORAGE YARD SITE – VIEW FROM SECOND STOREY SCHOOL (LOOKING WEST)

FIGURE 4-19: EXISTING UNIONVILLE STORAGE YARD SITE – EAST VIEW FROM ENTERPRISE BLVD.

4.6.8.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

4.6.8.5.1 Potential Effects and Mitigation Measures

This area includes *Industrial* development, *Recreational/Natural Spaces* as well as *Residential* development.

The proposed additional OCS infrastructure is to occur within the existing ROW. The additional OCS infrastructure area is primarily located on the east side, next to the Mount Joy Lake Park and recreational fields which is adjacent to a short stretch of single-family homes (see **Figure 4-20**). The existing station, parking lot and station platform already determine the character of this segment of the rail corridor and views of potential nearby visual receptors have already been altered. However, as the additional OCS infrastructure is close to receptors such as *Recreational* and *Residential* uses, this area is categorized as having a *Moderate* visual impact.

A Design Excellence process will be followed during detailed design to integrate new infrastructure into the existing environment and reduce the extent of visual impacts, where possible. This may be accomplished (if feasible) through visual screening measures such as fencing, use of locally-sourced or significant building materials, and/or vegetative buffers where suitable with surrounding land uses. An outdoor construction Light Pollution Plan will be developed that complies with local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting in areas near or adjacent to highways and roadways regarding outdoor lighting and incorporates industry best practices provided in ANSI/IES RP-8-18.

Local municipalities and key stakeholders will be provided with the opportunity to influence public elements of the layover facility detail design (e.g., elements such as retaining wall aesthetics, landscape architecture, application of anti-graffiti coatings, etc.) Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables (see **Appendix F** and **Appendix G5** for further details).

Mitigation measures related to the proposed platform and track infrastructure are further described in **Table 4-131**.

FIGURE 4-20: EXISTING MOUNT JOY GO STATION – BIRD'S EYE VIEW (LOOKING NORTH)

4.6.8.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

Potential visual impacts surrounding Mount GO Joy Station extend within this segment. See Section 4.6.8.5.1 above for a detailed description of potential effects and mitigation measures.

4.6.8.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.9 Utilities

A Utilities Assessment Report (refer to **Appendix I**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-132**.

4.6.9.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.9.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.9.3 OCS: Section SV-3 – Milliken Station to Unionville Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

4.6.9.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

4.6.9.4.1 Potential Effects and Mitigation Measures

The following potential underground conflict has been identified in **Table 4-73** and needs to be confirmed pending further investigations. The conflict can be mitigated by the relocation, lowering and/or casing extension of the utility.

TABLE 4-73: SECTION SV-4 - POTENTIALLY IMPACTED UTILITY

UID	Site Names	Mile Start	Mile End	Owner Name	Nearest Street	Utility Class	Description	Size	Material
51036	Stouffville	50.79	50.79	Unknown	South of Enterprise Boulevard	UG - Parallel	Culvert	500mm	Other

At this time, the assets identified in the Unionville Storage Yard development area are not anticipated to be impacted; however, reserving of the site will be required.

OCS: Section SV-5 – Markham Station to Mount Joy Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

4.6.9.5 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

4.6.9.6 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.10 EMI & EMF

An EMI & EMF Assessment Report (refer to **Appendix J**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-133**.

Throughout this corridor, as with all other corridors under study for the impact assessment, the potential effects and mitigations are identical. This is true regardless of the presence of a train storage facility in the territory.

4.6.10.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.10.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.10.3 OCS: Section SV-3 – Milliken Station to Unionville Station

4.6.10.3.1 Potential Effects and Mitigation Measures

The potential effects due to operating an electrified transit system for this segment are largely the result of overhead catenary wires to power the train, and the operation of 25kV aerial feeder lines to power the catenary. They are summarized as follows:

- EMI;
- Time-Varying EMFs;
- Induced Current in Neighbouring Metallic Wires, Fences, Pipelines, Cables, and Earth (grounding) Networks;
- Unintended Contact with High-Voltage Source; and
- ELF EMF.

The EMI would be the result of high frequency generated by the scraping of the pantograph down the catenary and the motors used to power the train. The EMFs would be the result of current flow down the catenary and within the passenger compartments of the train. The induced current would be the result of current flow down the catenary or the feeder wires. The unintended contact with the high-voltage source would be the result of access to the catenary, live wires inside the passenger compartment, or access to the feeder wires.

Mitigation for each of these potential effects has been implemented as part of the design of the system. In a general sense, for EMI, the power methodology for the Metrolinx system—auto-transformer power—has been selected specifically for its reduction of this type of interference. Additional mitigation methodologies include the following:

- Implementation and use of an EMC Control Plan.
- Proper design, e.g., grounding and shielding as per applicable Canadian electrical standards, physical separation, as identified from bench-marking similar properties across North America.
- During the electrification commissioning phase, overall ELF and RF emissions emanating from the GO electrified railway system as a whole will be field tested and verified to ensure EMFs are within the limits of applicable industry standards.
- Verify ELF EMF by measurements taken before and after project implementation.

4.6.10.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

For Unionville Storage Yard Location, refer to **Figure ST-3** in **Appendix J**.

4.6.10.4.1 Potential Effects and Mitigation Measures

Potential effects and mitigation measures associated with EMI & EMF at this location are detailed in Section 4.6.10.3.

4.6.10.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

4.6.10.5.1 Potential Effects and Mitigation Measures

Potential effects and mitigation measures associated with EMI & EMF at this location are detailed in Section 4.6.10.3.

4.6.10.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

4.6.10.6.1 Potential Effects and Mitigation Measures

Potential effects and mitigation measures associated with EMI & EMF at this location are detailed in Section 4.6.10.3.

4.6.10.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.11 Stormwater Management

A Preliminary Stormwater Management Assessment (refer to **Appendix K**) has been prepared which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-134**.

4.6.11.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.11.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.11.3 OCS: Section SV-3 – Milliken Station to Unionville Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of detailed design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

4.6.11.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed at the Unionville Storage Yard based on the preliminary analysis undertaken as part of the conceptual design work. Notwithstanding this, if environmental impacts are subsequently identified as part of Detailed Design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

For a more detailed discussion regarding anticipated Stormwater Management impacts and applicable mitigation measures at the proposed Unionville Storage Yard, please refer to the 2020 New Track & Facilities EPR. As electrification infrastructure is a component of this facility, stormwater management measures will be coordinated as part of future project phases.

4.6.11.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridor based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of detailed design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

4.6.11.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

With respect to drainage and stormwater management, quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of detailed design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

4.6.11.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.12 Groundwater and Wells

A Hydrogeological Assessment Study (refer to **Appendix L**) has been prepared which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-135**.

4.6.12.1 OCS: Section SV-1 – Scarborough Junction to Agincourt Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.12.2 OCS: Section SV-2 – Agincourt Station to Milliken Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.6.12.3 OCS: Section SV-3 – Milliken Station to Unionville Station

4.6.12.3.1 Potential Effects and Mitigation Measures

The subsurface footprint of the OCS foundation is relatively small and shallow and therefore not expected to cause any adverse groundwater impacts.

There are no anticipated footprint impacts on the proposed tracks in this segment therefore no mitigation measures have been proposed.

4.6.12.4 OCS/New Storage Facility – Unionville Storage Yard: Section SV-4 – Unionville Station to Markham Station

4.6.12.4.1 Potential Effects and Mitigation Measures

The surrounding area within 500 metres of the segment is urbanized with greenspace and the Rouge River is located approximately 400 metres northwest of the track. However, this water feature is of sufficient distance from the proposed infrastructure and is not expected to be impacted by the footprint.

The additional OCS infrastructure footprint is expected to be less than one metre in depth and therefore is not expected to cause any adverse groundwater impacts.

It is noted that review of well logs for the area indicate variable static water levels generally between 1.5 and 14 metres below grade at the time of drilling, with surficial soils generally described as being clay

and silty clay tills of low permeability. Therefore, groundwater elevations may represent perched conditions, and the need for dewatering may be limited.

As dewatering is expected to be limited and there is availability of municipal water, there is not expected to be any adverse groundwater impacts to local well users. The presence of these wells should be confirmed further prior to construction as some may no longer be in existence.

4.6.12.5 OCS: Section SV-5 – Markham Station to Mount Joy Station

4.6.12.5.1 Potential Effects and Mitigation Measures

The surrounding area within 500 metres is urbanized with two City of Markham managed SWM ponds (Mount Joy Lake) located immediately adjacent (east) of the rail ROW. The Mount Joy Creek is located along the eastern edge of the ROW. It is expected that the new OCS infrastructure footprints will be outside of the creek and SWM ponds boundaries. Surficial soils in the area are generally composed of low permeable clay and silty clay tills based on a review of well records. This suggests that the creek and SWM ponds are not likely hydraulically connected to the groundwater system.

The additional OCS infrastructure footprint is expected to be less than one (1) metre in depth and therefore is not expected to cause any adverse groundwater impacts.

Static water levels are reported in the MECP well logs as being near surface (within three-to-four metres below grade). Surficial soils in the area are generally composed of low permeable clay and silty clay tills based on review of well records. Some locations report more permeable sandy soils overlying the clay. It is likely that water levels represent perched conditions, and the need for dewatering may be limited.

The domestic wells are reported to extend to depths greater than 30 metres and therefore would not be impacted by the excavations associated with the infrastructure footprint. Due to the availability of municipal water, there is not expected to be any impacts to groundwater quantity for local well users should these wells still be in use.

4.6.12.6 OCS: Section SV-6 – Mount Joy Station to Stouffville Station

4.6.12.6.1 Potential Effects and Mitigation Measures

The surrounding area within 500 metres is urbanized with two City of Markham managed SWM ponds (Mount Joy Lake) located immediately adjacent (east) of the rail line ROW. The Mount Joy Creek is located along the eastern edge of the ROW. It is expected that the new infrastructure footprints will be outside of the creek and SWM ponds boundaries. Surficial soils in the area are generally composed of low permeable clay and silty clay tills based on a review of well records. This suggests that the creek and SWM ponds are not likely hydraulically connected to the groundwater system.

The additional OCS infrastructure footprint is expected to be less than one (1) metre in depth and therefore is not expected to cause any adverse groundwater impacts. The infrastructure may include excavations up to 10 metres in depth for pedestrian tunnels and/or elevators. Should pedestrian tunnels and/or elevators be included, additional evaluation will be required to assess the need for continued groundwater elevation management to keep tunnels and elevator shafts dry.

Static water levels are reported in the MECP well logs as being near surface (within three-to-four metres below grade). Surficial soils in the area are generally composed of low permeable clay and silty clay tills based on review of well records. Some locations report more permeable sandy soils overlying the clay. It is likely that water levels represent perched conditions, and the need for dewatering may be limited.

The domestic wells are reported to extend to depths greater than 30 metres, and therefore would not be impacted by the excavations associated with the infrastructure footprint. Due to the availability of municipal water, there is not expected to be any impacts to groundwater quantity for local well users should these wells still be in use.

4.6.12.7 OCS: Section SV-7 – Stouffville Station to Lincolnville Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7 Lakeshore East Rail Corridor

4.7.1 Natural Environment

A Natural Environment Impact Assessment Report (refer to **Appendix A**) was prepared, which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-123** and **Table 4-124**.

4.7.1.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.1.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.1.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

4.7.1.3.1 Potential Effects and Mitigation Measures

The construction footprint of the new Midland Layover facility will require vegetation removal within all areas included within this addendum study area as shown in **Appendix N, Figure LSE-18 to LSE-20**. Therefore, impacts related to vegetation removal have been addressed within the Scarborough Junction Grade Separation Natural Environment Technical Report (Stantec, 2020).

4.7.1.3.1.1 Terrestrial

4.7.1.3.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts to Transportation and Utility (CVI), Residential (CVR), Commercial and Institutional (CVC), Green Land (CGL) and Deciduous Woodland (WOD communities were previously identified due to vegetation removals within the vegetation clearing zone associated with OCS infrastructure.

Additional vegetation removal areas for Section LSE-3 associated with the additional OCS infrastructure are presented in **Table 4-74** and depicted in **Appendix A, Figures LSE-13.** The Transportation and Utility (CVI) lands that include the existing rail corridor are comprised of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due minimal canopy cover. Mitigation for CVI areas include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, vegetation removals within Commercial and Institutional (CVC) lands will be required within the vegetation clearing zone. While vegetation removals are required within these areas, they provide limited habitat for wildlife. Therefore, the removals within these areas are considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CVC communities, the extent of tree removals in these areas is minor. Mitigation for these areas include compliance with the general mitigation measures for vegetation/tree clearing identified below.

There are no vegetation removals required within City of Toronto Ravine and Natural Features Protection By-law areas (RNFP).

Details relating to impacted areas within Toronto and Region Conservation Authority (TRCA) Regulated Areas are in Section 4.7.1.3.1.4.

TABLE 4-74: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES LSE-3*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Removal Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Commercial and Institutional (CVC)	0.003	0	0.003	Minor
Transportation and Utilities (CVI)	0.0001	0	0.0001	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

Mitigation Measures

The following mitigation measures, which are common to all ELC communities, will be implemented to minimize/mitigate the potential impacts related to vegetation/tree removals:

- Vegetation management in accordance with Metrolinx's *Vegetation Guideline* (2020) will include:
    - **Detailed Tree Inventory** – All trees 10 centimetres or greater in diameter within the study area or with canopies or TPZ extending into the study area. SAR that may be directly impacted by the tree removal shall be identified during the tree inventory to the extent possible using tree inventory methods. This includes identification of tree SAR such as Butternut as well as information on the potential suitable habitat for SAR, such as the presence of bat cavity trees, where visible.
    - **Tree Protection** – Detailed measures to protect retained adjacent trees. This will include TPZ limits, diagram of tree protection barrier type, tree protection measures, and construction storage and staging areas where information is available.
    - **Vegetation Compensation** – Metrolinx has established a vegetation compensation approach for determining and implementing compensation for the removal of trees from the Metrolinx ROW as well as public and private lands. It is a landscape science-based approach designed to reflect the basic principles of the TRCA's ecosystem-based approach in addition to following the requirements of applicable bylaws. Compensation will follow one or a combination of the following approaches: ecological, baseline, or bylaw.
    - **For Trees within Metrolinx Property:** All trees within the Metrolinx ROW will be compensated for using either an ecological or baseline approach. Where tree removals are located within a designated natural area, ecological compensation will be implemented. Where removals are outside a designated natural area, a 1:1 ratio approach will be implemented (baseline compensation).
    - **For Public/Private Trees:** Compensation for trees within public and private lands, including those on the boundary between the Metrolinx ROW and public or private lands, will follow with the requirements of applicable bylaws. Trees on public or private lands that are not subject to bylaws/regulations will be compensated for following an ecological or baseline approach. Metrolinx will work directly with residents to address the loss of trees on private property.
    - **Tree End Use:** Options for the end use of trees removed from Metrolinx property (e.g. reuse/recycling options) will be developed as per the recommendations in the guideline.

- Metrolinx will make efforts to comply with the *Forestry Act* in relation to trees planted on the boundary between two lands (i.e., lands that are Metrolinx owned and lands that are not Metrolinx owned); and
- Compliance with the MBCA.

4.7.1.3.1.2 Aquatic

There are no watercourses within the additional OCS infrastructure areas, and therefore no aquatic footprint impacts.

4.7.1.3.1.3 Species at Risk

Given the low potential of occurrence of Monarch and Nine-spotted Lady Beetle, there are no anticipated footprint impacts to these species or their habitat.

Butternuts have a low potential for occurrence within the CVC communities. The presence/absence of Butternuts will be confirmed during Detailed Design. Should any Butternuts be identified, a health assessment will be required for any pure Butternuts. Dependent on the number and condition of individuals found, approval under the ESA, 2007 may include a registration and/or permitting process. Protective measures for any Butternuts within 50 metres of the construction footprint that do not need to be removed should be implemented.

The Chimney Swift has a moderate potential of occurrence in the CVC communities; however, since Chimney Swift are found within chimney structures that are part of the CVC, there are no anticipated footprint impacts to the species or its habitat.

4.7.1.3.1.4 Designated Areas

There are no footprint impacts within any Designated Areas.

4.7.1.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.1.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.1.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.1.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.1.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

4.7.1.8.1 Potential Effects and Mitigation Measures

4.7.1.8.1.1 Terrestrial

4.7.1.8.1.1.1 Impacts Related to OCS/Vegetation Clearing

Impacts resulting from vegetation removals within the vegetation clearing zone associated with OCS infrastructure were previously identified within the Natural Environmental Impact Assessment Report

prepared as part of the 2017 GO Rail Network Electrification EPR. Impacts to the following communities were identified as part of the 2017 assessment: Commercial and Institutional (CVC), Transportation and Utilities (CVI), Residential (CVR), Constructed (CV), Deciduous Thicket (THD), Cultural Meadow (CUM), Marsh (MA), Agriculture (AG), and Meadow Marsh (MAM). Additional vegetation removal areas within Section LSE-8 associated with the additional OCS infrastructure are presented in **Table 4-75** and depicted in **Appendix A, Figures LSE-39** to **LSE-40.**

The Transportation and Utility (CVI) lands that include the existing rail corridor are composed of a culturally influenced vegetation community dominated by non-native grasses and field herbs common to disturbed habitats with minimal successional trees. The footprint impacts are therefore considered negligible within the CVI lands. The extent of tree removals within the CVI is considered minor due minimal canopy cover. Mitigation for CVI areas include ensuring vegetation/tree removals follow the general mitigation measures for vegetation removal outlined below.

In addition, vegetation removals within Cultural Meadow (CUM) and Commercial and Institutional (CVC) will be required within the vegetation clearing zone. While vegetation removals are required within these areas, they provide limited habitat for wildlife. Therefore, the removals within these areas are considered to be of low impact from an ecological perspective. Due to the minimal/limited canopy cover within the CUM and CVC communities, the extent of tree removals in these areas is minor. Mitigation for these areas include compliance with the general mitigation measures for vegetation/tree clearing identified below.

Details relating to impacted areas within Central Lake Ontario Conservation Authority (CLOCA) Regulated Areas are in Section 4.7.1.8.1.4**.**

TABLE 4-75: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN ELC COMMUNITIES LSE-8*

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Removal Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Commercial and Institutional (CVC)	0.001	0	0.001	Minor
Transportation and Utilities (CVI)	0.003	0.237	0.240	Minor
Cultural Meadow (CUM)	0.897	0.537	1.434	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

Mitigation Measures

Mitigation measures related to vegetation clearing consist of vegetation management as per the Metrolinx's *Vegetation Guideline* (2020) and additional measures detailed in Section 4.7.1.3.1.1.1**.**

4.7.1.8.1.2 Aquatic

There are two watercourses within the corridor segment: Tributary of Corbett Creek (Corbett Creek West) and Corbett Creek (Corbett Creek East). No adverse effects to the Tributary of Corbett Creek or Corbett Creek are anticipated to result from the installation of OCS structures as they are located away from the watercourses. To mitigate the potential indirect impacts to the watercourses, sediment and erosion controls will be implemented, and required precautions will be taken to prevent spills and the release of hazardous materials.

4.7.1.8.1.3 Species at Risk

Butternuts have a low potential for occurrence within CVC communities. The presence/absence of Butternuts will be confirmed during detailed design. Should any Butternuts be identified, a health assessment will be required for any pure Butternuts. Dependent on the number and condition of individuals found, approval under the ESA, 2007 may include a registration and/or permitting process. Protective measures for any Butternuts within 50 metres of the construction footprint that do not need to be removed should be implemented.

Given the low potential of occurrence of Monarch, Nine-spotted Lady Beetle, and Chimney Swift, there are no anticipated footprint impacts to these species or their habitat.

4.7.1.8.1.4 Designated Areas

Footprint impacts to CVI, CVC, and CUM areas within Central Lake Ontario Conservation Authority (CLOCA) are identified in **Table 4-76**. Impacts to these vegetation communities have been discussed within Section 4.7.1.8.1.1. There are no removals required in the CVC lands outside of the Metrolinx owned ROW and only minor removals are required within the CVI and CUM lands outside of the Metrolinx ROW.

There are no footprint impacts within Corbett Creek Coastal Wetland Complex PSW.

Metrolinx has established a Vegetation Compensation framework within the ***Vegetation Guideline*** (2020) for Metrolinx undertakings and vegetation that is removed will be compensated for in accordance with the provisions of this framework.

TABLE 4-76: SUMMARY OF ADDITIONAL VEGETATION REMOVAL AREAS WITHIN DESIGNATED AREAS LSE-8*

ELC Community	Area within CLOCA Regulation Limit			Extent of Tree Removals (based on canopy cover within ELC community)
	Area within ROW (ha)	Area outside ROW (ha)	Total Removal Area within CLOCA Regulation Limit (ha)	
Commercial and Institutional (CVC)	0.001	0	0.001	Minor
Transportation and Utilities (CVI)	0.003	0.014	0.017	Minor
Cultural Meadow (CUM)	0.780	0.270	1.050	Minor

**areas are approximate for discussion purposes only and not based on surveyed data*

4.7.2 Preliminary Environmental Site Assessment

A Preliminary Environmental Site Assessment (refer to **Appendix B**) was prepared for new layover facilities. A summary of mitigation and monitoring commitments for this section is included in **Table 4-125**.

4.7.2.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.2.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.2.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

4.7.2.3.1 Potential Effects and Mitigation Measures

Based on available information and site observations, there is the potential for environmental contaminant impact to the Midland Layover from on-site and off-site historical and current land uses. A Phase II ESA is recommended at the Midland Layover to assess the quality of the soils and groundwater in accordance with the current applicable MECP Standards.

In addition, further investigation into APECs will occur as part of the geotechnical and hydrogeological investigation being undertaken as part of the Scarborough Junction Grade Separation TPAP. Pending results of these studies, requirements for the management of excess soils and dewatering activities will be confirmed and incorporated into subsequent design and construction phases as appropriate to meet regulatory requirements.

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies within corridor segments, as required. As such, no additional assessment is recommended at this time.

4.7.2.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.2.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.2.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.2.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.2.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

4.7.2.8.1 Potential Effects and Mitigation Measures

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

4.7.3 Built Heritage Resources and Cultural Heritage Landscapes

Please refer to **Appendix C1** for a description of methodology followed for assessment of Cultural Heritage impacts. Additional details can be found in the Cultural Heritage Technical Memo contained in **Appendix C1**. A summary of mitigation and monitoring commitments for this section is included in **Table 4-126**.

4.7.3.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.3.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.3.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

4.7.3.3.1 Potential Effects and Mitigation Measures

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.7.3.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.3.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.3.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.3.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.3.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

4.7.3.8.1 Potential Effects and Mitigation Measures

As no BHRs or CHLs were identified outside of what was initially assessed in the 2017 TPAP, there will be no potential effects to cultural heritage resources and associated mitigation measures are not required.

4.7.4 Archaeology

A Stage 1 Archaeological Assessment Report (refer to **Appendix D**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-127**.

4.7.4.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.4.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.4.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

4.7.4.3.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2, the area does not retain archaeological potential. No further archaeological assessment is required.

As identified in the Stage 1 AA prepared as part of the Scarborough Junction Grade Separation TPAP, the area proposed for the Midland Layover has been previously disturbed and retains no archaeological potential. No further archaeological assessment is required prior to construction.

No mitigation measures are required.

4.7.4.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.4.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.4.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.4.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.4.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

4.7.4.8.1 Potential Effects and Mitigation Measures

The Stage 1 Archaeological Assessment confirmed no potential for the disturbance of unassessed or documented archaeological resources due to deep soil disturbance events and according to the S & G Section 1.3.2, the area does not retain archaeological potential. No further archaeological assessment is required.

Refer to **Appendix D** for detailed mapping of archaeological potential at this location.

4.7.5 Land Use and Socio-Economic

A Land Use and Socio-Economic Assessment Report (refer to **Appendix E**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-128**.

4.7.5.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.5.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.5.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

4.7.5.3.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area will be located within the rail ROW in this section, though there are some areas where engineering solutions will be required to keep OCS structures within the ROW. The proposed design solutions and where they will occur will be finalized in the Detailed Design phase of the Project. There are no expected footprint effects as a result of this activity.

The proposed additional OCS infrastructure area associated with the Midland Layover is located within the City of Toronto in an area currently designated as *Utility and Transportation*. Since there are no proposed changes the existing land use designation, there are no anticipated effects associated with the proposed facility.

Mitigation Measures

No mitigation measures are required.

4.7.5.3.2 Socio-Economic – Potential Effects and Mitigation Measures

There are no sensitive facilities adjacent to the additional OCS infrastructure area, and therefore there are no effects anticipated.

McCowan District Park is located adjacent to the rail corridor to the west of McCowan Road, and will not be adversely impacted by the additional OCS infrastructure.

There are no anticipated adverse effects on these recreational amenities due to the implementation of electrification infrastructure identified as part of the conceptual design developed for the Significant Addendum to the Electrification TPAP. Notwithstanding this, potential conflicts with recreational amenities will be reviewed during future project phases, and if required the City of Toronto will be consulted to determine appropriate solutions to mitigate/minimize potential effects to recreational amenities.

Other potential effects on the socio-economic environment associated with the LSE-3 were assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.7.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.7.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*
- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.7.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.7.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

Ensure that the mitigation recommendations outlined in the respective reports listed above pertaining to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF are adhered to and implemented during Detailed Design and construction.

4.7.5.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.5.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.5.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.5.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.5.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

4.7.5.8.1 Land Use – Potential Effects and Mitigation Measures

The additional OCS infrastructure area required in this section is located in the Town of Whitby and the City of Oshawa west of the Oshawa GO Station. Additional property requirements have been identified as part of the NT&F TPAP, including the Thickson Road Bridge Expansion in order to accommodate proposed project infrastructure. The area immediately surrounding the station is *Employment/Industrial and Utilities/Transportation* (including Metrolinx's Whitby Rail Maintenance Facility). Given the site's existing Utilities/Transportation usage, the Project is consistent with existing and adjacent uses.

Mitigation Measures

The additional OCS infrastructure area is located in an area of compatible land use with the existing land use and zoning of the property. Although Metrolinx as a Provincial Agency is not subject to municipal permits and approvals, our policy is to adhere to the intent of the relevant permits/approvals requirements to the greatest extent possible. However, further coordination (which may include a series of meetings, discussions, and agreements) with the Town of Whitby/City of Oshawa will be undertaken during future project phases to finalize design details and minimize any conflicts on adjacent uses. Metrolinx is currently in discussions with the landowners regarding the use of this property and will reach an agreement prior to the commencement of construction activities.

4.7.5.8.2 Socio-Economic – Potential Effects and Mitigation Measures

There are no sensitive facilities adjacent to the additional OCS infrastructure area, and therefore there are no effects anticipated.

The Town of Whitby has a planned cycling route which is scheduled to pass under the rail corridor at the Thickson Road. There are no anticipated impacts to the cycling route.

Other potential effects on the socio-economic environment associated with the LSE-8 have been assessed through other studies as part of the EPR Addendum as follows:

- Air Quality – see *GO Rail Network Electrification* EPR Addendum Section 4.7.6 as well as the Air Quality Assessment Report contained in **Appendix F** *of the EPR Addendum;*
- Noise and Vibration – see *GO Rail Network Electrification* EPR Addendum Section 4.7.7 as well as the Noise and Vibration Assessment Report contained in **Appendix G** *of the EPR Addendum;*

- Visual/Aesthetics – see *GO Rail Network Electrification* EPR Addendum Section 4.7.8 as well as the Visual Assessment Report contained in **Appendix H** *of the EPR Addendum; and*
- EMI/EMF – see *GO Rail Network Electrification* EPR Addendum Section 4.7.10 as well as the EMI/EMF Assessment Report contained in **Appendix J** *of the EPR Addendum.*

In order to avoid repeating the effects and mitigation measures as they pertain to these studies, and for further detail, please refer to the respective sections/reports outlined above.

Mitigation Measures

Ensure that the mitigation recommendations outlined in the respective reports listed above pertaining to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF are adhered to and implemented during Detailed Design and construction.

4.7.6 Air Quality

The assessment of potential air quality effects within this corridor is detailed in **Appendix F4**. A summary of mitigation and monitoring commitments for this section is included **Table 4-129**.

LSE Study Area was arbitrarily divided into four study segments. Segment 1 begins west of the Don River (in Toronto, east of Union Station) and ends east of the proposed Midland layover, approximately 13.7 km in length. Segment 2 begins adjacent to Segment 1 (east of the Midland layover), and ends at Manse Road in Toronto, approximately 6.5 km in length. Segment 3 begins west of Rouge Hill GO Station and continues to Pickering GO Station, approximately 9 km in length. Segment 4 begins west of Ajax GO Station and ends east of the Whitby Rail Maintenance Facility, approximately 12.1 km in length. These four segments encompass the areas that have significant amounts of residential use in proximity to the rail corridor (within 150m of it). A such, they cover the areas of worst-case potential impact. The lateral extent of the study area was 500m around stations and layovers, and 300m on either side of the tracks away from stations and layovers.

4.7.6.1 Segment 1

The highest predicted cumulative concentrations at the worst-case receptor in Segment 1, under worst-case meteorological and background air quality conditions are summarized in **Table 4-77** (Baseline Scenario) and **Table 4-78** (Future Scenario).

Some of the contaminants are predicted to exceed standards or criteria at the worst-case receptor, as follows:

- 1-hour and 24-hour NO_2 concentrations meet the current Ontario AAQC's, but 1-hour and annual average NO_2 do not meet the more recent and more stringent Canadian Ambient Air Quality Standards (CAAQS) in either the Baseline or Future Scenario.
- 24-hour and annual average Benzo(a)pyrene exceed the provincial AAQCs in both scenarios.
- 24-hour Benzene meets the AAQC in both scenarios, but the annual average Benzene does not in either scenario.

$PM_{2.5}$, Acrolein, Carbon Monoxide, Formaldehyde, Acetaldehyde, and 1,3-Butadiene are all predicted to be within their objectives in both the Baseline and Future Scenario. As mentioned previously, the AAQCs and CAAQS represent desirable levels, rather than statutory limits. Measures mandated to achieve the CAAQS should consider technical achievability, practicality and implementation costs (CCME, 2019).

Figure 4-21 shows where the worst-case receptors are located for the contaminants that exceed an AAQC or CAAQS. In the case of NO_2, they are located adjacent to the rail corridor. For Benzene and Benzo(a)pyrene, they are located adjacent to the Scarborough Station parking lot.

Predicted concentrations of Benzene, Benzo(a)pyrene, and NO_2 are significantly lower at other receptor locations besides their respective worst-case receptors. The following paragraphs provide more detail on predicted concentrations of NO_2, Benzene and Benzo(a)pyrene, all of which are predicted to exceed one or more AAQC or CAAQS at the worst-case receptor(s).

Benzene and Benzo(a)pyrene in Segment 1

Table 4-79 and **Table 4-80** show that results for Benzene and Benzo(a)pyrene at the worst-case receptor location are lower in the Future Scenario than in the Baseline Scenario. The worst-case receptor is adjacent to the parking lot of the Scarborough Station. At this location, the predicted Benzene and Benzo(a)pyrene concentrations are influenced significantly by emissions from vehicles operating in the parking lot. The reduced concentrations in the Future Scenario are due to future reductions in tailpipe emissions from on-road vehicles, as older vehicles in the fleet gradually get replaced by newer, lower-emission vehicles.

Table 4-79 and **Table 4-80** present results for a selection of four other receptors besides the worst-case receptor. The four receptors cover a range of distances away from the rail corridor. Figure 13 shows their locations. At these locations, the predicted cumulative concentrations of Benzene and Benzo(a)pyrene are higher in the Future Scenario than in the Baseline Scenario, but the contribution of Metrolinx-related emissions to the cumulative concentrations is small (less than 15%), and the change in concentration between scenarios is also small. While the predicted average cumulative concentrations exceed the AAQCs at all receptors, It is attributable mainly to background levels of these contaminants and is largely unrelated to Metrolinx-related emissions in either the Baseline or Future Scenario.

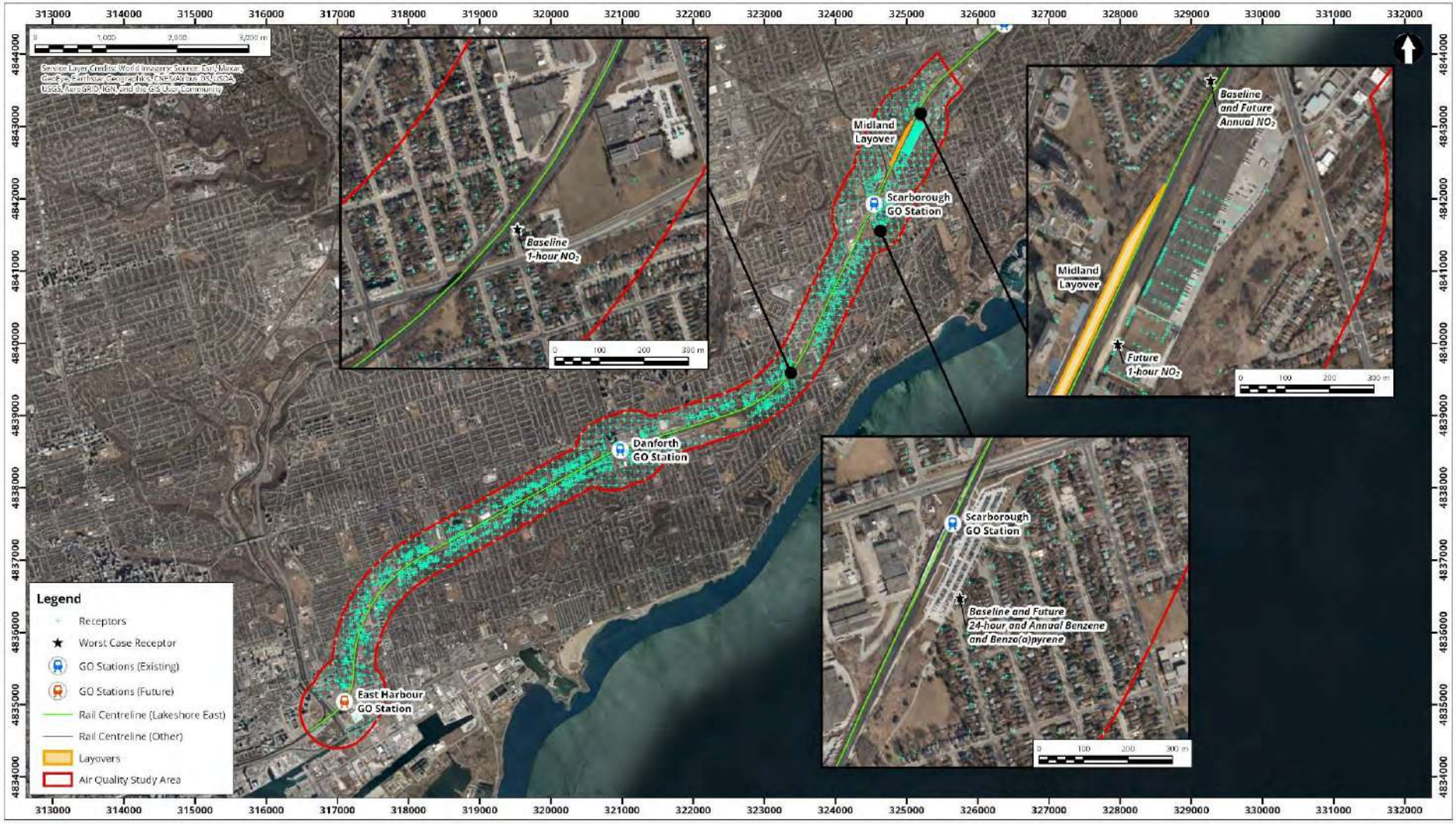

FIGURE 4-21: LOCATION OF WORST-CASE AIR QUALITY RECEPTORS IN SEGMENT 1 FOR BASELINE AND FUTURE BENZO(A)PYRENE, BENZENE, AND NO_2

TABLE 4-77: MAXIMUM MODELLED CONCENTRATIONS AT WORST-CASE AIR QUALITY RECEPTOR LOCATION IN SEGMENT 1 FOR BASELINE (2015) SCENARIO

Pollutant	Averaging Time	All Modelled Sources (µg/m³)	Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criteria
AAQC					
NO_2	1 hour	103	142	400	36%
	24 hours	39	86	200	43%
Acrolein	1 hour	0.25	0.36	4.50	8%
	24 hours	0.078	0.14	0.4	36%
CO	1 hour	521	740	36200	2%
	8-hr	228	1417	15700	9%
PM_{10}	24 hours	1.6	28	50	56%
Benzene	24 hours	1.1	1.9	2.3	83%
	Annual	0.31	0.83	0.45	185%
B(a)pyrene	24 hours	2.8E-04	3.7E-04	5.0E-05	733%
	Annual	7.8E-05	1.3E-04	1.0E-05	1260%
Formaldehyde	24 hours	1.0	4.5	65	7%
Acetaldehyde	24 hours	0.39	2.1	500	0.4%
1,3-Butadiene	24 hours	0.15	0.22	10	2.2%
	Annual	0.042	0.081	2	4%
CAAQS					
NO_2	1 hour (2020)	96	135	119	114%
	1 hour (2025)	96	135	83	163%
	Annual (2020)	14	36	34	108%
	Annual (2025)	14	36	24	153%
$PM_{2.5}$	24 hours	1.0	16	27	61%
	Annual	0.5	8.3	8.8	94%

[1] Background levels based on difference between receptor concentration with and without background concentrations in model
[2] Results averaged based on CAAQS averaging periods described in Table 1 above

TABLE 4-78: MAXIMUM MODELLED CONCENTRATIONS AT WORST-CASE AIR QUALITY RECEPTOR LOCATION IN SEGMENT 1 FOR FUTURE SCENARIO

Pollutant	Averaging Time	All Modelled Sources (µg/m³)	Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criteria
AAQC					
NO_2	1 hour	143	173	400	43%
	24 hours	48	95	200	47%
Acrolein	1 hour	1.3	1.42	4.50	32%
	24 hours	0.2	0.26	0.4	66%
CO	1 hour	329	548	36200	1.5%
	8-hr	140	1329	15700	8.5%
PM_{10}	24 hours	2.8	29	50	59%
Benzene	24 hours	0.7	1.5	2.3	65%
	Annual	0.2	0.72	0.45	160%
B(a)pyrene	24 hours	1.3E-04	2.1E-04	5.0E-05	427%
	Annual	3.6E-05	8.4E-05	1.0E-05	842%
Formaldehyde	24 hours	2.7	6.2	65	9.5%
Acetaldehyde	24 hours	0.96	2.7	500	0.5%
1,3-Butadiene	24 hours	0.1	0.16	10	1.6%
	Annual	0.027	0.066	2	3.3%
CAAQS					
NO_2	1 hour (2020)	137	167	119	141%
	1 hour (2025)	137	167	83	201%
	Annual (2020)	22	44	34	131%
	Annual (2025)	22	44	24	186%
$PM_{2.5}$	24 hours	2	17	27	64%
	Annual	0.8	8.6	8.8	98%

[1] Background levels based on difference between receptor concentration with and without background concentrations in model
[2] Results averaged based on CAAQS averaging periods described in Table 1 above

TABLE 4-79: AVERAGE BENZENE CONCENTRATIONS AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 1

Scenario	Height above Grade (m)	Receptor	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)		
				Metrolinx-related Sources	Background	Total
Baseline	1.5	1	22	0.05	0.52	0.57
	1.5	2	315	0.01	0.52	0.53
	1.5	3	200	0.01	0.52	0.53
	1.5	4	115	0.01	0.52	0.53
Future	1.5	1	22	0.09	0.52	0.61
	1.5	2	315	0.02	0.52	0.54
	1.5	3	200	0.02	0.52	0.54
	1.5	4	115	0.02	0.52	0.54
Ontario AAQC				**0.45 (annual mean)**		

TABLE 4-80: AVERAGE BENZO(A)PYRENE CONCENTRATIONS AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 1

Scenario	Height above Grade (m)	Receptor	Distance from Tracks (m)	Annual Average Concentration (ng/m^3)		
				Metrolinx-related Sources	Background	Total
Baseline	1.5	1	22	0.003	0.048	0.051
	1.5	2	315	0.001	0.048	0.049
	1.5	3	200	0.002	0.048	0.050
	1.5	4	115	0.001	0.048	0.049
Future	1.5	1	22	0.005	0.048	0.053
	1.5	2	315	0.001	0.048	0.049
	1.5	3	200	0.001	0.048	0.049
	1.5	4	115	0.001	0.048	0.049
Ontario AAQC				**0.01 (annual mean)**		

NO_2 in Segment 1

Like Benzene and Benzo(a)pyrene, concentrations of NO_2 are significantly lower at other receptor locations besides the worst-case receptor. In the Baseline Scenario, the predicted concentrations meet the 2020 CAAQS beyond approximately 30m from the rail corridor. In the Future Scenario, the predicted worst-case concentrations are higher. The future daily maximum 1-hour concentrations meet the 2020 CAAQS beyond approximately 300m, and the future annual average concentrations meet the 2020 CAAQS beyond approximately 100m from the rail corridor.

Table 4-81 shows the range of predicted cumulative 1-hour concentrations of NO_2 at the four selected receptors. The maximum/minimum concentrations shown in the table are

maximum/minimum values over the 5 year period of the simulation. Similarly, mean values are 5-year mean values. All values in the table include hourly 90th percentile background concentrations.

The table shows that concentrations are higher in the Future Scenario than in the Baseline Scenario at all four receptors, particularly with respect to the maximum hourly concentrations. The mean and median hourly concentrations are only modestly higher in the Future Scenario. **Table 4-81** also shows that, while the maximum concentrations exceed the CAAQS concentration levels, the median values are well below both the 2020 and the 2025 CAAQS levels. Thus, the predicted concentrations are below the desired limits most of the time.

TABLE 4-81: RANGE OF PREDICTED CUMULATIVE 1-HR NO2 CONCENTRATIONS AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 1

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	Hourly Concentration (µg/m^3)			
				Maximum	Mean	Median	Minimum
Baseline	1	1.5	22	142	60	56	29
	2	1.5	315	86	48	53	29
	3	1.5	200	81	48	53	29
	4	1.5	115	97	49	53	29
Future	1	1.5	22	158	68	60	29
	2	1.5	315	136	50	53	29
	3	1.5	200	108	50	53	29
	4	1.5	115	126	50	53	29
Ontario AAQC				**400 (1-hr), 200 (24-hr)**			
2020 CAAQS				**119 (98th percentile daily max 1-hr)**			
2025 CAAQS				**83 (98th percentile daily max 1-hr)**			

Table 4-82 shows the contributions of Metrolinx-related emissions and background emissions to the cumulative average NO_2 concentrations at the four representative receptors. At Receptor 1, which is only 22m away from the tracks, the contribution of Metrolinx-related emissions is 38% of the total in the Baseline Scenario and 50% of the total in the Future Scenario. At all other of the representative receptors, which are beyond 100m from the tracks, the Metrolinx contribution is less than 15% in both scenarios. Thus, the contribution of Metrolinx-related emissions is generally small beyond about 100m from the tracks. The average cumulative concentrations meet the 2020 CAAQS at three of the four receptors, with Receptor 1 being the exception. They do not meet the 2025 CAAQS, mainly due to background concentrations which, on their own, are only slightly below the 2025 CAAQs level

TABLE 4-82: SOURCE CONTRIBUTIONS TO AVERAGE NO2 AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 1

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)		
				Metrolinx-related Sources	Background	Total
Baseline	1	1.5	22	14	22	36
	2	1.5	315	1	22	24
	3	1.5	200	2	22	24
	4	1.5	115	2	22	25
Future	1	1.5	22	21	22	44
	2	1.5	315	3	22	26
	3	1.5	200	3	22	26
	4	1.5	115	4	22	26
2020 CAAQS				**34 (Annual Average)**		
2025 CAAQS				**24 (Annual Average)**		

4.7.6.2 Segment 2

The results for Segment 2 are very similar to those for Segment 1. Predicted concentrations at the worst-case receptor, under worst-case meteorological conditions and worst-case background air quality conditions are shown in **Table 4-83** (Baseline Scenario) and **Table 4-84** (Future Scenario). Like Segment 1, the predicted concentrations are within the provincial ambient air quality criteria (AAQCs) and national standards (CAAQS) for all contaminants and averaging periods, except the following:

- Annual average benzene in both scenarios;
- Maximum 24-hour and annual average benzo(a)pyrene in both scenarios;
- 98th percentile daily maximum 1-hour and annual average NO_2 in both scenarios.

Figure 4-22 shows the location(s) of the worst-case receptor for each of these contaminants and averaging periods. The locations are very similar to those for Segment 1 (adjacent to a station parking lot in the case of benzene and benzo(a)pyrene, and adjacent to the rail corridor in the case of NO_2). **Table 4-85** through **Table 4-88** show similar information for the selected receptors to that which was shown for Segment 1.

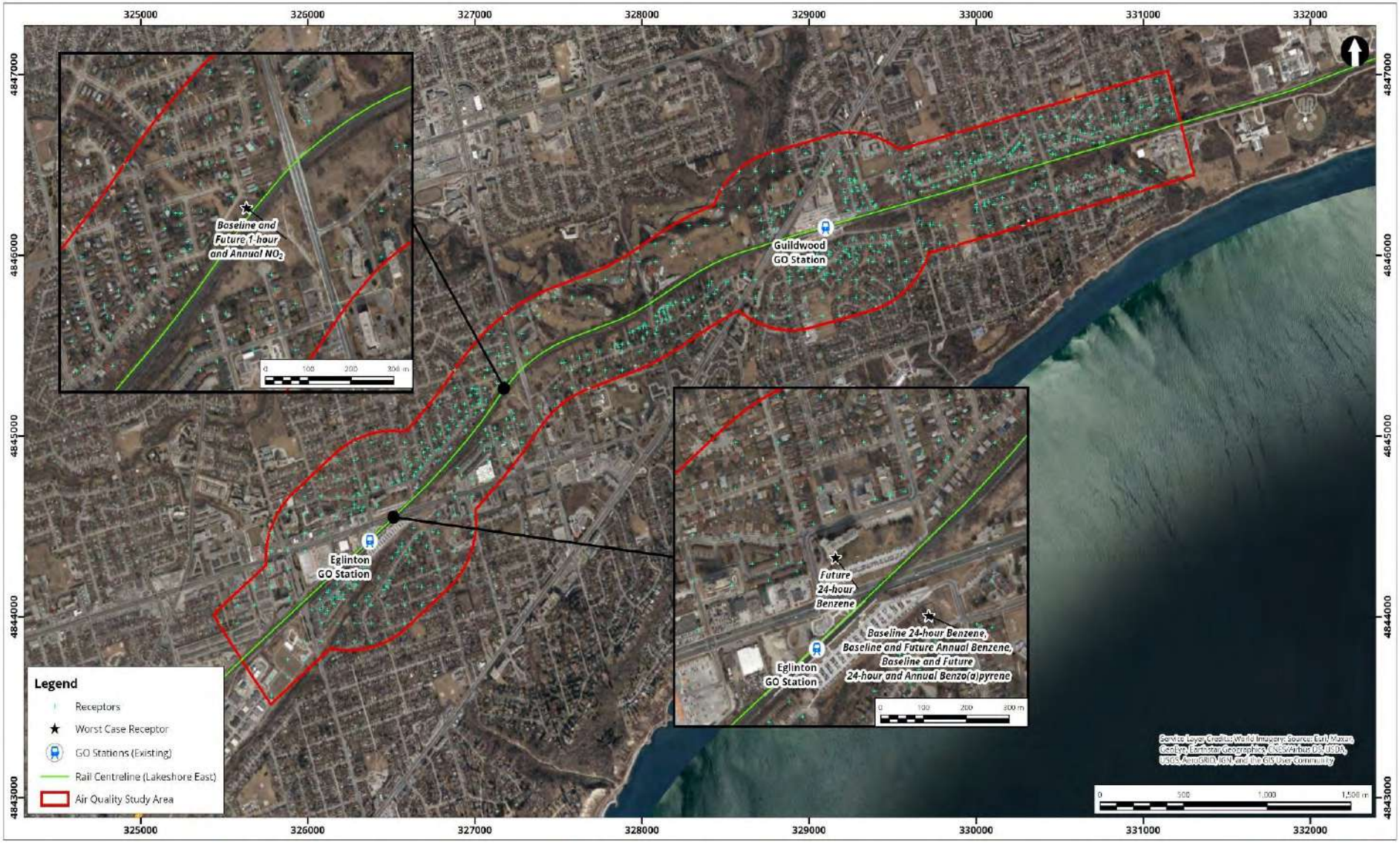

FIGURE 4-22: LOCATION OF WORST-CASE AIR QUALITY RECEPTORS IN SEGMENT 2 FOR BASELINE AND FUTURE BENZO(A)PYRENE, BENZENE, AND NO2

TABLE 4-83: MAXIMUM MODELLED CONCENTRATIONS AT WORST-CASE AIR QUALITY RECEPTOR LOCATION IIN SEGMENT 2 FOR BASELINE (2015) SCENARIO

Pollutant	Averaging Time	All Modelled Sources (µg/m³)	Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criteria
AAQC					
NO_2	1 hour	106	145	400	36%
	24 hours	41	88	200	44%
Acrolein	1 hour	0.28	0.39	4.50	9%
	24 hours	0.08	0.15	0.4	38%
CO	1 hour	301	520	36200	1.4%
	8-hr	212	1401	15700	8.9%
PM_{10}	24 hours	1.7	28	50	56%
Benzene	24 hours	0.78	1.6	2.3	69%
	Annual	0.16	0.69	0.45	153%
B(a)pyrene	24 hours	2.0E-04	2.8E-04	5.0E-05	563%
	Annual	4.1E-05	8.9E-05	1.0E-05	886%
Formaldehyde	24 hours	1.1	4.6	65	7.1%
Acetaldehyde	24 hours	0.39	2.1	500	0.4%
1,3-Butadiene	24 hours	0.11	0.17	10	1.7%
	Annual	0.022	0.061	2	3.0%
CAAQS					
NO_2	1 hour (2020)	103	142	119	120%
	1 hour (2025)	103	142	83	171%
	Annual (2020)	16	38	34	113%
	Annual (2025)	16	38	24	161%
$PM_{2.5}$	24 hours	1.1	17	27	61%
	Annual	0.5	8.3	8.8	95%

[1] Background levels based on difference between receptor concentration with and without background concentrations in model
[2] Results averaged based on CAAQS averaging periods described in Table 1 above

TABLE 4-84: MAXIMUM MODELLED CONCENTRATIONS AT WORST-CASE AIR QUALITY RECEPTOR LOCATION IN SEGMENT 2 FOR FUTURE SCENARIO

Pollutant	Averaging Time	All Modelled Sources (µg/m³)	Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criteria
AAQC					
NO_2	1 hour	116	155	400	39%
	24 hours	49	96	200	48%
Acrolein	1 hour	0.47	0.59	4.5	13%
	24 hours	0.13	0.20	0.4	49%
CO	1 hour	267	485	36200	1.3%
	8-hr	145	1334	15700	8.5%
PM_{10}	24 hours	2.6	29	50	58%
Benzene	24 hours	0.5	1.3	2.3	57%
	Annual	0.11	0.63	0.45	140%
B(a)pyrene	24 hours	9.4E-05	1.8E-04	5.0E-05	352%
	Annual	1.9E-05	6.7E-05	1.0E-05	671%
Formaldehyde	24 hours	1.7	5.2	65	8.0%
Acetaldehyde	24 hours	0.60	2.4	500	0.5%
1,3-Butadiene	24 hours	0.07	0.14	10	1.4%
	Annual	0.014	0.053	2	2.7%
CAAQS					
NO_2	1 hour (2020)	112	150	119	127%
	1 hour (2025)	112	150	83	181%
	Annual (2020)	22	44	34	132%
	Annual (2025)	22	44	24	186%
$PM_{2.5}$	24 hours	1.7	17	27	64%
	Annual	0.8	8.6	8.8	98%

[1] Background levels based on difference between receptor concentration with and without background concentrations in model
[2] Results averaged based on CAAQS averaging periods described in Table 1 above

TABLE 4-85: RANGE OF PREDICTED CUMULATIVE 1-HR NO2 CONCENTRATIONS AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 2

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	Hourly Concentration (µg/m^3)			
				Maximum	Mean	Median	Minimum
Baseline	5	1.5	19	147	62	58	29
	6	1.5	95	110	51	53	29
	7	1.5	317	82	48	53	29
	8	1.5	231	88	48	53	29
Future	5	1.5	19	157	68	60	29
	6	1.5	95	127	53	54	29
	7	1.5	317	102	49	53	29
	8	1.5	231	114	49	53	29
Ontario AAQC				**400 (1-hr), 200 (24-hr)**			
2020 CAAQS				**119 (98th percentile daily max 1-hr)**			
2025 CAAQS				**83 (98th percentile daily max 1-hr)**			

TABLE 4-86: AVERAGE SOURCE CONTRIBUTIONS TO NO2 AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 2

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)		
				Metrolinx-related Sources	Background	Total
Baseline	5	1.5	19	15.4	22.5	38
	6	1.5	95	4.1	22.5	27
	7	1.5	317	1.7	22.5	24
	8	1.5	231	1.7	22.5	24
Future	5	1.5	19	21.4	22.5	44
	6	1.5	95	5.9	22.5	28
	7	1.5	317	2.4	22.5	25
	8	1.5	231	2.4	22.5	25
2020 CAAQS				**34 (Annual Average)**		
2025 CAAQS				**24 (Annual Average)**		

TABLE 4-87: AVERAGE SOURCE CONTRIBUTIONS TO BENZENE AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 2

Scenario	Height above Grade (m)	Receptor	Distance from Tracks (m)	Annual Average Concentration (µg/m^3)		
				Metrolinx-related Sources	Background	Total
Baseline	1.5	5	19	0.06	0.52	0.58
	1.5	6	95	0.03	0.52	0.55
	1.5	7	317	0.02	0.52	0.54
	1.5	8	231	0.01	0.52	0.53
Future	1.5	5	19	0.09	0.52	0.61
	1.5	6	95	0.03	0.52	0.55
	1.5	7	317	0.02	0.52	0.54
	1.5	8	231	0.01	0.52	0.53
Ontario AAQC				**0.45 (annual mean)**		

TABLE 4-88: AVERAGE SOURCE CONTRIBUTIONS TO BENZO(A)PYRENE AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 2

Scenario	Height above Grade (m)	Receptor	Distance from Tracks (m)	Annual Average Concentration (ng/m^3)		
				Metrolinx-related Sources	Background	Total
Baseline	1.5	5	19	0.004	0.048	0.052
	1.5	6	95	0.004	0.048	0.052
	1.5	7	317	0.003	0.048	0.051
	1.5	8	231	0.001	0.048	0.049
Future	1.5	5	19	0.005	0.048	0.053
	1.5	6	95	0.003	0.048	0.051
	1.5	7	317	0.002	0.048	0.050
	1.5	8	231	0.001	0.048	0.049
Ontario AAQC				0.01 (annual mean)		

4.7.6.3 Segment 3

The results for Segment 3 are very similar to those for Segment 1 and Segment 2, but with predicted concentrations in a portion of Segment 3 being influenced by the presence of Highway 401 adjacent to the corridor. Predicted concentrations at the worst-case receptor, under worst-case meteorological conditions and worst-case background air quality conditions are shown in **Table 4-89** (Baseline Scenario) and **Table 4-90** (Future Scenario). The predicted concentrations are within the provincial ambient air quality criteria (AAQCs) and national standards (CAAQS) for all contaminants and averaging periods, except the following:

- Maximum 24-hour and annual average benzene in both scenarios;
- Maximum 24-hour and annual average benzo(a)pyrene in both scenarios;
- 98th percentile daily maximum 1-hour and annual average NO_2 in both scenarios;
- Annual average $PM_{2.5}$ in both scenarios.

Figure 4-23 shows the location(s) of the worst-case receptor for each of these contaminants and averaging periods. For $PM_{2.5}$, NO_2 and benzo(a)pyrene, the worst-case receptors are located adjacent to Highway 401. For benzene, it is located adjacent to a station parking lot (Rouge Hill Station). For all contaminants, the predicted worst-case concentrations are significantly influenced by on-road vehicle emissions (either Highway 401 or a station parking lot). The concentrations decrease significantly between the Baseline and Future Scenario. The decreases are due to the ongoing effect of federal vehicle emission regulations for on-road vehicles. They are unrelated to the project. However, the project's contribution is sufficiently small not to reverse the trend in Segment 3 of the study area.

Figure 4-24 shows locations of selected receptors in Segment 3 that were examined in greater detail. **Table 4-91** through **Table 4-95** show information for the selected receptors, similar to what was shown previously for Segments 1 and 2.

While the predicted hourly cumulative NO_2 concentrations exceed the CAAQS levels at the prescribed frequency (98th percentile of daily maximum 1-hour concentration), they nevertheless meet the CAAQS levels most of the time (more than 80% at all four selected receptors). The predicted annual average NO_2 concentrations exceed the CAAQS levels, with the principal cause being background concentrations and the contribution from Highway 401. The contribution from Metrolinx-related sources to annual average NO_2 at the selected receptors is small.

Similarly, the contribution from Metrolinx-related sources to annual average $PM_{2.5}$, Benzene and Benzo(a)pyrene is small, with the background sources and Highway 401 being the principal causes of levels above the CAAQS and AAQCs.

FIGURE 4-23: LOCATION OF WORST-CASE AIR QUALITY RECEPTORS IN SEGMENT 3 FOR BASELINE AND FUTURE BENZO(A)PYRENE, BENZENE, NO2, AND PM2.5

FIGURE 4-24: LOCATIONS OF SELECTED REPRESENTATIVE AIR QUALITY RECEPTORS IN SEGMENT 3

TABLE 4-89: MAXIMUM MODELLED CONCENTRATIONS AT WORST-CASE AIR QUALITY RECEPTOR LOCATION IN SEGMENT 3 FOR BASELINE (2015) SCENARIO

Pollutant	Averaging Time	All Modelled Sources (µg/m³)	Highway 401 (µg/m³)	Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criteria
AAQC						
NO_2	1 hour	237	233	294	400	73%
	24 hours	106	103	152	200	76%
Acrolein	1 hour	0.60	0.52	0.72	4.50	16%
	24 hours	0.13	0.10	0.19	0.4	49%
CO	1 hour	2222	2195	2441	36200	6.7%
	8-hr	687	649	1876	15700	12%
PM_{10}	24 hours	19	19	45	50	91%
Benzene	24 hours	1.9	0.72	2.7	2.3	119%
	Annual	0.54	0.18	1.06	0.45	236%
B(a)pyrene	24 hours	2.0E-03	1.9E-03	2.1E-03	5.0E-05	4166%
	Annual	4.8E-04	4.8E-04	5.3E-04	1.0E-05	5304%
Formaldehyde	24 hours	1.7	1.3	5.2	65	7.9%
Acetaldehyde	24 hours	0.88	0.66	2.6	500	0.5%
1,3-Butadiene	24 hours	0.27	0.10	0.34	10	3.4%
	Annual	0.075	0.025	0.114	2	5.7%
CAAQS						
NO_2	1 hour (2020)	171	168	219	119	184%
	1 hour (2025)	171	168	219	83	263%
	Annual (2020)	43	41	66	34	195%
	Annual (2025)	43	41	66	24	276%
$PM_{2.5}$	24 hours	10	10	26	27	95%
	Annual	3.5	3.5	11	8.8	129%

[1] Background levels based on difference between receptor concentration with and without background concentrations in model
[2] Results averaged based on CAAQS averaging periods described in Table 1 above

TABLE 4-90: MAXIMUM MODELLED CONCENTRATIONS AT WORST-CASE AIR QUALITY RECEPTOR LOCATION IN SEGMENT 3 FOR FUTURE SCENARIO

Pollutant	Averaging Time	All Modelled Sources (µg/m³)	Highway 401 (µg/m³)	Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criteria
AAQC						
NO_2	1 hour	155	143	194	400	48%
	24 hours	79	72	125	200	63%
Acrolein	1 hour	0.43	0.23	0.54	4.50	12%
	24 hours	0.10	0.045	0.16	0.4	41%
CO	1 hour	1090	1046	1309	36200	3.6%
	8-hr	360	317	1549	15700	10%
PM_{10}	24 hours	10	9.4	37	50	73%
Benzene	24 hours	1.2	0.22	2.0	2.3	88%
	Annual	0.33	0.056	0.85	0.45	189%
B(a)pyrene	24 hours	6.6E-04	6.2E-04	7.4E-04	5.0E-05	1474%
	Annual	1.6E-04	1.5E-04	2.1E-04	1.0E-05	2056%
Formaldehyde	24 hours	1.3	0.63	4.8	65	7.4%
Acetaldehyde	24 hours	0.51	0.27	2.3	500	0.5%
1,3-Butadiene	24 hours	0.18	0.021	0.25	10	2.5%
	Annual	0.047	0.0053	0.086	2	4.3%
CAAQS						
NO_2	1 hour (2020)	128	113	167	119	140%
	1 hour (2025)	128	113	167	83	201%
	Annual (2020)	29	25	51	34	152%
	Annual (2025)	29	25	51	24	216%
$PM_{2.5}$	24 hours	4.5	3.9	20	27	74%
	Annual	1.6	1.3	9	8.8	106%

[1] Background levels based on difference between receptor concentration with and without background concentrations in model
[2] Results averaged based on CAAQS averaging periods described in Table 1 above

TABLE 4-91: RANGE OF PREDICTED CUMULATIVE 1-HR NO2 CONCENTRATIONS AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 3

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	Hourly Concentration (µg/m^3)			
				Maximum	Mean	Median	Minimum
Baseline	9	1.5	196	253	89	65	29
	10	1.5	103	198	78	66	29
	11	1.5	206	236	83	62	29
	12	1.5	280	163	65	57	29
Future	9	1.5	196	173	74	61	29
	10	1.5	103	163	66	59	29
	11	1.5	206	172	69	60	29
	12	1.5	280	146	57	55	29
Ontario AAQC				**400 (1-hr), 200 (24-hr)**			
2020 CAAQS				**119 (98th percentile daily max 1-hr)**			
2025 CAAQS				**83 (98th percentile daily max 1-hr)**			

TABLE 4-92: AVERAGE SOURCE CONTRIBUTIONS TO NO2 AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 3

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)			
				Metrolinx-related Sources	Highway 401	Background	Total
Baseline	9	1.5	196	1.6	41	22	64
	10	1.5	103	2.2	29	22	53
	11	1.5	206	1.6	34	22	58
	12	1.5	280	1.3	17	22	40
Future	9	1.5	196	2.9	24	22	49
	10	1.5	103	3.9	15	22	41
	11	1.5	206	2.8	19	22	44
	12	1.5	280	1.9	8	22	32
2020 CAAQS				**34 (Annual Average)**			
2025 CAAQS				**24 (Annual Average)**			

TABLE 4-93: AVERAGE SOURCE CONTRIBUTIONS TO PM2.5 AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 3

Scenario	Receptor	Height above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)			
				Metrolinx-related Sources	Highway 401	Background	Total
Baseline	9	1.5	196	0.09	3.4	7.8	11.3
	10	1.5	103	0.10	1.9	7.8	9.8
	11	1.5	206	0.08	2.6	7.8	10.5
	12	1.5	280	0.05	0.9	7.8	8.8
Future	9	1.5	196	0.12	1.3	7.8	9.2
	10	1.5	103	0.15	0.7	7.8	8.7
	11	1.5	206	0.12	1.0	7.8	8.9
	12	1.5	280	0.07	0.4	7.8	8.2
2020 CAAQS				**8.7 (annual average)**			

TABLE 4-94: AVERAGE SOURCE CONTRIBUTIONS TO BENZENE AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 3

Scenario	Height above Grade (m)	Receptor	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)			
				Metrolinx-related Sources	Highway 401	Background	total
Baseline	1.5	9	196	0.01	0.17	0.52	0.71
	1.5	10	103	0.02	0.10	0.52	0.64
	1.5	11	206	0.01	0.13	0.52	0.67
	1.5	12	280	0.01	0.05	0.52	0.58
Future	1.5	9	196	0.02	0.05	0.52	0.59
	1.5	10	103	0.02	0.03	0.52	0.57
	1.5	11	206	0.02	0.04	0.52	0.58
	1.5	12	280	0.01	0.02	0.52	0.54
Ontario AAQC				**0.45 (annual mean)**			

TABLE 4-95: AVERAGE SOURCE CONTRIBUTIONS TO BENZO(A)PYRENE AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 3

Scenario	Height above Grade (m)	Receptor	Distance from Tracks (m)	Annual Average Concentration (ng/m3)			
				Metrolinx-related Sources	Highway 401	Background	Total
Baseline	1.5	9	196	1.76E-06	4.66E-01	4.80E-02	5.14E-01
	1.5	10	103	3.15E-03	2.69E-01	4.80E-02	3.20E-01
	1.5	11	206	1.07E-03	3.59E-01	4.80E-02	4.08E-01
	1.5	12	280	7.70E-04	1.33E-01	4.80E-02	1.82E-01
Future	1.5	9	196	1.34E-03	1.49E-01	4.80E-02	1.98E-01
	1.5	10	103	2.11E-03	8.43E-02	4.80E-02	1.34E-01
	1.5	11	206	9.86E-04	1.14E-01	4.80E-02	1.63E-01
	1.5	12	280	6.38E-04	4.16E-02	4.80E-02	9.03E-02
Ontario AAQC				**0.00001 (annual mean)**			

4.7.6.4 Segment 4

The results for Segment 4 are similar to those for Segment 3, with predicted concentrations significantly influenced by the presence of Highway 401 adjacent to the corridor. Predicted concentrations at the worst-case receptor, under worst-case meteorological conditions and worst-case background air quality conditions are shown in **Table 4-96** (Baseline Scenario) and **Table 4-97** (Future Scenario). The predicted concentrations are within the provincial ambient air quality criteria (AAQCs) and national standards (CAAQS) for all contaminants and averaging periods, except the following:

- Maximum 24-hour and annual average benzene in both scenarios;
- Maximum 24-hour and annual average benzo(a)pyrene in both scenarios;
- 98th percentile daily maximum 1-hour and annual average NO_2 in both scenarios;
- 24-hour PM_{10} in the Baseline Scenario only;
- 24-hour $PM_{2.5}$ in the Baseline Scenario only, and annual average $PM_{2.5}$ in both scenarios.

Figure 4-25 shows the location(s) of the worst-case receptor for each of these contaminants and averaging periods. Similar to Segment 3, the worst-case receptors for PM, NO_2 and benzo(a)pyrene are adjacent to Highway 401. For benzene, it is adjacent to a station parking lot (Ajax GO station). For all contaminants, the predicted worst-case concentrations are significantly influenced by on-road vehicle emissions (Highway 401 and station parking lot). As with Segment 3, the cumulative concentrations decrease significantly between the Baseline and Future Scenario, due to the ongoing effect of federal vehicle emission regulations for on-road vehicles. The project's contribution is sufficiently small not to reverse the decreasing trend.

Figure 4-26 shows locations of selected receptors in Segment 4 that were examined in greater detail. **Table 4-98** through **Table 4-103** show information for the selected receptors, similar to what as shown previously for other segments. While the predicted hourly NO_2 concentrations exceed the CAAQS levels at the prescribed frequency (98^{th} percentile of daily maximum 1-hour concentration), they nevertheless meet the CAAQS levels most of the time. They meet the 2020 CAAQS more than 90% of the time at Receptors 14, 15 and 16, and about 75% of the time at Receptor 13 in the Future Scenario. Receptor 13 is adjacent to Highway 401 and Receptors 14 through 16 are more distant from the highway. The predicted hourly NO_2 concentrations meet the 2025 CAAQS 80% of the time or more at Receptors 14, 15 and 16, and about 55% of the time at Receptor 13 in the Future Scenario.

The predicted cumulative annual average NO_2 concentrations exceed the CAAQS levels, with the principal cause being background concentrations and the contribution from Highway 401. The contribution from Metrolinx-related sources to annual average NO_2 at the selected receptors is much smaller.

The predicted cumulative 24-hour and annual average $PM_{2.5}$ exceeds the CAAQS in the Baseline Scenario, but meets it in the Future Scenario, except at receptors adjacent to Highway 401, as illustrated by Receptor 13. Like NO_2, the contribution from Metrolinx-related sources to annual average $PM_{2.5}$, Benzene and Benzo(a)pyrene is small, and the background sources and Highway 401 are the principal cause of CAAQS and AAQCs being exceeded for these contaminants.

FIGURE 4-25: LOCATION OF WORST-CASE AIR QUALITY RECEPTORS IN SEGMENT 4 FOR BASELINE AND FUTURE BENZO(A)PYRENE, BENZENE, NO2, PM10 AND PM2.5

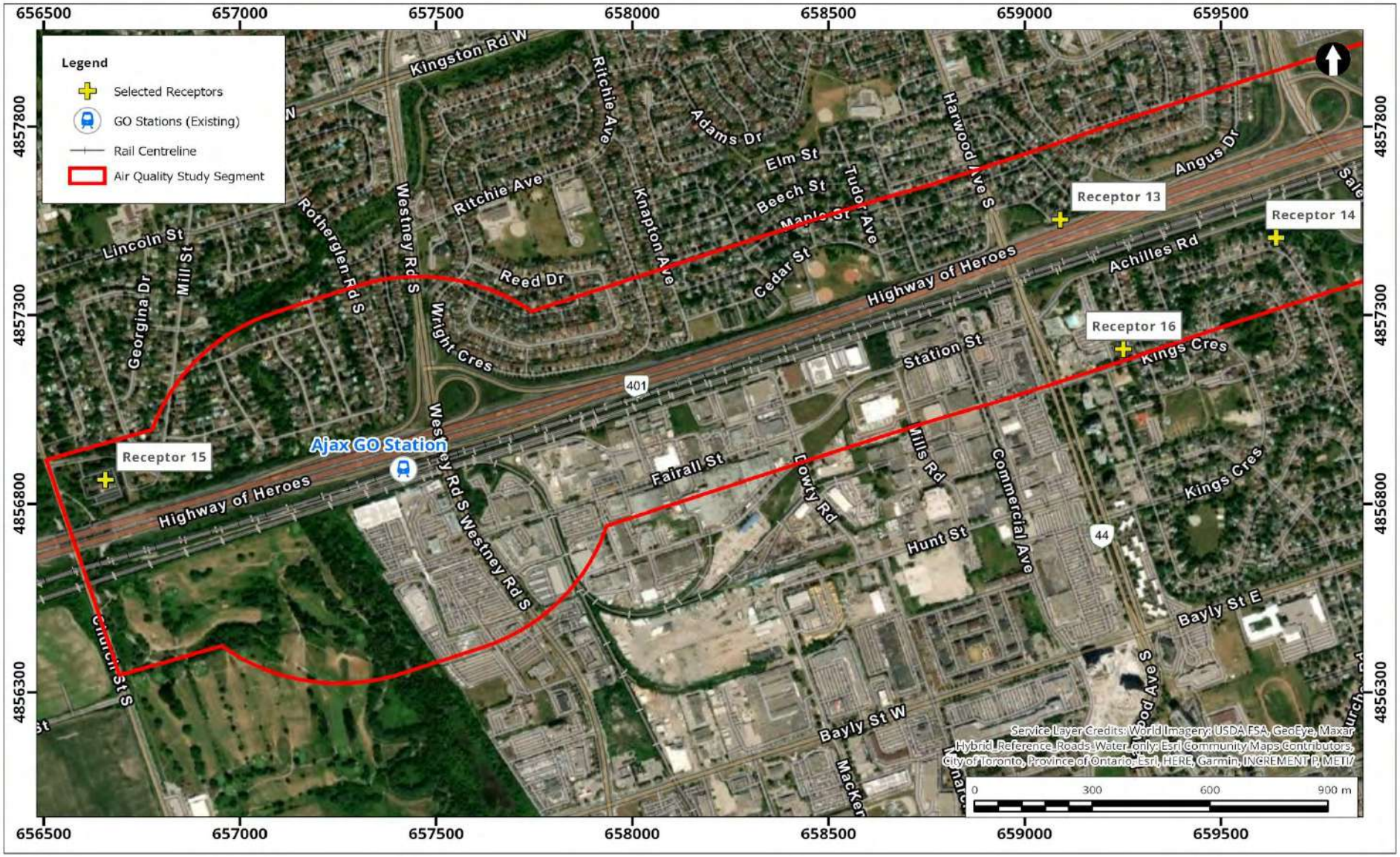

FIGURE 4-26: LOCATIONS OF SELECTED REPRESENTATIVE AIR QUALITY RECEPTORS IN SEGMENT 4

TABLE 4-96: MAXIMUM MODELLED CONCENTRATIONS AT WORST-CASE AIR QUALITY RECEPTOR LOCATION IN SEGMENT 4 FOR BASELINE (2015) SCENARIO

Pollutant	Averaging Time	All Modelled Sources (µg/m³)	Highway 401 (µg/m³)	Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criteria
AAQC						
NO_2	1 hour	253	248	314	400	79%
	24 hours	123	121	170	200	85%
Acrolein	1 hour	0.61	0.57	0.73	4.50	16%
	24 hours	0.18	0.16	0.24	0.4	60%
CO	1 hour	2462	2451	2680	36200	7.4%
	8-hr	953	948	2142	15700	14%
PM_{10}	24 hours	28.9	28.6	55	50	111%
Benzene	24 hours	3.9	1.1	4.7	2.3	203%
	Annual	0.96	0.27	1.49	0.45	330%
B(a)pyrene	24 hours	3.0E-03	3.0E-03	3.1E-03	5.0E-05	6166%
	Annual	7.19E-04	7.18E-04	7.7E-04	1.0E-05	7666%
Formaldehyde	24 hours	2.3	2.1	5.8	65	8.9%
Acetaldehyde	24 hours	1.2	1.0	2.9	500	0.6%
1,3-Butadiene	24 hours	0.54	0.15	0.61	10	6.1%
	Annual	0.14	0.037	0.174	2	8.7%
CAAQS						
NO_2	1 hour (2020)	211	207	263	119	222%
	1 hour (2025)	211	207	263	83	316%
	Annual (2020)	54	52	76	34	227%
	Annual (2025)	54	52	76	24	322%
$PM_{2.5}$	24 hours	20	13	29	27	106%
	Annual	5.3	5.2	13	8.8	148%

[1] Background levels based on difference between receptor concentration with and without background concentrations in model
[2] Results averaged based on CAAQS averaging periods described in Table 1 above

TABLE 4-97: MAXIMUM MODELLED CONCENTRATIONS AT WORST-CASE AIR QUALITY RECEPTOR LOCATION IN SEGMENT 4 FOR FUTURE SCENARIO

Pollutant	Averaging Time	All Modelled Sources (µg/m³)	Highway 401 (µg/m³)	Cumulative Concentration (µg/m³)	Objective (µg/m³)	Percentage of Criteria
AAQC						
NO_2	1 hour	162	145	204	400	51%
	24 hours	89	81	136	200	68%
Acrolein	1 hour	0.45	0.25	0.56	4.50	13%
	24 hours	0.109	0.07	0.17	0.4	44%
CO	1 hour	1208	1175	1427	36200	3.9%
	8-hr	511	465	1700	15700	11%
PM_{10}	24 hours	14.95	14.18	41	50	83%
Benzene	24 hours	2.04	0.34	2.8	2.3	124%
	Annual	0.57	0.084	1.10	0.45	244%
B(a)pyrene	24 hours	9.6E-04	9.5E-04	1.0E-03	5.0E-05	2085%
	Annual	2.3E-04	2.3E-04	2.8E-04	1.0E-05	2796%
Formaldehyde	24 hours	1.48	0.97	5.0	65	7.7%
Acetaldehyde	24 hours	0.60	0.42	2.3	500	0.5%
1,3-Butadiene	24 hours	0.303	0.032	0.37	10	3.7%
	Annual	0.084	0.0079	0.123	2	6.2%
CAAQS						
NO_2	1 hour (2020)	141	125	184	119	155%
	1 hour (2025)	141	125	184	83	222%
	Annual (2020)	39	33	61	34	182%
	Annual (2025)	39	33	61	24	258%
$PM_{2.5}$	24 hours	5.6	5.1	21	27	78%
	Annual	2.3	2.01	10	8.8	114%

[1] Background levels based on difference between receptor concentration with and without background concentrations in model
[2] Results averaged based on CAAQS averaging periods described in Table 1 above

TABLE 4-98: RANGE OF PREDICTED CUMULATIVE 1-HR NO2 CONCENTRATIONS AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 4

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	Hourly Concentration (µg/m^3)			
				Maximum	Mean	Median	Minimum
Baseline	13	1.5	105	313	100	94	29
	14	1.5	116	182	71	61	29
	15	1.5	205	190	75	62	29
	16	1.5	268	168	63	56	29
Future	13	1.5	105	203	85	75	29
	14	1.5	116	156	64	59	29
	15	1.5	205	157	64	58	29
	16	1.5	268	151	57	56	29
Ontario AAQC				**400 (1-hr), 200 (24-hr)**			
2020 CAAQS				**119 (98th percentile daily max 1-hr)**			
2025 CAAQS				**83 (98th percentile daily max 1-hr)**			

TABLE 4-99: AVERAGE SOURCE CONTRIBUTIONS TO NO2 AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 4

Scenario	Receptor	Height Above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)			
				Metrolinx-related Sources	Highway 401	Background	Total
Baseline	13	1.5	105	1.5	52	22	75
	14	1.5	116	1.9	22	22	46
	15	1.5	205	1.3	27	22	50
	16	1.5	268	1.0	16	22	39
Future	13	1.5	105	5.6	33	22	60
	14	1.5	116	6.1	11	22	39
	15	1.5	205	3.6	14	22	39
	16	1.5	268	3.1	8	22	33
2020 CAAQS				**34 (Annual Average)**			
2025 CAAQS				**24 (Annual Average)**			

TABLE 4-100: RANGE OF PREDICTED CUMULATIVE 24-HR PM2.5 CONCENTRATIONS AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 4

Scenario	Receptor	Height above Grade (m)	Distance from Tracks (m)	24-hour Average Concentration (µg/m^3)			
				Maximum	Mean	Median	Minimum
Baseline	13	1.5	105	37	21	21	15
	14	1.5	116	21	17	17	15
	15	1.5	205	24	17	17	15
	16	1.5	268	19	16	16	15
Future	13	1.5	105	25	18	18	15
	14	1.5	116	18	16	16	16
	15	1.5	205	19	16	16	15
	16	1.5	268	17	16	16	15
2020 CAAQS				**27 (98th percentile)**			

TABLE 4-101: AVERAGE SOURCE CONTRIBUTIONS TO PM2.5 AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 4

Scenario	Receptor	Height above Grade (m)	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)			
				Metrolinx-related Sources	Highway 401	Background	Total
Baseline	13	1.5	105	0.1	5.0	7.8	12.9
	14	1.5	116	0.1	1.3	7.8	9.2
	15	1.5	205	0.1	1.6	7.8	9.5
	16	1.5	268	0.0	0.8	7.8	8.7
Future	13	1.5	105	0.3	2.0	7.8	10.0
	14	1.5	116	0.2	0.5	7.8	8.5
	15	1.5	205	0.1	0.6	7.8	8.6
	16	1.5	268	0.1	0.3	7.8	8.2
2020 CAAQS				**8.7 (annual average)**			

TABLE 4-102: AVERAGE SOURCE CONTRIBUTIONS TO BENZENE AT SELECTED AIR QUALITY RECEPTORS

Scenario	Height above Grade (m)	Receptor	Distance from Tracks (m)	5-Year Average Concentration (µg/m^3)			
				Metrolinx-related Sources	Highway 401	Background	total
Baseline	1.5	13	105	0.01	0.26	0.52	0.79
	1.5	14	116	0.01	0.07	0.52	0.60
	1.5	15	205	0.02	0.09	0.52	0.62
	1.5	16	268	0.01	0.04	0.52	0.57
Future	1.5	13	105	0.03	0.08	0.52	0.63
	1.5	14	116	0.03	0.02	0.52	0.57
	1.5	15	205	0.02	0.03	0.52	0.57
	1.5	16	268	0.01	0.01	0.52	0.55
Ontario AAQC				**0.45 (annual mean)**			

TABLE 4-103: AVERAGE SOURCE CONTRIBUTIONS TO BENZO(A)PYRENE AT SELECTED AIR QUALITY RECEPTORS IN SEGMENT 4

Scenario	Height above Grade (m)	Receptor	Distance from Tracks (m)	Annual Average Concentration (ng/m3)			
				Metrolinx-related Sources	Highway 401	Background	Total
Baseline	1.5	13	105	5.60E-07	6.99E-01	4.80E-02	7.47E-01
	1.5	14	116	4.94E-04	1.87E-01	4.80E-02	2.35E-01
	1.5	15	205	3.26E-04	2.29E-01	4.80E-02	2.77E-01
	1.5	16	268	2.42E-04	1.18E-01	4.80E-02	1.66E-01
Future	1.5	13	105	2.00E-03	2.23E-01	4.80E-02	2.73E-01
	1.5	14	116	1.73E-03	5.85E-02	4.80E-02	1.08E-01
	1.5	15	205	2.42E-03	7.30E-02	4.80E-02	1.23E-01
	1.5	16	268	1.11E-03	3.68E-02	4.80E-02	8.60E-02
Ontario AAQC				**0.00001 (annual mean)**			

4.7.6.5 Potential Effects and Mitigation Measures

Concentrations of relevant air contaminants were predicted under worst-case meteorological conditions and reasonably worst-case background air quality conditions. This was done for numerous receptor locations, so that the worst-case receptor location(s) could be identified. The analysis was performed for a 2025 horizon year, using rail service levels that were projected to approximately 2037, with a 10% margin of safety applied on top.

Some of the contaminants are predicted to exceed standards or criteria at the worst-case receptor, as follows:

- 1-hour and 24-hour NO_2 concentrations meet the current Ontario AAQC's, but 1-hour and annual average NO_2 do not meet the more recent and more stringent Canadian Ambient Air Quality Standards (CAAQS) in either the Baseline or Future Scenario.

- Annual average $PM_{2.5}$ exceed the CAAQS in both the Baseline and Future Scenario. The 24-hour average $PM_{2.5}$ exceeds the CAAQS in the Baseline Scenario only (at locations adjacent to Highway 401).
- Maximum 24-hour PM_{10} exceeds the provincial AAQC in the Baseline Scenario only (at locations adjacent to Highway 401).
- 24-hour and annual average Benzo(a)pyrene exceed the provincial AAQCs in both scenarios.
- 24-hour and annual average Benzene exceed the provincial AAQCs in both scenarios

Acrolein, Carbon Monoxide, Formaldehyde, Acetaldehyde, and 1,3-Butadiene are all predicted to be within their objectives in both the Baseline and Future Scenario. As mentioned previously, the AAQCs and CAAQS represent desirable levels, rather than statutory limits. Measures mandated to achieve the CAAQS should consider technical achievability, practicality and implementation costs (CCME, 2019).

The following paragraphs briefly describe the results for contaminants that are predicted to exceed standards or criteria.

NO_2

The predicted future hourly NO_2 concentrations do not meet the 2020 and 2025 CAAQS levels at the prescribed frequency level (at least 98% of the time for the daily maximum 1-hour concentration). This is the case throughout much of the study area. However, the hourly NO_2 concentrations do meet the CAAQS levels a high percentage of the time (more than 75% of the time), except at locations immediately adjacent to Highway 401. The annual average NO_2 levels also exceed the 2020 and 2025 CAAQS, but the principal cause is background sources, including Highway 401 in areas where the LSE corridor lies adjacent to the highway (eastward from Whites Road in Pickering). The average contribution of Metrolinx-related emissions is much smaller than the background sources, with the exception of receptors that are immediately adjacent to the corridor.

$PM_{2.5}$

The predicted future annual average $PM_{2.5}$ levels do not meet the CAAQS along the section of corridor that lies adjacent to Highway 401. $PM_{2.5}$ levels meet the CAAQS elsewhere. The principal cause is Highway 401 and other background sources of emission. The contribution of Metrolinx-related sources is small (less than 10%) at all receptors. The predicted cumulative $PM_{2.5}$ concentrations in areas where the corridor is adjacent to the highway are lower in the Future Scenario than in the Baseline Scenario, due to expected decreases in tailpipe emissions from on-road vehicles using the highway.

Benzene and Benzo(a)pyrene

Since background levels of Benzene and Benzo(a)pyrene exceed the AAQCs on their own, the cumulative concentrations also exceed the AAQC's. The contribution of Metrolinx-related sources to these contaminants is generally small, except at receptor locations immediately adjacent to station parking lots, where the contribution from passenger cars operating in the parking lots can be relatively high. The predicted levels adjacent to parking lots are significantly lower in the Future Scenario than the Baseline Scenario, due to expected future decreases in tailpipe emissions from on-passenger cars.

4.7.7 Noise and Vibration

The assessment of potential noise and vibration effects within this corridor is detailed in **Appendix G6**. **Appendix O2** provides maps showing the locations of receptors and recommended noise and vibration mitigation. A summary of mitigation and monitoring commitments for this section is included in **Table 4-130**. Baseline and future service levels (along with modeled infrastructure) within this corridor are detailed in Section 2.4.6.

4.7.7.1 Operational Noise Assessment

The predicted Adjusted Noise Impacts for the project are summarized in **Table 4-104**, and the locations of the "segments" are presented in **Figure 3-32**.

Impact ratings for the evaluated 68 representative receptors listed in the table can be summarised as follows:

- 4 nighttime Adjusted Noise Impacts were classified as Significant (i.e., between 5 dB and 9.99 dB).
- 9 daytime and 13 nighttime Adjusted Noise Impacts were classified as Noticeable (i.e., between 2.99 dB and 5 dB)
- 59 daytime and 51 nighttime Adjusted Noise Impacts were classified as Insignificant (i.e., less than 2.99 dB)

There are no Adjusted Noise Impacts that were classified as very significant (i.e., greater than 10 dB increase).

Adjusted Noise Impacts that were predicted to be greater than 5 dB in some cases; The investigation of mitigation on the LSE Rail Corridor is driven by the increased traffic volumes associated with the Stouffville Rail Corridor. No adjusted noise impacts over 5 dB were predicted east of the Scarborough Junction, where the Stouffville Rail Corridor branches north. The negative numbers seen in **Table 4-104** are the result of the future predominantly electric train fleet replacing the existing full diesel fleet. Although train volumes are increasing, this increase is off-set by the use of quieter electric locomotives. In some cases, the negative Adjusted Noise Impacts are the result of existing predicted levels that are below the default Pre-project sound levels.

TABLE 4-104: SUMMARY OF ADJUSTED NOISE IMPACTS

Segment	Adjusted Impact Rating [1]	Average Objective [2]		Average Adjusted Noise Impact (dB)		Investigate Mitigation? [3]
		Day	Night	Day	Night	
Carlaw Ave to Danforth GO	Significant	-	62.1	-	5.4	Yes
	Noticeable	64.8	61.5	3.7	3.8	No
	Insignificant	64.2	60.3	2.1	2.3	No
Danforth GO to Scarborough GO	Significant	-	59.6	-	5.1	Yes
	Noticeable	64.6	59.2	3.9	3.4	No
	Insignificant	60.7	56.5	0.2	1.1	No
Scarborough GO to Eglinton GO	Insignificant	60.4	56.4	-0.1	0.6	No
Eglinton GO to Guildwood GO	Insignificant	60.0	56.3	1.7	0.6	No
	Noticeable	61.9	-	3.0	-	No

Segment	Adjusted Impact Rating [1]	Average Objective [2]		Average Adjusted Noise Impact (dB)		Investigate Mitigation? [3]
		Day	Night	Day	Night	
Guildwood GO to Rouge Hill GO	Insignificant	60.7	57.3	1.2	0.5	No
Rouge Hill GO to Pickering GO	Insignificant	59.2	57.0	-0.2	-0.4	No
Pickering GO to Ajax GO	Insignificant	55.0	51.7	-4.1	-2.1	No
Ajax GO to Whitby GO	Insignificant	55.0	50.8	-4.0	0.6	No
Whitby GO to Oshawa GO	Insignificant	59.0	56.2	-7.1	-6.0	No

Notes: [1] Ratings are quantified as: Insignificant – Less than 3 dB, Noticeable – 3 dB to 4.99 dB, Significant – 5 to 9.99 dB.

[2] The objective is the higher of either the Pre-project sound level or the 55 / 50 dBA default day/night sound levels.

[3] Daytime is a 16-hour period (i.e., from 0700h to 2300h) and Nighttime is an 8-hour period (i.e., from 2300h to 0700h).

[4] The potential to mitigate is considered when a significant (or greater) impact is predicted. This is equivalent to an increase of 5 dB or greater, relative to the objective level, as per the MOEE/GO Protocol. An adjusted noise impact greater than 5 dB requires the investigation of mitigation.

The predicted sound levels from the electric traction power facilities, were evaluated at nearby receptors and are summarized in **Table 4-105**. The predicted sound levels from the Scarborough SWS at nearby receptors were above the applicable sound level limits for nighttime. The TPF facilities study were based on assumptions regarding site configuration and equipment and therefore the resulting recommendations are broad. As such, a detailed acoustical design review is recommended at the detailed design stage to ensure that appropriate noise control measures to meet the NPC-300 limits have been incorporated into the final design. An updated evaluation should include more accurate sound levels and placement for transformers and, if necessary, mitigation measures such as low noise fans or barriers should be investigated for the Scarborough SWS during this stage of the design. The NPC-300 sound level limits will be met with these measures.

The predicted sound levels from the electric traction power facilities at nearby receptors were below the applicable limits for the Durham SWS and the WRMF TPS; therefore, no mitigation measures were investigated for these facilities.

TABLE 4-105: PREDICTED SOUND LEVELS FROM ELECTRIC TRACTION POWER FACILITIES

Receptor ID	Nearby	Evaluation Location	Period [1]	Predicted Noise Levels (dBA)	Applicable Limit (dBA)	Compliance with Performance Applicable Limit
R041	Scarborough SWS	Plane of Window	Daytime\Evening	54	50	No
			Nighttime	54	45	No
		Outdoor Area	Daytime\Evening	54	50	No
R064	Durham SWS	Plane of Window	Daytime\Evening	34	50	Yes
			Nighttime	34	45	Yes
		Outdoor Area	Daytime\Evening	33	50	Yes
R074	WMRF TPS	Plane of Window	Daytime\Evening	16	50	Yes
			Nighttime	16	45	Yes
		Outdoor Area	Daytime\Evening	15	50	Yes

Notes: [1] Daytime occurs from 0700-1900h. Evening occurs from 1900h-2300h. Nighttime occurs from 2300h to 0700h

The predicted sound levels from the Post-project layover sites were evaluated at nearby receptors and are summarised in **Table 4-106**. The predicted sound levels for the Post-project scenario at the Midland Layover were over the applicable limit of 55 dBA. Therefore, mitigation measures were investigated for this facility.

TABLE 4-106: PREDICTED SOUND LEVELS FROM POST-PROJECT LAYOVER SITES

Post-Project Layover	Receptor ID	Evaluation Location	Period	Predicted 1-hr L_{EQ} Sound Levels (dBA)	Applicable Limit (dBA)	Compliance with Performance Applicable Limit
Midland Layover	R37	Outdoor Area	Daytime\Evening	61	55	No
		Plane of Window	Daytime\Evening \Nighttime	63	55	No
	R39	Outdoor Area	Daytime\Evening	56	55	No
		Plane of Window	Daytime\Evening \Nighttime	60	55	No
Henry Street Layover	R71	Outdoor Area	Daytime\Evening	46	55	Yes
		Plane of Window	Daytime\Evening \Nighttime	49	55	Yes
Henry Street & WMRF Layover	R72	Outdoor Area	Daytime\Evening	45	55	Yes
		Plane of Window	Daytime\Evening \Nighttime	47	55	Yes
	R73	Outdoor Area	Daytime\Evening	38	55	Yes
		Plane of Window	Daytime\Evening \Nighttime	41	55	Yes

WMRF & Oshawa Layover	R74	Outdoor Area	Daytime\Evening	34	55	Yes
		Plane of Window	Daytime\Evening \Nighttime	37	55	Yes

Notes: [1] The L_{EQ} is evaluated for any 1 hour period

Along the Lakeshore East Corridor, the investigation of mitigation was triggered along most of the study area. In total, 5 barriers were assessed for feasibility. A summary of all the barriers investigated and the results of the technical feasibility, constructability and economic feasibility studies can be found in **Table 4-107**. The noise barrier must achieve a minimum reduction of 5 dB to be considered technically feasible (from an acoustics perspective). To achieve a 5 dB reduction at receptors, a 5 m preliminary noise barrier was modelled at the ROW between the rail and receptors. If the 5 dB reduction was not achieved a 6 m then 7 m barrier was considered.

TABLE 4-107: SUMMARY OF BARRIER FEASIBILITY

Barrier	Figure[84]	Technical Feasibility (≥5 dB Reduction)	Constructability	Economic Feasibility	Overall Feasibility
Barrier 01	G.1.1	Yes	Yes	Yes	Yes
Barrier 02 & 03[1]	G.1.1	Yes	Yes	Yes	Yes
Barrier 04	G.1.1	Yes	Yes	Yes	Yes
Barrier 05	G.1.1	Yes	Yes	No	No
Summary					
Number of "Yes"		5	5	4	4
Number of "No"		0	0	1	1
Number of "Not Assessed"		0	0	0	0

Notes: [1] Barrier split per CEC recommendation

4.7.7.2 Operational Vibration Assessment

Where sensitive receptors fall within areas of influence where operational vibration levels are expected to exceed the MOEE/GO Protocol vibration limits, mitigation is recommended. Of the 44 switches included in this assessment, 11 triggered assessment of mitigation. Of the approximately 24 km of trackwork, approximately 3.2 km triggered assessment of mitigation. These results are summarized in **Table 4-108**.

Where vibration mitigation is recommended, further evaluation based on administrative, operational, economic and technical feasibility should be completed at the detailed design stage. The recommended vibration mitigation is identified as ballast mats, though consideration of other mitigation options, such as under sleeper pads or resilient fixation can be assessed at the detailed design stage.

TABLE 4-108: SUMMARY OF VIBRATION MITIGATION REQUIRED

New Infrastructure Assessed	Location	Mitigation Required?	Receptors Affected
Switch	Mile 328.98	Yes	Homes along Oakcrest Ave, Costain Ave, Brookside Dr, Beach View Cres, and Golfview Ave.

[84] Figures referenced are included in **Appendix G6.**

New Infrastructure Assessed	Location	Mitigation Required?	Receptors Affected
Switch	Mile 328.37	Yes	Apartments along Trent Ave. Homes along Ice Cream Ln, White Post St, and Drummondville Ln.
Switch	Mile 328.36	Yes	
Switch	Mile 328.30	Yes	
Switch	Mile 328.30	Yes	
Switch	Mile 326.42	Yes	Homes along Aylesworth Ave.
Switch	Mile 326.36	Yes	
Switch	Mile 323.44	Yes	Homes along Bridlegrove Dr.
Switch	Mile 317.06	Yes	Homes along Portwine Dr, and Stotts Terr.
Switch	Mile 317.01	Yes	
Switch	Mile 316.99	Yes	
New track from Don River to Scarborough Junction	120 m – Receptors between Eastern Ave to Queen Street East	Yes	Homes along McGee St.
	200 m – Receptors between Paisley Ave to Logan Ave	Yes	Home along Paisley Ave, and Logan Ave.
	350 m – Receptors between Gerrard St E to Kiswick	Yes	Mixed use buildings along Pape Ave.
	140 m – Receptors between Condor Ave to TTC Greenwood Yard	Yes	Apartments along Pape Ave. Homes along Poucher St, and Egan Ave.
	250 m – Receptors between Greenwood Ave to Sandstone Ln	Yes	Homes along Boultbee Ave.
	100 m - Receptors between Hillingdon Ave to Drayton Ave	Yes	Homes at the end of Unity Rd, Lount St, Sandstone Ln, and Valifor Pl.
	100 m - Receptors between Aldergrove Ave to Woodbine Ave	Yes	Homes at the end of Hillingdon Ave, and Drayton Ave.
	230 m - Receptors between Beck Ave to Main St	Yes	Homes along Oakcrest Ave. Townhouses along Stephenson Ave.
	70 m - Cornell Ave to Warden Ave	Yes	Home along Clonmore Dr.
	185 m - Danforth Ave to Eastwood Ave	Yes	Homes at the end of Eastwood Ave.
	215 m - Birchmount Rd to Lillington Ave	Yes	Homes along Aylesworth Ave.
	950 m - Woodrow Ave to Kennedy Rd	Yes	Homes along Aylesworth Ave.
	160 m - Kennedy Rd to Claremore Ave	Yes	Homes along Aylesworth Ave.
	170 m - St. Claire Ave E to Midland Ave	Yes	Home along Moonseed Ct.
New track from Guildwood to Rouge Hill	420 m – Receptors between End of Rouge Hill Station to Portwine Dr	Yes	Homes along, Wuthering Heights Rd, Portwine Dr, and Stotts Terr.

4.7.7.3 Potential Effects and Mitigation Measures

Operational Noise Assessment

All Adjusted Noise Impacts were either insignificant (i.e., less than 2.99 dB), noticeable (i.e., between 3 dB and 4.99 dB) or significant (i.e., between 5 dB and 9.99 dB) for the Lakeshore East Corridor train movements. Therefore, investigation of noise mitigation was required. Five barriers were investigated, four of which (Barriers 01, 02, 03, and 04) were found to be technically and economically feasible.

For electric traction power facilities (TPF), the predicted noise levels at nearby receptors were below the applicable limits at the Durham SWS and WMRF TPS, and above the applicable

limits at the Scarborough SWS. Therefore, a detailed assessment and potentially noise mitigation for the Scarborough SWS is required.

For layover sites, the predicted noise levels at nearby receptors were below the limits for all layovers except Midland layover two barriers were investigated, one of which was found to be technically and economically feasible (Barrier 04). Noise mitigation for trains idling at all other layover sites was not required.

Operational Vibration Assessment

Predicted vibration effects from new switches were found to exceed the MOEE/GO Protocol limits and mitigation was recommended for 11 of the 44 new switches. Predicted vibration effects from new trackwork were found to exceed the MOEE/GO Protocol limits and mitigation was recommended for 3.2 km of 24 km of new trackwork. The recommended vibration mitigation is identified as ballast mats, though other mitigation options can be considered such as under sleeper pads or resilient fixation. Further evaluation of the mitigation options based on administrative, operational, economic and technical feasibility should be completed at the detailed design stage.

4.7.8 Visual

A Visual Assessment Report (refer to **Appendix H**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-131**.

4.7.8.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.8.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.8.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

4.7.8.3.1 Potential Effects and Mitigation Measures

The Midland Layover is proposed within an urbanized area where there is existing track infrastructure. While parts of the corridor are surrounded by *Employment/Commercial* uses, there are also single-family homes and high-rise residential buildings that are more than 20 metres away from the existing ROW. This results in the proposed OCS layover having a *Low* visual impact on its surroundings, particularly when trains are parked for an extended period of time. It should be noted that these visual impacts are somewhat mitigated by the presence of an existing distribution centre that blocks views to the proposed OCS from the residential homes to the south of the rail corridor.

The rendering in **Figure 4-27** depicts the visual impacts of the proposed layover facility on the basis of the current conceptual design. For the purposes of this study, this report focuses on viewpoints from visual receptors in the surrounding area, as discussed below.

The additional OCS infrastructure in proximity to McCowan Road within this section is associated with a storage and passing track. Due to the close proximity of the residences to the additional OCS infrastructure, this section is categorized as having a *Moderate* visual impact.

The installation of OCS infrastructure will affect the viewshed along the rail corridors, particularly in areas of vegetation/tree clearing. Visual impact mitigation strategies for OCS will be identified and incorporated into the detailed design process. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables (see **Appendix F** and **Appendix G6** for further details).

Mitigation measures related to the proposed OCS infrastructure are further described in **Table 4-131**.

FIGURE 4-27: PROPOSED MIDLAND LAYOVER LOOKING NORTH

4.7.8.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.8.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.8.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.8.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.8.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

4.7.8.8.1 Potential Effects and Mitigation Measures

Within this section, the corridor passes through a largely *Commercial* area, containing big box retail stores and little to no visual receptors. This area is classified as having a *Negligible* visual impact due to the corridor existing as part of the current view and the additional OCS infrastructure being located within the existing rail ROW.

Additionally, the proposed OCS are not anticipated to impact surrounding visual receptors since the views are already disturbed by passing GO trains and screened by *Industrial* buildings (see **Figure 4-29**). Passengers travelling southbound along Thickson Road may experience a brief visual disturbance due to the proposed OCS, however, given that the roadway is at a much lower elevation, a passenger's sightline is not expected to be impacted. Therefore, visual impacts have been categorized as *Negligible* (see **Figure 4-28**).

FIGURE 4-28: EXISTING THICKSON ROAD BRIDGE – VIEW FROM STREET SOUTHBOUND

FIGURE 4-29: EXISTING BUSINESSES NORTH OF THE RAIL CORRIDOR – VIEW FROM PARKING LOT

The latter part of this section comprises the Oshawa GO Station, which contains a bus terminal and a large parking lot north of the rail corridor and a freight rail yard south of the rail corridor (see **Figure 4-30**). *Negligible* impacts to the existing views are expected as the additional OCS will be almost entirely within the existing ROW. In addition, the surrounding area is largely *Employment/Industrial* lands containing storage units and a parking lot, where views are already disturbed due to the Oshawa GO Station and train storage area.

There are no anticipated impacts in this section; therefore, no mitigation measures have been proposed.

FIGURE 4-30: EXISTING OSHAWA GO STATION – BIRD'S EYE VIEW (LOOKING WEST)

4.7.9 EMI & EMF

An EMI & EMF Assessment Report (refer to **Appendix J**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-133**.

Throughout this corridor, as with all other corridors under study for the impact assessment, the potential effects and mitigations are identical. This is true regardless of the presence of a layover facility in the territory.

4.7.9.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.9.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.9.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

4.7.9.3.1 Potential Effects and Mitigation Measures

The potential effects due to operating an electrified transit system for this segment are largely the result of overhead catenary wires to power the train, and the operation of 25kV aerial feeder lines to power the catenary. They are summarized as follows:

- EMI;
- Time-Varying EMFs;
- Induced Current in Neighbouring Metallic Wires, Fences, Pipelines, Cables, and Earth (grounding) Networks;
- Unintended Contact with High-Voltage Source; and
- ELF EMF.

The EMI would be the result of high frequency generated by the scraping of the pantograph down the catenary and the motors used to power the train. The EMFs would be the result of current flow down the catenary and within the passenger compartments of the train. The induced current would be the result of current flow down the catenary or the feeder wires. The unintended contact with the high-voltage source would be the result of access to the catenary, live wires inside the passenger compartment, or access to the feeder wires.

Mitigation for each of these potential effects has been implemented as part of the design of the system. In a general sense, for EMI, the power methodology for the Metrolinx system—auto-transformer power—has been selected specifically for its reduction of this type of interference. Additional mitigation methodologies include the following:

- Implementation and use of an EMC Control Plan.
- Proper design, e.g., grounding and shielding as per applicable Canadian electrical standards, physical separation, as identified from bench-marking similar properties across North America.
- During the electrification commissioning phase, overall ELF and RF emissions emanating from the GO electrified railway system as a whole will be field tested and verified to ensure EMFs are within the limits of applicable industry standards.
- Verify ELF EMF by measurements taken before and after project implementation.

4.7.9.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.9.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.9.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.9.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.9.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

4.7.9.8.1 Potential Effects and Mitigation Measures

Potential effects and mitigation measures associated with EMI & EMF at this location are detailed in Section 4.7.9.3.

4.7.10 Utilities

A Utilities Assessment Report (refer to **Appendix I**) details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-132**.

4.7.10.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.10.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.10.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

Further utility investigations will be undertaken during detailed design to determine appropriate action or resolution to the unknown utility alignment within the Midland Layover footprint.

4.7.10.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.10.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.10.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.10.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.10.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum.

4.7.11 Stormwater Management

A Preliminary Stormwater Management Assessment (refer to **Appendix K**) has been prepared which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-134**.

4.7.11.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.11.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.11.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of detailed design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

For a more detailed discussion regarding anticipated Stormwater Management impacts and applicable mitigation measures at the proposed Midland Layover Facility, please refer to the 2020 Scarborough Junction Grade Separation EPR. As electrification infrastructure is a component of this facility, stormwater management measures will be coordinated as part of future project phases.

4.7.11.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.11.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.11.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.11.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.11.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

Quantity and drainage patterns are not anticipated to be affected due to electrification infrastructure proposed along the corridors based on the preliminary analysis undertaken as part of the conceptual design work.

Notwithstanding this, if environmental impacts are subsequently identified as part of detailed design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction.

4.7.12 Groundwater and Wells

A Hydrogeological Assessment Study (refer to **Appendix L**) has been prepared which details the impact assessment completed for this discipline. A summary of mitigation and monitoring commitments for this section is included in **Table 4-135**.

4.7.12.1 OCS: Section LSE-1 – Don Yard Layover to Danforth Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.12.2 OCS: Section LSE-2 – Danforth Station to Scarborough Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.12.3 OCS/New Layover Facility - Midland Layover: Section LSE-3 – Scarborough Station to Guildwood Station

4.7.12.3.1 Potential Effects and Mitigation Measures

The subsurface footprint of the OCS foundations is relatively small and shallow and therefore not expected to cause any adverse groundwater impacts.

There are no anticipated footprint impacts of the proposed OCS in this segment; therefore, no mitigation measures have been proposed.

At the Midland Layover, construction activities will result in an anticipated grade raise of approximately one metre. The additional OCS infrastructure footprint is expected to be less than one metre in depth and therefore is not expected to cause any adverse groundwater impacts.

As dewatering is expected to be limited and there is availability of municipal water, there is not expected to be any adverse groundwater impacts to local well users. The presence of these wells should be confirmed further prior to construction as some may no longer be in existence.

4.7.12.4 OCS: Section LSE-4 – Guildwood Station to Rouge Hill Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.12.5 OCS: Section LSE-5 – Rouge Hill Station to Pickering Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.12.6 OCS: Section LSE-6 – Pickering Station to Ajax Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.12.7 OCS: Section LSE-7 – Ajax Station to Whitby Station

There is no additional infrastructure proposed in this section beyond what has already been assessed as part of the 2017 TPAP.

4.7.12.8 OCS: Section LSE-8 – Whitby Station to Oshawa Station

4.7.12.8.1 Potential Effects and Mitigation Measures

The surrounding area within 500 metres is industrial/commercial. The Tributary of Corbett Creek is located north and south of the ROW with the tributary crossing beneath the tracks. However, railway infrastructure already exists and crosses this tributary; therefore, the additional OCS footprint infrastructure is not expected to impact the tributary.

There were five (5) domestic supply wells identified within 500 metres of the rail corridor in this section. The area is now fully developed with industrial uses that have municipal water servicing, and therefore it is expected that the well is no longer in use. However, no decommissioning records were found. As the area is supplied with municipal water, and no permanent dewatering is required for the infrastructure footprint, no adverse effects are anticipated.

Review of well logs for the area does not provide an estimate for static groundwater levels; however, most monitoring and observation holes installed in the vicinity of the Site generally extend to depths of 4.5 to six (6) metres below grade. Corbett Creek crosses beneath the existing rail ROW just west of the Oshawa GO Station. As railway infrastructure already exists and crosses this tributary, the additional infrastructure is not expected to result in additional footprint impacts.

The subsurface footprint of the OCS foundations is relatively small and shallow and therefore not expected to cause any adverse groundwater impacts. No additional mitigation measures have been proposed.

4.8 Operations and Maintenance Impacts

4.8.1 Natural Environment

An Integrated Vegetation Management (IVM) Plan will be developed and implemented that is in adherence with the IVM framework outlined in the Metrolinx's Vegetation Guideline (2020). The Guideline's selection criteria will be used to assess the vegetation present as compatible or incompatible, and manage it (if necessary) in a way which meets safety needs in a timely manner, is sensitive to environmental conditions, and maximizes cost-effectiveness.

The presence, density, and location of compatible and incompatible species will be monitored as per the frequency and methodology established in the Bi-Annual Monitoring component of the IVM framework. Bi-Annual Monitoring is made up of pre-treatment and post-treatment monitoring events that will be carried out via field, aerial, and high-rail vehicle or train surveys conducted by qualified specialists.

4.8.2 Preliminary Environmental Site Assessment

There are no changes or additions to operations and maintenance practices beyond what has already been assessed as part of the 2017 TPAP.

4.8.3 Built Heritage Resources and Cultural Heritage Landscapes

There are no changes or additions to operations and maintenance practices beyond what has already been assessed as part of the 2017 TPAP.

4.8.4 Archaeology

There are no changes or additions to operations and maintenance practices beyond what has already been assessed as part of the 2017 TPAP.

4.8.5 Land Use

There are no changes or additions to operations and maintenance practices beyond what has already been assessed as part of the 2017 TPAP.

4.8.6 Socio-Economic

4.8.6.1 Overhead Contact System

Where facilities or residential areas are close to the additional OCS infrastructure area, there is the potential for visual effects and/or noise effects. The Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF Impact Assessments identify areas where the OCS may affect views of the corridor or where noise levels may increase, and recommend mitigation measures to address potential effects.

As discussed in Sections 4.3 to 4.7, fourteen sensitive facilities are in the vicinity of the rail corridor ROW. These are summarized in **Table 4-109** below.

TABLE 4-109: SENSITIVE FACILITIES WITHIN THE VICINITY OF THE RAIL CORRIDOR ROW

Corridor	Type	Name	Address	Distance from OCS Impact Zone (5 m)
Barrie	Child Care Centre	Aurora Early Learning Centre	138 Centre Street	25 m
	School	Aurora Montessori School	330 Industrial Parkway North	30 m
	School	École élémentaire catholique Saint-Jean	90 Walton Drive	110 m
	Community Landmark	Newmarket Community Centre and Lions Hall	200 Doug Duncan Drive	30 m
	Community Landmark	Newmarket Recreational youth Centre & Sk8 Park	56 Charles Street	40 m
	Community Landmark	Church on the GO	465 Davis Drive	0 m

Corridor	Type	Name	Address	Distance from OCS Impact Zone (5 m)
	Care Centre	Mill Creek Care Centre	286 Hurst Dr, Barrie	70 m
	Community Centre	Southshore Community Centre	205 Lakeshore Dr, Barrie	130 m
Stouffville	School	Bill Crothers Secondary School	44 Main St, Unionville	60 m
	Long Term Care Centre	Unionville Home Society	4300 Highway 7	20 m
	Child Care Centre	Markham Montessori	6007 16th Avenue, Markham	60 m
	Child Care Centre	Little Readers Academy	9275 Highway 48, Markham	20 m
	Community Centre	Mount Joy Community Centre	6140 16th Avenue, Markham	10 m
	Community Landmark	Olive Branch Community Church	175 Anderson Avenue, Markham	10 m

In some instances, sensitive facilities that have open vistas looking beyond the rail corridor may experience a small adverse effect on the aesthetics of their viewshed from the OCS infrastructure. Given the relatively unimposing size of this infrastructure, the visual effects are not anticipated to be significant.

Mitigation Measures

The mitigation measures outlined in the respective sections/reports pertaining to Air Quality, Noise/Vibration, Visual/Aesthetics, and EMI/EMF will be adhered to and implemented during Detailed Design and construction.

4.8.7 Air Quality

4.8.7.1 Local Air Quality Impacts of Operations

The potential air quality impacts of trains and associated equipment/infrastructure are assessed in those segments of the corridors which are expected to experience an increase in diesel service relative to the 2015 (pre-project or baseline) levels, and which have sensitive receptors exposed to the rail corridor. The equipment activities include running or idling of GO Transit trains in revenue and non-revenue service along corridors, at stations and in layover or train storage facilities.

The assessments entail computer prediction of the emission and atmospheric dispersion of all major diesel train related air pollutants: particulate matter, oxides of nitrogen, carbon monoxide, benzene and benzo(a)pyrene. Predictions are made for a predictable worst-case scenario, which accounts for the planned ultimate train service levels, local meteorological conditions over the most recent 5 years for which data are available, and the 90th percentile of the background concentration of pollutants as measured at the NAPS monitoring station nearest to the project site.

In this assessment, the maximum potential ambient air concentrations of each assessed pollutant at each assessed representative receptor under each hour over a year period are added to the contribution of major local road traffic, local rail traffic by VIA and freight trains and background pollution to predict maximum potential ambient air pollutant concentrations at representative sensitive receptors. This provides an upper limit to potential exposure levels. Typical or average exposure levels are much lower than the maximum exposure levels.

The predicted concentrations are compared to provincial and national air quality criteria and standards to inform any consideration of mitigation.

4.8.7.2 Regional Air Quality and GHG Emission Impacts

Metrolinx projects make a contribution to regional air pollutant and greenhouse gas (GHG) emissions. Following the electrification of the GO Rail Network this contribution is expected to decrease, helping Ontario achieve better air quality and reducing GHG emissions. Apart from its direct contribution to air emissions, Metrolinx makes an even bigger contribution to the reduction of air emissions by helping Ontarians reduce the number of kilometres travelled in personal vehicles.

The regional assessment is limited to direct emissions arising from train operations. Future (year 2037) emissions are estimated for trains powered by diesel fuel and by electricity. Emissions associated with trains powered by electricity are those of electricity generating stations. These emissions are estimated for a set of future scenarios for electricity generation, which include the best, as well as the worst, scenarios with respect to emissions.

The total system-wide emissions over a year are estimated based on the ultimate train service schedule for 2037 and equipment usage. These emissions are compared with the corresponding estimated 2015 level as well as with Ontario's total and transportation emissions, to provide context for the estimates.

Electricity in Ontario is generated through a mix of renewable and non-renewable sources, namely nuclear, hydroelectric, natural gas (fossil fuel), biofuels, solar, and wind energy. Three electricity generation scenarios were analyzed to bracket the range of possible conditions. In the first scenario, electricity generation was represented by the average mix, in which 10% of the electricity generated comes from fossil fuels. The second scenario was represented by the mix of generating capacity in the province, of which 28% is associated with fossil fuels. In the final scenario, it was assumed that all electricity is generated by fossil fuel consumption – this is an upper bound scenario in terms of air contaminant emissions. The electricity demand of an electrified GO Transit system would vary widely throughout the day, from minimal demand overnight to peak demand during peak hours. Therefore, while on average 10% of Ontario's total electricity is provided by fossil fuel combustion, this percentage may increase during periods of peak electricity demand. Since it cannot be determined which emissions scenario applies at any time, these scenarios provide a bracket of the range of emissions that are likely to occur based on electricity demand.

Table 4-110 summarizes the total annual emissions in tonnes per year of NO_X, CO, $PM_{2.5}$, and CO_{2e} from Scenario 1, representing emissions from baseline GO transit rail activity included in the project scope. **Table 4-111** summarizes total annual emissions in tonnes per year from NO_X, CO, $PM_{2.5}$, and CO_{2e} for Scenario 2, representing both diesel and electric emissions from the future train service schedule. Emissions from the two scenarios are compared in Figures 3-6. In these figures, annual emissions from electric-powered trains were averaged between emissions estimated with and without the use of regenerative braking in trains. The figures indicate the following:

- For CO and CO_{2e}, the future scenario with electrification (at 2037 service levels) results in annual emissions that range from a slight reduction to an increase above the baseline scenario, depending on the mix of electricity generation sources;
- For NO_X and $PM_{2.5}$, the future scenario results in annual emissions that are lower than the baseline scenario, except in the case of the extreme upper bound electricity generation case where all electricity is generated using fossil fuel.

TABLE 4-110: ANNUAL EMISSIONS FROM SCENARIO 1 (2015 RAIL ACTIVITY) IN TONNES/YEAR

Pollutant	Annual Emissions from Scenario 1 (tonnes/year)
NO_X	1.51E+03
CO	6.12E+02
$PM_{2.5}$	4.77E+01
CO_{2e}	1.69E+05

TABLE 4-111: ANNUAL EMISSIONS FROM SCENARIO 2 (2037 RAIL ACTIVITY) IN TONNES/YEAR

Contaminant	Annual Emissions from Scenario 2					
	Average (10%) Electricity Supply from Fossil Fuels		Capacity (28% Supply from Fossil Fuels)		All (100%) Electricity Supply from Fossil Fuels	
	Without Regenerative Breaking	With Regenerative Braking	Without Regenerative Breaking	With Regenerative Braking	Without Regenerative Breaking	With Regenerative Braking
NOx	1.49E+03	1.48E+03	1.63E+03	1.61E+03	2.07E+03	2.02E+03
CO	6.28E+02	6.26E+02	7.00E+02	6.92E+02	9.43E+02	9.13E+02
$PM_{2.5}$	4.60E+01	4.59E+01	5.10E+01	5.04E+01	6.68E+01	6.49E+01
CO_{2e}	1.92E+05	1.90E+05	2.86E+05	2.76E+05	5.88E+05	5.51E+05

The projected increase in revenue train-kilometre travelled between Scenario 1 and Scenario 2 is approximately a 400% increase across the network. **Table 4-112** presents the percent change in emissions between Scenario 1 and Scenario 2 (showing the maximum change between NO_x, $PM_{2.5}$, and CO), compared to the change in revenue train-kilometres travelled. This table illustrates the proportional benefit of electrification, as the increase in train-kilometres travelled is significantly larger than the increase in emissions.

TABLE 4-112: PERCENT CHANGE IN TRAIN KILOMETRES TRAVELLED AND POLLUTANT EMISSIONS BETWEEN SCENARIO 1 AND SCENARIO 2

	Average (10%) Electricity Supply from Fossil Fuels		Capacity (28% Supply from Fossil Fuels)		All (100%) Electricity Supply from Fossil Fuels	
	Without Regenerative Braking	With Regenerative Braking	Without Regenerative Braking	With Regenerative Braking	Without Regenerative Braking	With Regenerative Braking
Train-Kilometres travelled	400%	400%	400%	400%	400%	400%
Pollutant	3%	2%	14%	13%	54%	49%
CO_{2e}	14%	12%	69%	63%	248%	226%

Table 4-113 to **Table 4-114** show how the change in emissions due to the future service levels with electrification will affect Ontario's total emissions from all sources, mobile sources, and rail transportation sources. These tables show that, in relation to province-wide emissions, the changes associated with the project are very small. In the average electricity generation scenario, a slight decrease in province-wide emissions occurs for NO_x and $PM_{2.5}$, and an increase occurs for CO and CO_{2e}. In the capacity-based generation scenario a slight decrease occurs for $PM_{2.5}$, while an increase occurs for other contaminants. In the 100% fossil fuel-based electricity generation scenario, a slight increase occurs for all contaminants.

TABLE 4-113: PERCENT CHANGE IN ANNUAL EMISSIONS AFTER ELECTRIFICATION, RELATIVE TO ONTARIO'S TOTAL RAIL EMISSIONS

Contaminant	Total Ontario Rail Transportation Source Emissions [1] [2] (tonnes/ year)	Percent Change in Emissions with Electrification (tonnes/year)					
		Average (10%) Electricity Supply from Fossil Fuels		Capacity (28% Supply from Fossil Fuels)		All (100%) Electricity Supply from Fossil Fuels	
		Without Regenerative Braking	With Regenerative Braking	Without Regenerative Braking	With Regenerative Braking	Without Regenerative Braking	With Regenerative Braking
NO_x	2.00E+04	-0.08%	-0.13%	0.62%	0.5%	2.8%	2.6%
CO	3.52E+03	0.46%	0.40%	2.5%	2.3%	9.4%	8.6%
$PM_{2.5}$	3.99E+02	-0.4%	-0.5%	0.8%	0.7%	4.8%	4.3%
CO_{2e}	1.85E+07	0.12%	0.11%	1%	0.6%	2.3%	2.1%

[1] Ontario emissions of NO_x, CO, $PM_{2.5}$ are for 2017, from: "Air Pollutants Emission Inventory Online Search", Government of Canada, 2019

[2] CO_{2e} emissions from rail transportation are for 2016, from: Natural Resources Canada, Comprehensive Energy Use Database, Transportation Sector, Table 16

TABLE 4-114: PERCENT CHANGE IN ANNUAL EMISSIONS AFTER ELECTRIFICATION, RELATIVE TO ONTARIO'S TOTAL MOBILE SOURCE EMISSIONS

Contaminant	Total Ontario Mobile Source Emissions [1] [2] (tonnes/ year)	Percent Change in Emissions with Electrification (tonnes/year)					
		Average (10%) Electricity Supply from Fossil Fuels		Capacity (28% Supply from Fossil Fuels)		All (100%) Electricity Supply from Fossil Fuels	
		Without Regenerative Braking	With Regenerative Braking	Without Regenerative Braking	With Regenerative Braking	Without Regenerative Braking	With Regenerative Braking
NO_X	2.09E+05	-0.01%	-0.01%	0.059%	0.05%	0.27%	0.25%
CO	9.89E+05	0.002%	0.001%	0.009%	0.008%	0.03%	0.03%
$PM_{2.5}$	8.70E+03	-0.02%	-0.02%	0.04%	0.03%	0.22%	0.20%
CO_{2e}	5.98E+07	0.04%	0.04%	0.20%	0.18%	0.70%	0.64%

[1] Ontario emissions of NO_X, CO, $PM_{2.5}$ are for 2017, from: "Air Pollutants Emission Inventory Online Search", Government of Canada, 2019
[2] CO_{2e} emissions from mobile sources are for 2016, from: Natural Resources Canada, Comprehensive Energy Use Database, Transportation Sector, Table 4

TABLE 4-115: PERCENT CHANGE IN ANNUAL EMISSIONS AFTER ELECTRIFICATION, RELATIVE TO ONTARIO'S TOTAL EMISSIONS FROM ALL SOURCES

Contaminant	Total Ontario Emissions [1] [2] (tonnes/ year)	Percent Change in Emissions with Electrification (tonnes/year)					
		Average (10%) Electricity Supply from Fossil Fuels		Capacity (28% Supply from Fossil Fuels)		All (100%) Electricity Supply from Fossil Fuels	
		Without Regenerative Braking	With Regenerative Braking	Without Regenerative Braking	With Regenerative Braking	Without Regenerative Braking	With Regenerative Braking
NO_X	3.00E+05	-0.01%	-0.01%	0.04%	0.03%	0.19%	0.17%
CO	1.39E+06	0.001%	0.001%	0.006%	0.006%	0.02%	0.02%
$PM_{2.5}$	2.70E+05	-0.001%	-0.001%	0.001%	0.001%	0.007%	0.006%
CO_{2e}	1.59E+08	0.014%	0.013%	0.07%	0.07%	0.26%	0.24%

[1] Ontario emissions of NO_X, CO, $PM_{2.5}$ are for 2017, from: "Air Pollutants Emission Inventory Online Search", Government of Canada, 2019
[2] Ontario emissions of CO_{2e} are for 2017, from: National Inventory Report 1990-2017: Greenhouse Gas Sources and Sinks in Canada

Emissions of CO and CO_{2e} will increase to various degrees compared to the baseline, depending on the electricity generation scenario. In all cases, the impact on province-wide emissions of air contaminants compared to the total for all provincial sources is small (<1%).

4.8.8 Noise and Vibration

The potential noise and vibration impacts of trains and associated equipment and facilities are assessed in all corridors and corridor segments, which are part of the GO Expansion Program. The assessed equipment activities include running or idling of GO Transit trains in revenue and non-revenue service along corridors, at stations and in layover or train storage facilities. The operational noise and vibration assessments for each corridor are detailed in Sections 4.2.2, 4.3.7, 4.4.7, 4.5.7, 4.6.7, and 4.7.7, along with mitigation recommendations specific to each corridor.

Environmental noise may cause annoyance, disturb sleep and other activities, and affect human health. If operations are projected to cause a 5-dB increase or greater in the average energy equivalent noise (referred to as “Leq”) relative to the existing noise level or the MECP objective of 55 dBA for daytime and 50 dBA for night-time, whichever is higher, then mitigation is required. The following mitigation measures related to noise barriers will be implemented on all corridors:

- Deploy the noise barriers defined in the Noise and Vibration Modelling Reports within **Appendix G.**
- Maintain noise barriers so as to ensure their continued effectiveness in noise reduction.
- If deviating from the assessments made in the Noise and Vibration Modelling Reports, comply with the noise impact and assessment criteria in the Metrolinx Guide for Noise and Vibration Assessment (2020).

The following mitigation measures will help address noise at the source:

- Deploy vehicle and track technology and related maintenance measures to maintain compliance with the noise and vibration exposure criteria defined below.

The following criteria will be used to determine the effectiveness of noise mitigation measures:

- Meet the following long-term day-time/ night-time maximum noise exposure objectives at all noise sensitive receptors across the system, where background noise levels allow their realization:
    - 10-year objective: 70/60 dBA
    - 20-year objective: 60/50 dBA
    - 25-year objective: 55/50 dBA
- Meet the airborne noise exposure criteria in the MOEE/GO Protocol for Noise and Vibration Assessment (1995).
- Meet the ground-borne (vibration induced) noise exposure criteria in the MOEE/GO Protocol for Noise and Vibration Assessment (1995).
- Meet any additional future criteria or guidance developed by regulatory agencies, as applicable.

The following monitoring recommendations will be implemented to ensure that noise mitigation measures continue to be operationally effective:

- Measure and document the Leq (16-hour) and Leq (8-hour) noise levels, under predictable worst-case conditions, at locations where new noise mitigation barriers have been provided per the 2020 noise and vibration studies and per the Metrolinx Enhanced Mitigation Program. Outdoor measurements will be carried out in accordance with MECP requirements and US FTA Report No. 0123, Transit Noise and Vibration Impact

Assessment Manual (2018). The primary purpose of these measurements is to ascertain the effectiveness of the implemented mitigation measure(s).

- Assess the condition and performance of locomotives, coaches, DMUs and EMUs with respect to noise emissions as part of maintenance to ensure continued compliance with manufacturer specifications.
- Assess the condition and performance of the rail tracks and switches with respect to noise as part of maintenance to ensure continued compliance with manufacturer specifications.

Vibration can cause annoyance, interfere with human activity and affect human health. It may also cause building damage. A change in vibration levels may occur where there are changes in track alignment, addition of new track, and changes to or addition of special track work. Vibration levels may also change with changes in rail vehicle specifications and operating conditions. The following vibration mitigation measures will be implemented on all corridors:

- Deploy mitigation recommended in the Noise and Vibration Modelling Reports within **Appendix G**. Review and update the vibration assessment during the design of new infrastructure at representative receptor locations to ensure compliance with the vibration exposure criteria in the MOEE/GO Protocol for Noise and Vibration Assessment (1995).

The following mitigation measures will help address vibration at the source:

- Deploy vehicle and track technology and related maintenance measures to maintain compliance with the noise and vibration exposure criteria defined below.

The following criteria will be used to determine the effectiveness of vibration mitigation measures:

- Meet the ground-borne vibration criteria in the MOEE/GO Protocol for Noise and Vibration Assessment (1995).

The following monitoring recommendations will be implemented to ensure that vibration mitigation measures continue to be operationally effective:

- Measure and document the vibration impacts, under predictable worst-case conditions, of each distinct type of GO Transit train consist operating in the corridor of interest at locations where the 2020 noise and vibration studies recommends mitigation of vibration impacts. Measurements will be carried out at or near representative vibration sensitive receptors in accordance with MECP requirements and US FTA Report No. 0123, Transit Noise and Vibration Impact Assessment Manual (2018). The primary purpose of these measurements is to ascertain the effectiveness of the implemented mitigation measure(s).
- Assess the condition and performance of locomotives, coaches, DMUs and EMUs with respect to vibration levels as part of maintenance to ensure continued compliance with manufacturer specifications
- Assess the condition and performance of the rail tracks and switches with respect to vibration levels as part of maintenance to ensure continued compliance with manufacturer specifications

In addition to the commitments outlined above, the following measures will be undertaken with respect to switch heaters, switches and crossovers:

- Noise impacts due to switch heaters on the rail network (USRC, LSW, LSE, BR & SV corridors) will be re-visited during the detail design stage where more details will be

available to allow more refined analysis of the switch heaters noise impacts. Metrolinx will investigate the feasibility of noise control measures when levels exceed 45 dBA in urban areas and 40 dBA in rural areas.

  - Metrolinx will ensure that the reference noise level of natural gas and electricity powered switch heaters are correctly and accurately measured. Metrolinx will also ensure that the assessment is based for a predictable worst-case scenario of switch heater operation. The assessment will use the applicable noise exposure criteria in the MECP document, NPC-300.

- During detailed design Metrolinx will undertake measurements at regular intervals to confirm the noise levels at crossovers and switches at a representative location on the GO rail network.

  - Metrolinx will carry out measurement of noise and vibration at 100, 200 and 300 m plus one additional measurement beyond 300 m (in each direction) from representative switches/crossovers and GO Transit trains. This will provide a more extensive data base for future assessments. The assessment criteria for these devices are those of the MOEE/GO Protocol for Noise and Vibration Assessment (1995).

4.8.9 Visual

There are no changes or additions to operations and maintenance practices beyond what has already been assessed as part of the 2017 TPAP.

4.8.10 Utilities

Once the system has been constructed and is operational, Utilities will require access to the relocated services for their own maintenance purposes. They may also require access to the rail corridors for construction of new services. All new utility crossings are already subject to a Metrolinx review process which will ensure compliance to the engineering standards.

Access to rail corridors is currently restricted for safety reasons. Once the corridors are electrified, even more stringent restrictions will be put in place to ensure safety to the public and to workers. One of these measures will include de-energizing the line for section in which any third-party maintenance or construction work will occur.

4.8.11 EMI & EMF

There are no changes or additions to operations and maintenance practices beyond what has already been assessed as part of the 2017 TPAP.

4.8.12 Stormwater Management

There are no changes or additions to operations and maintenance practices beyond what has already been assessed as part of the 2017 TPAP.

4.8.13 Groundwater and Wells

There are no changes or additions to operations and maintenance practices beyond what has already been assessed as part of the 2017 TPAP.

4.8.14 Climate Change and Sustainability

This section outlines how climate change (Section 4.8.14.1) and sustainability (Section 4.8.14.2) considerations were taken into account in the environmental assessment and design of the proposed electrification infrastructure associated with the GO Rail Network Electrification EPR Addendum. Section 4.8.14.1 describes how the Transit Project Assessment Process (TPAP) incorporates the Ministry of the Environment, Conservation and Parks (MECP)'s guidance for considering climate change in environmental assessments, with a focus on climate change mitigation and adaptation. Section 4.8.14.2 highlights some of the broader sustainability initiatives that Metrolinx is currently undertaking or has planned in relation to the construction and operation of new facilities, with the goal of improving environmental and social outcomes. Section 4.8.14.3 summarizes how the design considerations, mitigation measures, and other initiatives outlined in Sections 4.8.14.1 and 4.8.14.2 are helping to meet the MECP's expectations, as well as the sustainability goals outlined in Metrolinx's Sustainability Strategy 2015-2020 (Metrolinx, 2016). The next iteration of Metrolinx's Sustainability Plan (2021-2026) was in development at the time of this EPR Addendum's preparation.

The requirements and recommendations included in this Section must be applied with the consideration that the OCS infrastructure at proposed layover facilities and storage yard are industrial facilities and will not serve GO customers. Therefore, some of Metrolinx's climate change and sustainability requirements may not apply to the design and construction of the proposed infrastructure under this Project. The three proposed facilities (Walkers Line Layover , Midland Layover, and Unionville Storage Yard) and associated OCS that is subject to this addendum are infrastructure components that are critical to the Metrolinx GO Rail Network and the GO Expansion Program and efforts will be made to ensure that climate change mitigation and adaptation and Sustainability measures are applied to the maximum extent possible. Metrolinx is continuing to refine its climate change and sustainability requirements and approach and additional sustainability measures specific to the GO Expansion Program infrastructure will be incorporated at a future date.

4.8.14.1 Climate Change

The Intergovernmental Panel on Climate Change (IPPC) defines climate change as:

> *"…a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use."*
> *(Intergovernmental Panel on Climate Change, 2014)*

The term "climate change" can apply to any major variation in temperature, wind patterns or precipitation that occurs over time. Changes in the composition of the atmosphere are resulting in processes that alter global temperature and precipitation and are affecting local weather patterns. These processes are leading to increased occurrence of extreme weather events such as floods, droughts, ice storms and heat waves across the Greater Toronto and Hamilton Area (GTHA) (Metrolinx, 2017).

To mitigate climate change and its effects on the natural and built environments, government agencies at all levels have developed strategies and guidelines to reduce greenhouse gas (GHG) emissions into the atmosphere. Government agencies are also implementing measures that promote resiliency to a changing climate. Consistent with these strategies and guidelines, the planning and design of this Project will consider both climate change *mitigation* (i.e.,

minimizing effects of a project on climate change) and *adaptation* (i.e., resilience of a project to future climatic conditions).

Section 4.8.14.1.1 outlines the policy context which guides how climate change has been considered in the planning of this Project. Sections 4.8.14.1.2 (mitigation) and 4.8.14.1.3 (adaptation) describe how these considerations are being implemented in project planning and design. Given the relatively small effects of the transit project on climate change, and Metrolinx's extensive existing guidance on how to build and operate the infrastructure considering future extreme weather events, reference to existing climate change strategies and policies was judged to be sufficient in considering climate change in the EPR Addendum.

4.8.14.1.1 Policy Context

4.8.14.1.1.1 Government of Ontario

The Government of Ontario has committed to reducing GHG emissions to 30% below the 2005 levels by 2030 (i.e., 143 megatonnes of carbon dioxide equivalent (CO_2e) by 2030) (Government of Ontario 2018).

The *Infrastructure for Jobs and Prosperity Act*, *2015* (Province of Ontario, 2015) indicates that infrastructure should be planned to mitigate effects on climate change and be designed to consider climate change adaptation. Specifically, Section 3.11 of this Act states that:

> *"Infrastructure planning and investment should minimize the impact of infrastructure on the environment and respect and help maintain ecological and biological diversity, and infrastructure should be designed to be resilient to the effects of climate change."*

The 2020 Provincial Policy Statement (PPS) (Ministry of Municipal Affairs and Housing, 2020) issued under the *Planning Act* advises on the need to consider reducing GHG emissions and reducing the potential risk of climate change-related events like droughts or intense precipitation. It encourages green infrastructure and strengthened stormwater management requirements; energy conservation and efficiency; reduced GHG emissions; climate change adaptation (e.g., tree cover for shade and for carbon sequestration); and consideration of the increased risk associated with natural hazards (e.g., flooding due to severe weather).

4.8.14.1.1.1.1 Applicability to the Project

Improving the public transit network can reduce traffic congestion and reduce the need for new road infrastructure, as well as reduce carbon emissions and air quality concerns associated with automobile use, contributing to reductions in GHG emission and helping to achieve provincial targets. Metrolinx is working in alignment with the intent of the *Infrastructure for Jobs and Prosperity Act*, *2015* in the planning and design of the Project.

Since infrastructure proposed by the project have life spans that have the potential to face significant climatic changes based on conservative climate projections , there is a need to consider both the operational impacts to climate change, as well as how the Project will be affected by future climate change-related events such as droughts or intense precipitation. This includes consideration of most of the aspects highlighted in the PPS, including green infrastructure; stormwater management; energy conservation and efficiency; GHG emissions; vegetation/carbon sequestration; and resiliency to natural hazards such as flooding. Specific measures related to these aspects are further discussed in Sections 4.8.14.1.2 and 4.8.14.1.3.

4.8.14.1.1.2 Ministry of the Environment, Conservation and Parks (MECP)

The MECP has prepared a guide titled *Considering Climate Change in the Environmental Assessment Process* (The Ministry of Environment , Conservation, and Parks, 2017), to describe how environmental assessment processes shall incorporate consideration of climate change impacts, including:

- The effects of a project on climate change;
- The effects of climate change on a project; and
- Various means of identifying and minimizing negative effects during project design.

Considering climate change in accordance with the guide is meant to result in a project that is more resilient to future changes in climate and helps maintain the ecological integrity of the local environment in the face of a changing climate.

The guide states that proponents should take into account climate change mitigation and adaptation during both the assessment of alternatives to the undertaking and alternative methods of implementing the undertaking. Specific to transit projects assessed under the TPAP, the guide advises that the consideration of climate change should be scaled to the significance of the project's potential environmental effects, and that evaluation can be qualitative and/or quantitative.

4.8.14.1.1.2.1 Applicability to the Project

The TPAP starts with a selected transit project. *O. Reg. 231/08* does not require proponents to look at the rationale and planning alternatives or alternative solutions to public transit or the rationale and planning alternatives or alternative solutions to the particular transit project (MOECC 2014). The climate change assessment contained in this EPR Addendum focuses on the various design and mitigation measures that will support climate change mitigation and adaptation during operations of the Project.

Since the Project will be operational for the foreseeable future, it will likely be affected by future climate change-related events such as droughts or intense precipitation. As a result, designs, construction and operations should consider the potential for these future events. The Project will continue to take climate change considerations into account as the design progresses beyond the EA phase as the GO Rail Network Electrification TPAP and associated addendum is based on the preferred reference concept design.

Table 4-116 outlines how climate change was considered in this Project. Each of the areas considered is described in greater detail in Sections 4.8.14.1.2 and 4.8.14.1.3.

TABLE 4-116: CONSIDERATION OF CLIMATE CHANGE IN THE PRE-TPAP AND TPAP PHASES

Consideration	Project Phase	Areas considered	Type of Evaluation
Effects of the Project on climate change (mitigation)	Pre-TPAP, detailed design, construction, operations	• Planning for transit	• Qualitative
		• GHG emissions	• Quantitative
		• Vegetation removal and compensation	• Qualitative
		• Energy consumption and emissions	• Qualitative
		• Environmental Management System	• Qualitative
		• Air temperature (building materials, solar infiltration, shade, urban heat island effect)	• Qualitative

Consideration	Project Phase	Areas considered	Type of Evaluation
Effects of climate change on the Project (adaptation)	Detailed design, construction, operations	• Precipitation (stormwater management, low impact development, erosion and sediment control)	• Qualitative
		• Drought (water reuse/reduction, vegetation)	• Qualitative

Further, **Table 4-117** outlines how the primary expectations for proponents when considering climate change according to the MECP's guide (as indicated by "should" statements in the guide) have been addressed in the EPR Addendum.

TABLE 4-117: CONSIDERATION OF CLIMATE CHANGE IN THE EPR ADDENDUM

Recommendation	Section(s)
The ministry expects proponents to take into account: • The project's expected production of greenhouse gas emissions and effects on carbon sinks (climate change mitigation) • Resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation)	• Section 4.8.14.1.2.2 (greenhouse gas emissions) • Section 4.8.14.1.2.3 (effects on carbon sinks) • Section 4.8.14.1.3 (climate change adaptation)
The proponent should also include a discrete statement in their study report detailing how climate change was considered in the environmental assessment	Section 4.8.14.1.1.2.1 **Table 4-116**
Proponents of natural resource related projects should consult Appendix B for treatment of carbon stocks as sinks versus sources	The transit project is not natural resource related, so this is not applicable
Proponents should include evaluation criteria, such as greenhouse gas emissions and effects on carbon sinks, in the assessment of alternatives and alternative methods	The EPR Addendum does not include an assessment of alternatives or alternative methods, so this is not applicable
In concluding an environmental assessment study, the proponent should also include a statement in their study report about how climate change was considered in the environmental assessment and how the preferred alternative (project) is expected to perform with climate change considered	Section 4.8.14.1.3
Proponents should include evaluation criteria such as extreme weather events in their screening of alternatives, and alternative methods	The EPR Addendum does not include an assessment of alternatives or alternative methods, so this is not applicable
Proponents should also include in their study report, a statement about how climate change was considered in the environmental assessment, specifically in relation to the preferred alternative (project)	The EPR Addendum does not include an assessment of alternatives or alternative methods, so this is not applicable
All climate parameters with potential to interact with a project should be defined and considered at a screening level to fully understand which interactions pose higher risk	Section 4.8.14.1.3, **Table 4-118**
Proponents should also document any uncertainty related to either downscaling climate change projections	Metrolinx is moving towards using downscaling projections as described in its *Planning for Resiliency* report (Metrolinx, 2017) to inform decisions regarding

Recommendation	Section(s)
to specific sites, or expected effects to the environment or project, within the environmental assessment	planning, construction and operations of infrastructure. This considers adaptation to climate change across all infrastructure assets.
Considering climate change in the terms of reference for an environmental assessment should commit the proponent to considering climate change effects in related project studies prepared in support of the environmental assessment report	The EPR Addendum does not include a terms of reference, so this is not applicable
Considering climate change in an environmental assessment should result in the proponent refining and documenting measures for dealing with climate change effects as the undertaking moves toward implementation stage. Examples could include adapted design or maintenance schedules, additional studies, and revised operating procedures	Section 4.8.14.2.1
Considering climate change in streamlined environmental assessment processes and studies could result in the inclusion of a commitment on how the proponent will implement climate change adaptation and mitigation measures during the detailed design phase of any given project	Section 6.18
Proponents should consider whether making reference to existing climate change strategies or policies alone is sufficient as a consideration of climate change, or whether a more detailed consideration of climate change should be carried out when conducting project-specific environmental assessment studies. Documentation of the results of this consideration should be included as part of project reporting	Section 4.8.14

4.8.14.1.1.3 Metrolinx

Metrolinx's Regional Transportation Plan (RTP) 2041 (Metrolinx, 2018) outlines the long-term projects, plans, and activities Metrolinx will deliver to support reduction of Ontario's overall GHG emissions by promoting a shift from single occupant vehicles to more energy-efficient options such as public transit, walking, cycling, carpooling, and teleworking.

Metrolinx is committed to ensuring that the existing transit network and new layover and storage facilities will have a low-carbon footprint[85] and contribute to a clean and healthy environment for future generations (Metrolinx, 2016). Metrolinx has outlined key climate change goals in its Sustainability Strategy (2015 – 2020) (Metrolinx, 2016). The Sustainability Strategy addresses climate change through five goals, which are:

- Goal 1: Become Climate Resilient – Accelerate and intensify our efforts to implement a climate adaptation and resilience program to manage and mitigate climate change risks.

[85] A carbon footprint is the total greenhouse gas emissions attributed to a body (e.g., person, facility, or event) expressed as carbon dioxide equivalent (CO_2e). CO_2e is a standard unit for measuring carbon footprints, as a way to express the impact of each different greenhouse gas in terms of the amount of CO_2 that would create the same amount of warming.

- Goal 2: Reduce Energy Use and Emissions – Adopt processes, programs and technologies that allow us to effectively track, monitor and reduce our energy consumption, and carbon and air emissions.
- Goal 3: Integrate Sustainability in our Supply Chain – Minimize the impact associated with the use, extraction, processing, transport, maintenance, and disposal of materials and integrate sustainability criteria into our vendor management decisions. This goal extends to consideration of embodied carbon (i.e., the carbon dioxide emitted during the manufacture, transport and construction of materials, together with end of life emissions).
- Goal 4: Minimize Impacts on Ecosystems – Consider the impact of infrastructure and services on ecosystems and ecosystem services and make best efforts to manage, preserve and protect. This includes the consideration of infrastructure projects within the broader context of ecosystems and ecological values, including watershed/stormwater management considerations.
- Goal 5: Enhance Community Responsibility – Leverage our significant investment in the region to create a lasting legacy for our communities, and work closely with communities to create economic and social value.

For GO stations, terminals, and facilities, including this Project, Metrolinx generally requires that contractors adhere to the *GO Design Requirements Manual* (DRM) (Metrolinx, 2020) and other applicable Metrolinx design standards, including the Metrolinx Sustainable Design Standard. The DRM outlines the Guiding Principles and technical details for designing and building GO station infrastructure (Off Corridor (OffCorr) infrastructure). The DRM covers a number of areas directly and indirectly related to climate change adaptation and mitigation, including stormwater management, energy consumption and emissions, and vegetation. Effort will be made to apply DRM requirements to new layover and storage facilities (GO Expansion Program infrastructure) and associated infrastructure components to the maximum extent possible. The Metrolinx Sustainable Design Standard outlines specific design requirements and reporting direction for designing and building projects with capital costs over $100 million or otherwise required by Metrolinx. The Sustainable Design Standard covers a number of areas related to climate vulnerability and risk assessments and stormwater management. Effort will be made to apply Sustainable Design Standard requirements to new layover and storage facilities (GO Expansion Program infrastructure) and associated infrastructure components to the maximum extent possible.

4.8.14.1.1.3.1 Applicability to the Transit Project

Of the goals identified above, Goals 1, 2 and 4 align most directly with climate change adaptation and mitigation as described in the MECP's guide. Goal 1 is focused on adaptation, and has been considered in various aspects of new facilities design. Goal 2 relates to minimizing emissions during operations (mitigation), while Goal 4 focuses on minimizing impacts to ecosystems both during construction and operations (adaptation and mitigation). The following sections outline how project planning and design have been undertaken with regard to climate change mitigation and adaptation.

Goals 3 and 5 more broadly speak to how the construction and operations of the Project can minimize environmental impacts as well as maximize social value. These goals are discussed in Section 4.8.14.2.

4.8.14.1.2 Considering the Effects of the Project on Climate Change (Climate Change Mitigation)

As indicated in **Table 4-117**, the effects of the Project on climate change (mitigation) have been evaluated both quantitatively (for GHG emissions) and qualitatively (for transit planning, vegetation compensation/revegetation, energy consumption/emissions and environmental management systems).

4.8.14.1.2.1 Planning for Transit

Public transportation is a beneficial service that can reduce traffic congestion, the need for new road infrastructure, and carbon emissions and air quality concerns associated with automobile use. Improvements to transit will decrease average transit trip times in the GTHA, even with an increasing population, leading to more people using public transportation and fewer vehicle-kilometres travelled in congested conditions. This reduction in congestion, when combined with expected improvements in automobile fuel efficiency, will result in a decrease in per capita GHG emissions from automobile trips (Metrolinx, 2018).

The Project has been identified for implementation through a comprehensive, iterative planning process for new infrastructure in the GTHA. Business case analysis for the GO Expansion Program has indicated that benefits (travel time savings for new customers, auto usage decrease, increased service) outweigh impacts (delays to upstream passengers, auto usage increase). It is anticipated that the introduction of new tracks and facilities proposed as part of the NT&F TPAP, which requires electrification will assist in implementing the planned service increases and thus increasing the use of public transportation, thereby decreasing congestion and improving per capita GHG emissions.

4.8.14.1.2.2 Greenhouse Gas Emissions

GHG/Climate Change analyses were undertaken as part of the Local Air Quality Assessment Studies for each of the corridors that will see an increase in diesel service, to evaluate the local impacts to air quality (see **Appendix F**). A Regional Air Quality Assessment Study (as described in 4.8.7.2) was also produced to identify the regional impacts associated with different electricity generation scenarios for the future rail service plan, to provide a complete comparison between the current diesel and future diesel/electric train service. The successful Project consortium will be required to establish a baseline of GHG emissions for the Project once operational and monitor energy use of all forms for future opportunities for reduction (this should be done using a three-year baseline in order to establish a normalization of energy data). An accurate picture of energy savings can be developed in accordance with the new Metrolinx GHG Corporate Reporting process and standards.

Greenhouse gas emissions were not included in the construction air quality investigation as a detailed Construction AQMP will be prepared by the Contractor, that will include specific air quality objectives as outlined in the Metrolinx Environmental Guide of Air Quality and Greenhouse Gas Emissions Assessment (Metrolinx 2019a).

4.8.14.1.2.3 Vegetation Removal and Compensation

As noted in the Natural Environment Assessment (**Appendix A** in Section 4 of this EPR Addendum), the construction of the new facilities will require the removal of trees and vegetation, which will result in a temporary loss of an existing carbon sink within the local environment.

Metrolinx has established a Vegetation Guideline for GO Expansion projects that will be applied to the Project, and vegetation or trees that are removed will be compensated for in accordance with the provisions of this protocol, as follows:

- **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 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 regulated areas 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:** Options for the end use of trees removed from Metrolinx property (e.g., reuse/recycling options) will be developed.

Compensation of disturbed areas will take place as soon as possible. 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.

Additionally, the Metrolinx DRM requires that plant materials suitable to the growing environment at project sites be selected for vegetation/revegetation, and that species (native or non-native) must be hardy, drought and salt-tolerant, and resistant to the stresses of compacted soils and weather exposure.

4.8.14.1.2.4 Energy Consumption and Emissions

To lower the energy consumption and carbon footprint of the proposed layover facilities and storage yard, the successful Project consortium will be required to explore (sequentially) the following groups of methods for applicability and feasibility: energy efficiency, energy conservation and recovery, and energy harvesting. Examples include:

- **Energy efficiency** – use premium efficiency motors or other equipment; applying passive means of reducing energy where it does not conflict with other operational design requirements, including the use of building materials with high-insulation/energy efficiency value where possible.
- **Energy conservation and recovery** – employ regenerative braking systems to capture energy from braking vehicles (already proposed for the GO Rail Network Electrification TPAP (2017)); and
- **Energy harvesting** – consider incorporating solar thermal systems, passive solar systems and/or ground source heat pump systems to replace or augment fuel-based systems

These and other considerations will be developed into an Energy and Emissions Management Plan that will include targets and programs to promote continuous reduction of energy and emissions (both GHG and criteria air contaminant (CAC)).

4.8.14.1.2.5 Environmental Management System

Metrolinx has developed an Environmental Management System (Env.MS), which outlines an organization-wide framework for pursuing environmental compliance and continuous environmental improvements. The Env.MS, which follows the ISO 14001 standard[86], is currently expanding from its operational focus to encompass additional environmental responsibility and stewardship considerations. The overall objectives of the Metrolinx Sustainability Strategy are reflected in the Env.MS with respect to climate change mitigation, energy use reduction, and air emissions (i.e., GHG) management. Both the construction and operation of the Project will be subject to Metrolinx's Env.MS.

The Env.MS includes:

- Environmental standards for managing chemicals, solid waste, regulated waste, bulk storage and fuel handling, water use and disposal, energy use, air emissions, ozone-depleting substances, designated substances and hazardous materials, snow and ice, and wildlife and vegetation;
- Compliance audits and corrective action planning;
- Environmental reporting metrics;
- Monitoring of environmental impacts; and
- Monitoring of energy use and air emissions.

Through the use of standards, audits, and reporting, the Env.MS will promote ongoing compliance with regulatory and corporate environmental requirements throughout construction and operations of the Project. Additionally, monitoring of impacts will support ecosystem resilience, consistent with overall Metrolinx sustainability objectives.

Additionally, a Sustainability Plan for the Project will be developed by the successful Project consortium, and will be aligned with the EnvMS. Once developed, this Sustainability Plan will be incorporated into the EnvMS to help ensure that the Project maintains environmental compliance and continuous environmental improvement. The Sustainability Plan is described in Section 4.8.14.2.1.

4.8.14.1.3 Considering Potential Effects of Climate Change on the Project (Climate Change Adaptation)

It is recognized that climate change is already underway and can be anticipated to affect the construction and operations of the Project. There is general agreement that the Great Lakes Basin will see increases in temperature, precipitation, drought, wind gust events, and freezing rain by the end of this century; however, the level of confidence and quality of supporting evidence for these projections vary considerably (Metrolinx, 2017). **Table 4-118** shows changing climate parameters and predictions for climate change.

[86] ISO 14001 is an international standard that outlines specific requirements for an effective environmental management system. The standard provides a framework suitable for use by an organization, and covers topics such as: Context of the organization, Leadership, Planning, Support, Operation, Performance evaluation, and Improvement.

TABLE 4-118: METROLINX CLIMATE PARAMETERS LIST: PROBABILITY AND SCORE

Climate Parameter	Threshold	Annual Probability		Prob. Of Occurrence for Study Period (2015-2050)	PIEVC Scoring		
		Historical	2050s		Annual: Historical	Annual: 2050s	Study Period (35 year)
Extreme temperatures	40°C	~0.01 per year	1-7 days per year	~100%	1	7	7
	32°C	6.5 days per year	27.5 days per year	100%	7	7	7
	-30°C	0.05 days per year	<0.01 days per year	<70%	2	0-1	5-6
	-23°C	1.1days per year	0.1 days per year	100%	7	3	7
Temperature range	60°C in one year	0.1 days per year	<0.01 events per year	<90%	3	0-1	6
Reduced Visibility (e.g. fog, blowing snow)	400 m (or ¼ mile)	49 hours per year, 15.1 days per year	Strong trend ↓, stable recent period	100%	7	6-7	7
	200 m	33 hours per year, 11.9 days per year	Strong trend ↓, stable recent period	100%	7	6-7	7
Frost Penetration	1.2 m or below	0.17 per year	Trend ↓ but some conflicting factors	>90%	4	3	6-7
High Winds (Gusts)	90 km/h	2 per year	>2.5 per year	100%	7	7	7
	120 km/h	0.05 days per year	Likely ↑	~85% or higher	2	2	6-7
Tornadoes	EF1 +	1-in-6,000	Unknown	~0.6%	0	0	0-1
Overland Flood/Heavy Rainfall	≥25 mm in 2 hours	~0.8 events per year	Very likely ↑	100%	6	6	7
	≥60 mm in 2 hours	< 0.03 events or less per year	Very likely ↑	~70%	1-2	2	6
Freezing Rain	≥ 10 mm	~0.2 days per year	~0.3 days per year	~100%	4	4-5	7
	≥ 25 mm	0.06 days per year	>0.09 days per year	>95%	2	3	7
Snow	Blowing snow	7.8 days per year	Trends not significant to scoring	100%	7	7	7
	≥20 cm in one day	0.1 days per year	Conflicting trends, likely remaining similar	>95%	3	3	6-7

Climate Parameter	Threshold	Annual Probability		Prob. Of Occurrence for Study Period (2015-2050)	PIEVC Scoring		
		Historical	2050s		Annual: Historical	Annual: 2050s	Study Period (35 year)
	Design Loads (snow-water equivalent)	184 mm (Willowbrook/Port Credit)	No observed trend, some factors indicate ↑	~20%	1	1-2	4
		153 mm (Streetsville)		~40%	1	1-2	5
		133 mm (Oakville)		~40%	1	1-2	5
Hail (Mississauga area example)	"Golf ball" / 45 mm or larger	0.07 per year	Unknown	>90%	2-3	Unknown	6
Horizontal Rain	Gusting 50 km/h + >25 mm rain	1.8 days per year	Slight trend ↑	100%	7	7	7
Lightning	Direct strikes	~0.3% per year	Likely ↑	>99%	1	Unknown	3

To focus the consideration of effects of climate change on the Project, only those themes where there is high or medium agreement on data (i.e., rows in **Table 4-118** that are not greyed out) are addressed in the sections below, for both the construction and operations phases of the Project.

4.8.14.1.3.1 Air Temperature

Recognizing increasing summer temperatures, the DRM considers reducing effects of extreme heat on all Metrolinx assets. It should be noted that DRM requirements may not be applicable for all of the proposed layover facilities and storage yard as they will consist of different infrastructure components. The DRM indicates that new GO infrastructure designs will:

- Consider building material selection to limit absorption of solar radiation.
- Automate building systems to reduce solar infiltration (i.e. automatic window blinds) or provide manual alternatives.
- Maximize shade along pedestrian routes and in parking areas.
- Mitigate the urban heat island effect through plantings, selection of building materials and proactive shade management.

4.8.14.1.3.2 Precipitation

Precipitation, whether it is rainfall, snowfall, or other forms of frozen/liquid water, is the key climate and weather-related variable of concern in stormwater management (SWM). As a result of climate change, storm events are predicted to become more intense in the GTHA, which can result in larger volumes of precipitation at one time (see (McDermid, et al., 2015) as outlined in **Table 4-118**).

The SWM design for the Project will consider the drainage and SWM objectives of the MECP Stormwater Management Planning and Design Manual (2003), MTO Drainage Management Manual (2008), TRCA Stormwater Management Criteria (2012), Low Impact Development

Guidelines for Storm Water Management Design (2010), and the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering (2017). This will be supplemented by current guidance such as the runoff volume control targets for Ontario recommended to MECP (Aquafor Beech Ltd. and Earthfx Inc., 2016) from local municipalities and Conservation Authorities.

Stormceptors[87] and stormwater management features must be sized appropriately to manage predicted future scenario flows and sediment loading (i.e. winter and spring).

4.8.14.1.3.2.1 Intensity-Duration-Frequency Curves

A detailed SWM Plan will be developed prior to the construction phase of the Project so that runoff from rainfall is controlled based on predicted future scenarios, to promote climate resilience. These scenarios will be identified by using the most up-to-date precipitation intensity-duration-frequency (IDF) curves available.

IDF curves are graphical representations of the amount of water that falls within a given period of time in catchment areas and are used by decision makers to plan and design infrastructure to withstand severe weather impacts (Office of the Auditor General of Canada, 2016). Current SWM practices include the use of IDF data and design storm distributions (e.g., Chicago Storm, Hurricane Hazel), as well as 2-year through to 100-year[88] storm events.

Designing the SWM systems for the Project based on up-to-date IDF curves will lead to:

- Reduced ongoing operation and maintenance requirements; and,
- Minimized impacts on surrounding ecosystems, since SWM systems will be designed to ensure that runoff from rainfall is controlled mostly on-site.

4.8.14.1.3.2.2 Low-Impact Development

The SWM designs for the Project will consider implementation of Low Impact Development (LID) measures. LID is a SWM strategy that seeks to mitigate the impacts of increased runoff and stormwater pollution by managing runoff as close to its source as possible (i.e., in the vicinity of the proposed infrastructure). Compared to conventional design, LID measures allow for increased infiltration of stormwater through built infrastructure, which would be beneficial for managing stormwater should storms increase in intensity. LID design strategies include measures that can effectively remove nutrients, pathogens and metals from runoff, and reduce the volume and intensity of stormwater flows (Sustainable Technologies Evaluation Program (STEP), 2019).

The design of the LID measures will consider the guidance provided in the *Low Impact Development Stormwater Management Planning And Design Guide* (Sustainable Technologies Evaluation Program (STEP), 2019). Over the long-term operation of the Project, SWM facilities including LID measures will be monitored to ensure that these features are maintained appropriately and repaired where and when required.

[87] A stormceptor is an oil grit separator/hydrodynamic separator, designed to protect waterways from hazardous material spills and stormwater pollution.
[88] Storm even frequency is used to simplify the definition of a rainfall event that statistically has a chance of occurring once within the given time period (e.g., a 100-year storm has a 1 in 100 (1%) probability of occurring in any given year.

4.8.14.1.3.2.3 Erosion and Sediment Control Measures

An increase in storm intensity, which is projected as a result of climate change (see **Table 4-118**), can make erosion and sedimentation more likely, especially during construction. Erosion and Sediment Control (ESC) measures as described in **Appendix J** in Section 4 of the EPR Addendum, including the development of an ESC Plan, will be implemented during the construction phase of the Project to ensure stormwater runoff is controlled and sediment is prevented from entering sewers and watercourses. The ESC Plan will include consideration of the Erosion and Sediment Control Guide for Urban Construction (TRCA, 2019) and OPSS 805 (Erosion and Sediment Control Measures). Installation and monitoring of appropriate ESC measures will help mitigate potential effects of climate change on the Project.

4.8.14.1.3.2.4 Drought

As summarized in **Table 4-118**, the Great Lakes Basin is projected to see increases in frequency and extent of drought. Facilities design will include consideration of water conservation measures to reduce effects of drought on the Project, such as:

- Metering indoor and outdoor water use to better track and manage the impacts of extended droughts on operations and landscape plantings.
- Using collected rainwater for plant irrigation.
- Using water conserving systems to reduce consumption.
- Planting drought resistant vegetation.

4.8.14.2 Sustainability

Metrolinx's Sustainability Strategy (Metrolinx, 2016) is rooted in the three tenets of sustainable development, as outlined by the Bruntland Commission in 1987. These tenets are:

- Development that meets the needs of the present without compromising the ability of future generations to meet their needs;
- Development that considers the inherent interrelationships between our environment, the people living in it, and the economy within which we interact; and
- Development that relies on multiple perspectives to understand the complexity of issues and to garner the support needed to implement initiatives to advance development.

Sustainability in the context of the Project focuses not only on a reduction of impacts, as is typical in environmental assessment, but also on the enhancement of environmental and social outcomes. The sections below outline initiatives being undertaken by Metrolinx that seek to minimize impacts and/or improve environmental and social outcomes of new layover facilities and storage yard, and are not directly related to the climate change evaluation in Sections 4.8.14.1.2 and 4.8.14.1.3.

4.8.14.2.1 Sustainability Plan

The procurement documents for the Project will include a requirement for the successful Project consortium to develop a Sustainability Plan, which will be in alignment with the Environmental Management System described above. The Sustainability Plan will align with Metrolinx's Sustainability Strategy (Metrolinx, 2016). Among other items, the Sustainability Plan will include:

Targets which will support achievement of the sustainability goals (see Section above);

- Measurement and monitoring methods, parameters and metrics for evaluating achievement of sustainability targets;
- Plans and commitments to:
  - Integrate sustainability criteria into the procurement of goods and services;
  - Provide programs that support employment and training, mental health and local economic development;
  - Identify and mitigate climate change risks and vulnerabilities;
  - Reduce energy consumption and use;
  - Implement water conservation practices and set targets for water conservation; and
  - Reduce waste and increase waste diversion.
- The framework for decision-making, including risk management, relating to sustainable design and practices; and
- The methods, tools and documentation format for reporting on sustainability achievements and compliance with the Sustainability Plan, via a Sustainability Annual Report.

4.8.14.2.2 Salt Reduction Initiatives

As part of regular winter maintenance, Metrolinx applies rock salt to remove ice and snow from GO stations, facilities, platforms, roadways and parking lots so that trains can run efficiently and safely.

Rock salt can enter the environment at salt storage and snow disposal sites, as well as through runoff and splash from roadways and parking lots. While other compounds have been investigated for use at Metrolinx facilities, these have not proven to be as efficient or cost-effective as rock salt. High releases of road salts have an adverse effect on freshwater ecosystems, soil, vegetation and wildlife (Government of Canada, 2017)).

To reduce rock salt use, Metrolinx has developed a Winter Maintenance Plan in partnership with the University of Waterloo that requires winter maintenance contractors to complete “Smart About Salt” certification from the Smart About Salt Council. The certification includes the use of a mobile application that provides workers with salt recommendations based on weather forecast, temperature, and return-to-bare-pavement parameters.

In 2017, Metrolinx updated 80% of its winter maintenance contracts with best practice techniques including the use of direct liquid application and pre-wetting techniques, maintaining properly calibrated equipment, and use of low-chloride salt alternatives in environmentally sensitive areas. Metrolinx also implemented changes in contracts to ensure data collection on salt use. These requirements will be included in procurement documents for the Project.

Metrolinx is also developing a salt management strategy, with the aim of minimizing and managing the use of road salt for operations. This strategy will assess the impact of salt use and evaluate possible alternatives for future operations.

4.8.14.2.3 Light, Noise and Vibration Impacts

Recognizing the impacts that light, noise, and vibration can have on GO staff and surrounding communities, Metrolinx has included requirements in the DRM that new infrastructure shall be designed where applicable to minimize unwanted light, noise, and vibration so as to not interfere with GO Transit operations as well as to protect adjacent properties where necessary. For

example, the use of sensors and timers for lights will be provided where appropriate, and light fixtures will be designed to limit glare and uplight.

4.8.14.2.4 Community Benefits

Metrolinx recognizes that its major infrastructure investments should also provide benefits for the communities in which it operates, including employment, training, apprenticeship, and local supplier and social procurement opportunities where possible. Metrolinx developed a Community Benefits Framework that serves as a template for Metrolinx's Toronto transit projects starting with the Eglinton Crosstown Light Rail Transit (LRT) project. Outlined in the framework is the approach to community benefits programs which are intended to be inclusive, accessible, transparent and collaborative.

For the construction of the Project, Metrolinx is committed to developing and implementing a Community Benefits Agreement based on the Community Benefits Framework. The Community Benefits Agreement may include:

- Opportunities for local workforce development in project construction;
- Procurement from local businesses and social enterprises;
- Opportunities to build partnerships with local community organizations; and
- Engagement with educational programs to further innovation and sustainability objectives.

4.8.14.2.5 Waste Management and Reduction

Waste will be managed throughout both the construction and operations of the Project. The Project will aim to reduce disposal of construction waste in landfills and incineration facilities by recovering, reusing, and recycling materials. To achieve this, the successful Project consortium will be required to develop and implement a Construction and Demolition Waste Management Plan, which will document opportunities for reuse and recycling of materials during construction, establish waste diversion goals, and specify materials separation and diversion strategies, among other items.

Waste management during operations will be managed as follows:

- Approaches to maximizing diversion of materials from landfill during the operations phase will be identified in the Sustainability Plan for the Project.
- Recycling receptacles and storage suitable to the waste generated on-site will be provided.

4.8.14.2.6 Sustainable Building Materials and Procurement

Life-cycle impacts – that is, the environmental impacts of the harvesting, manufacturing, packaging, transportation, distribution, operation and disposal of materials and resources (Metrolinx, 2016) – will be considered in the design and construction of the Project.

4.8.14.3 Meeting Ministry of the Environment and Climate Change Expectations and Metrolinx Sustainability Goals

As described in Sections 4.8.14.1 and 4.8.14.2 above, and summarized in **Table 4-119** below, the Project will be designed, constructed and operated to meet MECP expectations for considering climate change in the environmental assessment of a project and support the five goals outlined in Metrolinx's Sustainability Strategy 2015-2020 (Metrolinx, 2016).

TABLE 4-119: SUMMARY OF TRANSIT PROJECT PLANNING FOR CLIMATE CHANGE AND SUSTAINABILITY

Metrolinx Sustainability Strategy Goal	Project Component/ Environmental Feature	Measures to Mitigate Effects of the Transit Project on Climate Change	Measures to Mitigate Effects of Climate Change on the Transit Project	Additional Measures to Promote Sustainability	Outcomes
Goal 1: Become Climate Resilient	• Air Temperature	• Consider designs that employ mitigation measures to reduce the Project's contribution to urban heat island effect (e.g. use of vegetation, proactive shade management (i.e. walkways and surface parking) and use of reflective roof materials).	• Base designs on the most recent Design Requirements Manual (DRM), which includes consideration of direct and indirect impacts from extreme weather. • Consider design standards that take into account projected changes in temperature and its impacts. • Reduce solar absorption through building material selection and building automation, where possible.	• None.	• Reduced ambient air temperature within the local environment. • Enhanced minimized impact on surrounding community. • Reduced heat stress for on-site vegetation. • Reduced cooling costs.
	• Precipitation	• None.	• Base designs on the most recent DRM, which includes consideration of direct and indirect impacts from extreme weather. • Consider design standards that take into account projected changes in precipitation (rain and snow) and its impacts. • Use the most up-to-date Intensity-Duration Frequency (IDF) curves in the design of stormwater systems. • Consider Low Impact Development (LID) techniques and incorporate into design where feasible, with guidance provided in the *Low Impact Development Stormwater Management Planning and Design Guide* (Sustainable Technologies Evaluation Program (STEP), 2019). • Monitor SWM facilities including LID measures to ensure that these features are maintained appropriately and repaired where and when required. • Develop a SWM Report during detailed design. This will be completed in consultation with the TRCA and the MECP and will follow guidance provided by the MECP Stormwater Management Planning and Design Manual (2003) and MTO Drainage Management Manuel (2008). • Design SWM system to reduce direct overland flow and sheet run-off to storm receptors, holding tanks and other stormwater infrastructure requiring pump-outs. Encourage surface water flow velocity reduction and ground infiltration. • Design stormwater system to handle peak loading of winter and spring. • Incorporate stormwater capture systems (e.g., cistern) for irrigation.	• None.	• Minimized impacts on surrounding ecosystems and landscapes, since stormwater systems are designed to mostly control runoff from rainfall on-site based on predicted future scenarios. • Minimize impacts to stormwater management infrastructure, reducing ongoing operation and maintenance requirements. • Prepared for worst case scenario flows and sediment loading. • Increased infiltration allows for better management of stormwater should storms increase in intensity.
	• Drought	• None.	• Base designs on the most recent DRM, which includes consideration of direct and indirect impacts from extreme weather. • Consider design standards that take into account projected changes in precipitation (rain and snow), and other extreme weather events and their impacts. • Consider designs that: • Use collected rainwater for plant irrigation. • Use water conserving systems to reduce consumption. • Consider strategies for water conservation.	• None.	• Reduced drought impacts to on-site vegetation as a result of stormwater capture systems (e.g., infiltration/cistern). • Minimized impacts on surrounding ecosystems. • Reduced indoor and outdoor water use, minimizing the impact of extended droughts on operations and landscape plantings.

Metrolinx Sustainability Strategy Goal	Project Component/ Environmental Feature	Measures to Mitigate Effects of the Transit Project on Climate Change	Measures to Mitigate Effects of Climate Change on the Transit Project	Additional Measures to Promote Sustainability	Outcomes
			• Incorporate water metering into design. • Use species (native or non-native) that are hardy, drought and salt-tolerant, and resistant to the stresses of compacted soils and weather exposure. • Sustainability Plan will include plans and commitments to implement water conservation practices and set targets for water conservation.		
Goal 2: Reduce Energy Use and Emissions	• Planning for Transit	• The Project has been identified for implementation through a comprehensive, iterative planning process for new facilities in the GTHA. Facility locations were chosen based on GO Expansion business case analyses, with benefits outweighing impacts. • Improvements to transit will decrease average transit trip times and number of trips per day in the GTHA, even with an increasing population, leading to more people using public transportation and fewer vehicle-kilometres travelled in congested conditions. This reduction in congestion, when combined with expected improvements in automobile fuel efficiency, will result in a decrease in per capita GHG emissions from automobile trips (Metrolinx, 2018). The Project is anticipated to reduce traffic congestion and air emissions and improve per capita GHG emissions.	• None.	• None.	• Reduce traffic congestion and air emissions and improve per capita GHG emissions.
	• Energy Consumption and Emissions • GHG Emissions	• The Project is expected to contribute to an overall decrease in GHG emissions due to reduction in vehicles commuting, replaced by more trains carrying passengers. • Consider energy efficient design. • Develop an Energy and Emissions Management Plan that targets and programs to promote continuous reduction of energy and emissions (both GHG and criteria air contaminant (CAC)). Sustainability Plan will include plans and commitments to reduce energy consumption and use.	• None.	• Annual reporting of energy and emissions.	• Reduced GHG and CAC emissions. • Reduced energy waste and cost throughout life-cycle.
Goal 3: Integrate Sustainability in our Supply Chain	• Sustainable Building Materials and Procurement	• None.	• None.	• Identify of opportunities to use green construction materials such as those with recycled content or credible sustainability certifications. • Sustainability Plan will include plans and commitments to integrate sustainability criteria into the procurement of goods and services.	• Reduced life-cycle impacts.
Goal 4: Minimize Impacts on Ecosystems	• Environmental Management Systems	• Construct and operate the Project in accordance with Metrolinx's Env.MS, which is aligned with ISO 14001, and includes the Sustainability Plan. • Develop a Sustainability Plan aligned with Metrolinx's Sustainability Strategy and the Env.MS. The Sustainability Plan will set targets, measurements and monitoring methods, and reporting format. Together with the EnvMS, this will ensure compliance and continuous improvement.	• Sustainability Plan will include identification of climate change risks and vulnerabilities.	• Construct and operate the Transit Project in accordance with Metrolinx's Env.MS, which is aligned with ISO 14001.	• Environmental compliance through continuous monitoring. • Monitoring of impacts will support ecosystem resilience.
	• Vegetation Compensation and Revegetation	• Vegetation will be compensated in accordance with the Metrolinx Vegetation Guideline. • The success of compensation vegetation will be monitored in accordance with the Metrolinx Vegetation Guideline.	• Select plant material that is suitable to the growing environment of the site. • Use species (native or non-native) that are hardy, drought and salt-tolerant, and resistant to the stresses of compacted soils and weather exposure.	• Post-planting monitoring of restoration areas after installation 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. • Where there are opportunities for revegetation/landscaping, consider opportunities to, among others: o Enhance biodiversity and ecosystem value	• Compensation for vegetation removals to mitigate potential impacts on carbon sinks. • Revegetation completed as soon as possible, with plant material that is suitable to the growing environment of the

Metrolinx Sustainability Strategy Goal	Project Component/ Environmental Feature	Measures to Mitigate Effects of the Transit Project on Climate Change	Measures to Mitigate Effects of Climate Change on the Transit Project	Additional Measures to Promote Sustainability	Outcomes
				○ Develop pollinator habitat plan in support and alignment with Ontario Pollinator Health Action Plan ○ Avoid planting invasive species near ravines and other natural areas	site, to mitigate potential impacts on carbon sinks. • Verification/assurance of success of plantings.
	• Waste Management and Reduction	• None.	• None.	• Develop and implement a Construction and Demolition Waste Management Plan prior to construction and document opportunities for reuse and recycling of materials during construction, establish waste diversion goals, and specify materials separation and diversion strategies, among other items. • As part of the Sustainability Plan, identify ways to maximize diversion of materials from landfill, including the provision of recycling receptacles suitable to the waste generated.	• Increased waste diversion from landfill during construction and operations.
	• Salt Reduction Initiatives	• None.	• None.	• Implement and maintain the Winter Maintenance Plan for facilities maintenance, which might include the consideration of: • Methods of minimizing the use of salt and other chemicals. • Requiring winter maintenance providers to maintain Smart-About-Salt certification from the Smart About Salt Council. • Best practice techniques including the use of brine and pre-wetting techniques. • Tracking and monitoring usage of salt and other snow and ice control substances. • Using low-chloride options and salt alternatives in environmentally sensitive areas. • Ensuring automated equipment is calibrated. • Continue development of a salt management strategy, for future use at the facilities. • Design rail platforms with full width hydronic snow melting systems.	• Minimized impacts to local water bodies and reduced corrosion and wear on assets and infrastructure without compromising safety. • Reduced chemical exposure for employees and environment. • Reduced operational costs.
Goal 5: Enhance Community Responsibility	• Community Benefits	• None.	• None.	• Develop a Community Benefits Framework • Implement a Community Benefits Agreement based on the Community Benefits Framework, which might include: • Opportunities for local workforce development in project construction ○ Procurement from local businesses and social enterprises ○ Opportunities to build partnerships with local community organizations ○ Engagement with educational programs to further innovation and sustainability objectives. • Sustainability Plan will include plans and commitments to provide programs that support employment and training, mental health and local economic development.	• Enhanced social and economic benefits for local communities
	• Light, Noise and Vibration Impacts	• None.	• None.	• Minimize light pollution in accordance with the DRM to reduce spill off into surrounding canopies, without compromising safety and security. • Develop and implement a Noise and Vibration Control Plan prior to construction, to minimize construction noise and vibration. • Design facilities and choose equipment to minimize noise from rail operations. • Utilize isolators and vibration control devices as required so that equipment noise and vibration do not interfere with GO Transit operations.	• Improved relationships with surrounding communities.

4.9 Construction Impacts

For construction impacts related to the USRC Hydro One Conflicts, please refer to **Section 4.2.3** above.

4.9.1 Natural Environment

4.9.1.1 Overhead Contact System

4.9.1.1.1 Potential Effects and Mitigation Measures

4.9.1.1.1.1 Terrestrial

The broader vegetation removals related to the construction and site footprint of proposed layover and storage yard facilities has been addressed within the New Track & Facilities EPR prepared by Gannett Fleming(2020) for the Walkers Line Layover and Unionville Storage Yard, and the Scarborough Junction Grade Separation EPR prepared by Stantec (2020) for the Midland Layover. This includes layover/storage yard facility components, such as access roads and facilities contained within the area anticipated to be disturbed by layover construction, as determined on the basis of the Reference Concept Design.

During the construction for the installation of the OCS, vegetation removals will be required. A Vegetation Management Plan will be prepared during detailed design. There are also many natural vegetation communities which could be potentially impacted because of their proximity to proposed clearing areas, and site specific edge management mitigation measures will be identified during detailed design. Edge Management will be consistent with the Integrated Vegetation Management guidelines and zones included in the **Metrolinx Vegetation Guideline** (refer to **Figure 2-1** for identification of the designated zones). This includes seeding with seed mixes consistent with natural vegetation communities within the low grow zone (zone 3). Zone 4 and 5 are outside the vegetation clearing zone; however, replanting with recommended compatible species may occur in these zones. Trees not slated for removal should be protected and maintained. The most typical construction damage to trees is root damage through compaction and severance and damage to the trunk. Root loss can impact trees through compromising structural integrity and through restriction of nutrient uptake. Trees that are very large are more susceptible to construction damage. The following mitigation measures related to Tree Protection, as part of the Vegetation Management Plan, should be followed:

- Adhere to relevant guidelines and OPSS for clearing and grubbing (OPSS 201), site preparation and tree protection (OPSS 801).
- Establish a Tree Protection Zone (TPZ) fencing to protect and prevent tree injuries in accordance with local by-law requirements.
- Remove branches that are likely to be damaged by construction equipment before construction so that bark is not torn accidentally, and wounds are not more extensive than absolutely necessary.
- Conduct pruning of branches through the implementation of proper arboriculture techniques.

During the installation of OCS, vegetation clearing will be required, and nests of migratory birds may be encountered. Nests and eggs of migratory birds are protected by the MBCA and the FWCA applies to birds not covered by the federal MBCA. To ensure compliance with the MBCA,

the following mitigation measures are proposed in order to reduce or mitigate the potential for adverse effects on birds and their nests:

- Vegetation removals should occur outside of the migratory bird nesting season from April 1st to August 31st.
- Should vegetation clearing be required within the period from April 1st to August 31st, breeding bird and nest surveys will be undertaken no more than 45 hours prior to required activities/vegetation removal.
- Active nests and eggs of protected migratory birds should not be destroyed at any time and site-specific mitigation should be developed in consultation with the Canadian Wildlife Service.
- Nests and eggs of protected Species at Risk birds should not be destroyed at any time. If the nest of a protected Species at Risk must be damaged or destroyed, consultation with the appropriate regulatory agency is required and a permit under the *Endangered Species Act* or *Species at Risk Act* (federal lands only) may be necessary.

Impacts to migratory birds from the installation of the OCS are anticipated to be low as the infrastructure will be placed within the active/existing rail corridor. The height of the portals/cantilevers used to support the OCS wires will range between 7.6 metres to 12.0 metres above the top of the highest rail. Contact wire height will range from 6.0 metres to 7.6 metres. The OCS will not create a solid barrier to migratory bird movement as they will have the ability to navigate around the wires, similar to electrical transmission lines elsewhere throughout Ontario. There is limited risk to birds associated with the OCS wires or supporting structures with respect to electrocution as the conductor and ground wires will not be positioned within close enough proximity. Birds will be able to perch on the wires without harm.

While there are vegetation removals identified for communities that may support amphibians, no direct impacts to amphibian breeding habitat are anticipated. There is potential for these species to exist within wetland areas adjacent to the OCS impact zone, particularly within wetland areas identified as environmentally significant (PSWs, ESAs). Where wetland features are present within or immediately adjacent to the OCS footprint impact/vegetation removal zone, it is recommended that silt fencing be erected to act as a physical barrier between the limit of vegetation removal zone and adjacent wetlands in accordance with the Reptile and Amphibian Exclusion Fencing: Best Practices, Ver 1.1 (OMNR, 2013).

Sedimentation and erosion may result from vegetation clearing and excavations for OCS foundations. An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA[89], 2019), will be prepared prior to and implemented during construction to minimize the risk of sedimentation into natural features. Mitigation measures designed to reduce or mitigate the potential for adverse effects caused by sediment and erosion include:

[89] *As a Crown Agency, GO/Metrolinx is exempt from the Conservation Authorities Act and as such does not have a requirement to apply for and obtain permits from conservation authorities. Wherever possible, GO/Metrolinx will engage the conservation authority on specific projects (or components thereof) and will adhere to requirements when and where possible.*

- Adherence to Ontario Provincial Standard Specifications relating to proper sediment and erosion controls including (OPSS) – OPSS 805 (Erosion and Sediment Control Measures).
- Terraseeding all fill piles and disturbed areas with annual and native seed mixes, as appropriate.
- Restore disturbed areas immediately following completion of construction activities in a given area.

Construction will also generate dust, noise and light that may affect vegetation and wildlife. Wildlife utilizing the site may be temporarily displaced during construction. However, these animals are already exposed to high noise levels and are tolerant of urban conditions. Mitigation measures and consideration for wildlife movement and migration corridors shall be considered during Detail Design and construction. Mitigation measures to reduce or mitigate the potential for adverse effects caused by construction activities include:

- The contractor should adhere to relevant guidelines and Ontario Provincial Standard Specifications, including OPSS 506 (Dust Control).
- Yielding the right-of-way to wildlife around all construction equipment and vehicles, if it is safe to do so.
- Advising workers to perform visual survey of machinery and work areas prior to commencing work since wildlife may be found basking or hiding on or under equipment, rocks, debris piles, etc.
- Not allowing construction debris to accumulate on-site and on the soils surface but regularly cleaning up the site to reduce the possibility of wildlife using debris piles for shelter.
- Protecting any wildlife incidentally encountered during construction.
- Advising workers to perform a visual survey of machinery and work area prior to commencing work since wildlife may be found hiding in or under equipment, rocks, debris piles, etc.

In addition, there is potential for invasive and disturbance-tolerant non-native species to establish on exposed stockpiles of excavated soils or be introduced on equipment during construction. Construction activities may cause the spread of non-native and invasive species. These species include but are not limited to Emerald Ash Borer (*Agrilus planipennis* Farmaire), Asian Long-horned Beetle (*Anoplophora glapripennis*), and Common Reed (*Phragmites australis*), Japanese Knotweed (*Reynoutria japonica*) and Dog-strangling Vine (*Vincetoxicum rossicum*). The Invasive Species Act (MNRF, 2015) provides a legislative framework for classifying invasive species as either prohibited or restricted species. Species are classified by either regulation or designation by the Minister. The Act provides prohibitions for each class of invasive species as well as mechanisms for preventative measures, inspection and action once an invasive species is identified. The management of invasive species shall be undertaken as prescribed by the Integrated Vegetation Management within the **Metrolinx *Vegetation Guideline*** (2020). Mitigation measures related to invasive species with potential within the study area will ensure compliance with the Act. Due to the broad range of invasive species, appropriate management for invasive species will be species- and site-specific. The following

mitigation measures are proposed to deal with the potential establishment or spread of invasive species:

- Where possible, storing excavated soils for a period of less than 45 days.
- Reseeding soils with a native seed mix suited to the site conditions once they are replaced.
- Cleaning equipment between sites to prevent the spread of invasive species.
- Carrying out vegetation removals of Ash trees in a manner in compliant with the Ministerial Order issued by the Federal Government which identifies prohibitions and restrictions of movement on trees, leaves, logs, lumber, wood/wood chips from all ash species. Unless authorized by a Movement Certificate issued by the CFIA, moving these products out of the Regulated Area is prohibited. This is necessary to prevent the spread of the Emerald Ash Borer (EAB) to un-infested areas in other parts of Ontario and Canada. The Contractor must dispose of all wood at a registered waste facility.
- Carrying out vegetation removals within the Regulation Area for Asian Long-Horn Beetle (associated with Kitchener Corridor segments only) within the 12 genera identified as host trees in a manner that complies with the Ministerial Order issued by the Federal Government in 2013 which identifies prohibitions and restrictions of movement on trees, leaves, logs, lumber, wood/wood chips from host species of the Asian Long-horned Beetle. Unless authorized by a Movement Certificate issued by the CFIA, moving these products out of the Regulated Area is prohibited. The Contractor must dispose of all wood at a registered Waste Facility.

During construction, equipment may leak, or spills may occur. Accidental contamination may occur during the handling and storage of toxic products such as fuel and concrete mixtures. Mitigation measures related to spills/contamination include:

- Prepare an Emergency Preparedness and Response Plan to govern spill response.
- Locate spill cleanup and response equipment on site.
- Conduct fuel transport in compliance with the *Transportation of Dangerous Goods Act*.
- Use spill decks for transferring products to smaller containers.
- Locate fire extinguishers near petroleum, oil and lubricants storage areas.
- Implement all necessary precautions to prevent the spillage and release of hazardous materials to the environment.
- Report all leaks or spills immediately to the Ministry of the Environment, Conservation and Parks (MECP), Spills Action Centre at 1-800-268-6060.

4.9.1.1.1.2 Aquatic

There are no direct impacts to watercourses anticipated to result from OCS installation activities throughout the corridor as all work will be within the existing Metrolinx rail ROW away from the watercourses. Potential indirect effects of the construction works include siltation, introduction of contaminants into the watercourse through the use of industrial equipment, and construction debris. These potential impacts can be mitigated by implementing the following measures related to sediment and erosion control:

- Adhere to relevant guidelines and Ontario Provincial Standard Specifications relating to proper sediment and erosion controls including consideration of the Erosion and Sediment Control Guide for Urban Construction (TRCA[90] 2019) and Ontario Provincial Standards Specifications (OPSS) – OPSS 805 (Erosion and Sediment Control Measures).
- Design and implement erosion and sediment controls to contain/isolate the construction zones, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment to any watercourses, and ensure sites are stabilized prior to removal following construction.
- Limit access to waterbody and banks to protect riparian vegetation and minimize bank erosion. Shorelines or banks disturbed by construction activities will be immediately stabilized, through re-vegetation with native species suitable for the site.

Mitigation measures relating to accidental contamination of watercourses include:

- Preparing an Emergency Preparedness and Response Plan to govern spill response.
- Ensuring spill kits are on-site at all times for implementation in the event of an accidental spill during construction.
- Operating, storing and maintaining all equipment and associated materials in a manner that prevents the entry of any deleterious substance to the waterbody.
- Conducting fuel transport in compliance with the Transportation of Dangerous Goods Act.
- Reporting all leaks or spills immediately to the Ministry of the Environment, Conservation and Parks (MECP), Spills Action Centre at 1-800-268-6060.

As noted above, no direct impacts to watercourses including in-water works are anticipated. Should impacts to watercourses be identified during Detailed Design, additional investigations (as required) will be undertaken by the Contractor as appropriate in accordance with applicable legislation to characterize the impacts. In the event the need for in-water works is identified post EA, the following mitigation measures shall include but not exclusive to:

- Undertaking an assessment by a qualified Fisheries Specialist to determine measures to avoid causing harm to fish and fish habitat, including aquatic species at risk to determine the need for DFO review.
- Complying with all in-water works with the timing windows identified by MNRF.
- Complying with OPSS 180 (Management of Excess Materials) and OPSS 182 (Environmental Protection for Construction in Waterbodies and on Waterbody Banks) during construction.

[90] As a Crown Agency, GO/Metrolinx is exempt from the Conservation Authorities Act and as such does not have a requirement to apply for and obtain permits from conservation authorities. Wherever possible, GO/Metrolinx will engage the conservation authority on specific projects (or components thereof) and will adhere to requirements when and where possible.

4.9.1.1.1.3 Species at Risk

The habitat of threatened and endangered species is protected under the *Endangered Species Act* (ESA). If avoidance and mitigation measures are implemented, a contravention under the *Endangered Species Act Section 9 ("No person shall, kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species") and/or Section 10 ("No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario [SARO] list as an endangered or threatened species")* would not occur. Early consultation with the MECP during the Detailed Design phase will be required to evaluate impacts to Species at Risk from any construction activities including access roads, construction pads, and vegetation removals; develop options for reducing or mitigating impacts; implement appropriate timing windows; and determine permitting/authorization requirements. Any sediment and erosion control measures for any habitat regulated pursuant to the ESA will be reviewed and/or approved by the MECP.

There is potential for Butternut to occur within the rail corridors and be affected by construction impacts. The presence/absence of Butternuts will be confirmed through tree inventories of impacted areas during Detailed Design. A health assessment will be undertaken at that time for any pure Butternuts. Should any Butternuts be found during detailed tree inventories, appropriate approval under the ESA, 2007 will be required. Depending on the number of Butternuts identified and their conditions, they may be required to comply with a registration or permitting process. Protective measures for any Butternuts within 50 metres of the construction footprint that do not need to be removed should be implemented.

Where Species at Risk habitat is identified/confirmed during detailed design, recommended mitigation measures for species such as Redside Dace, Species at Risk bats, and Species at Risk birds include conducting activities (i.e. tree/vegetation clearing) outside of designated timing windows for these species. The timing windows are as follows:

- Species at Risk birds are protected by the general migratory bird window of April 1st to August 31st.
- Species at Risk bats are protected by the timing window of April 1st to September 30th.
- Redside Dace are protected by the timing window of September 16th to June 30th.

In addition to respecting appropriate timing windows for work within regulated habitat for Redside Dace, activities should be in compliance with the Guidance Document for Activities in Redside Dace Habitat, Ver.1.2 (MNRF, 2016). The MECP will review and approve all plans for sediment and erosion control measures within the regulated habitat.

As part of detailed design, requirements relating to SAR bats will be discussed with the MECP in relation to applicability and preferred approach for any permits/approvals as it relates to the Electrification Project works. Any required MECP permits/approval will be obtained prior to project implementation.

In addition to the potential direct footprint impacts noted above, there is potential for SAR species to travel through the rail corridor to adjacent habitats, and for SAR turtles to use slope embankments or gravel surfaces adjacent to the tracks for nesting. As such, the following recommended general mitigation measures to protect Species at Risk include:

- Providing all workers with awareness training (e.g. factsheets) that addresses the existence of potential Species at Risk on site, identification of those species and proper actions when an individual is encountered and/or needs to be moved out of harm's way.

- Prior to commencing work, inspecting each work site for individual SAR and any individuals found should be left to move on their own or moved properly out of harm's way in the direction they were heading.
- Reporting all Species at Risk sightings and encounters to the Natural Heritage information Centre (NHIC) using the appropriate reporting form.
- Stopping all construction activities that disturb or could harm the turtle if a turtle is encountered on site. If the turtle appears to be simply moving through the area, a worker trained in safe handling of turtles should carefully move the turtle out of the work site to a safe and suitable location nearby. All turtle observations and relocations should be documented.
- Stopping construction activities and allowing turtles to be allowed to finish nesting and leave the area on its own, if the turtle has already begun to nest, (i.e. digging and/or sitting in a nest pit).

4.9.1.1.1.4 Designated Areas

OCS infrastructure is proposed within the Greenbelt Plan areas and Lake Simcoe Protection Plan areas. There are no reasonable alternatives to siting OCS in these areas, given that OCS can only be located within the pre-existing rail corridors, which were located on these lands prior to the adoption of both plans.

For impacts and mitigation related to terrestrial features within Designated Areas, refer to Section 4.9.1.1.1.1.

4.9.2 Preliminary Environmental Site Assessment

Prior to construction, a Phase II ESA is recommended Midland Layover and Walkers Line Layover to assess the quality of the soils and groundwater in accordance with the current applicable MECP Standards.

In addition, the following mitigation and monitoring measures will be implemented at layover facilities during construction:

- Develop a Soil and Excavated Materials Management Plan for the handling, management and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the work. The plan will be overseen by a Qualified Person pursuant to Ontario Regulation 153/04 under the Environmental Protection Act (QP) and will comply with Ontario Regulation 406/19 (On-Site and Excess Soil Management – to be enacted into law on January 1, 2021), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices (April 2019, as amended) and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement, as applicable.
- Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented

by testing where applicable to determine management and disposal requirements as per Ontario Regulation 347 (as amended) and all Applicable Law.

- The Soil and Excavated Materials Management Plan will be reviewed and approved by Metrolinx prior to construction.
- A Soil and Excavated Material Monthly Dashboard Report will be developed by the Constructor for Metrolinx review that includes monitoring and performance data related to the management of excavated materials for the preceding month.
- Upon completion of the work, the Constructor will submit a Soil and Excavated Material Management Implementation Report to Metrolinx.

4.9.3 Built Heritage Resources and Cultural Heritage Landscapes

Short-term disruption to the setting of cultural heritage resources resulting from construction activities though the introduction of physical, visual, noise-related, and atmospheric elements that are not in keeping with the character of the property may be experienced.

4.9.3.1.1 Potential Effects and Mitigation Measures

Table 4-120 summarizes the BHRs or CHLs that may be impacted as a result of OCS infrastructure associated with the new track and layover facilities.

TABLE 4-120: CONSTRUCTION IMPACTS ON CULTURAL HERITAGE RESOURCES

CHR Reference	Type and Description of Potential/Anticipated Impact	Mitigation Measures
#BR-05 #BR-06 #BR-07 #BR-08 #BR-09 #BR-13 #BR-14 #BR-15 #BR-16 #BR-18	Indirect impacts to the heritage attributes of a potential BHR are anticipated as a result of the additional OCS infrastructure area. In particular, the construction activities associated with the additional OCS infrastructure area may result in limited and temporary adverse vibration impacts to the building which sits as close as approximately three (3) m in some instances from the proposed new track.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations.. The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken.

Construction related impacts within the USRC as a result of the Hydro One Conflicts are summarized in Section 4.2.3.3.1.

4.9.4 Archaeology

Stage 2 / 3 Archaeological Assessment Studies have been recommended as described in Sections 4.3.4.8 and 4.5.4.12 above and in the Stage 1 Archaeological Assessment Report prepared for the NT&F TPAP. Based on the results of the Stage 2 studies, Stage 3 and/or 4 Archaeological Assessments will also be carried out as required during detailed design.

Construction related impacts within the USRC as a result of the Hydro One Conflicts are summarized in Section 4.2.3.4.1.

4.9.5 Land Use

There are no changes or additions to construction practices beyond what has already been assessed as part of the 2017 TPAP.

4.9.6 Socio-Economic

Presently all socio-economic effects resulting from the construction of facilities are anticipated to be short term in duration, relating largely to noise and visual disturbance. Additional consultation will be undertaken during the Detailed Design and construction phases to ensure that local businesses and property owners are aware of construction scheduling and that staging options can be developed to minimize potential effects on local access and travel patterns where possible.

Potential effects to sensitive facilities resulting from the construction of the electrification components (e.g., OCS) of the electrified GO trains may include nuisance effects such as noise, vibration, and temporary traffic effects (e.g., temporary detours); however, these effects will cease once construction has finished. Construction activities for the OCS and gantries are anticipated to occur during night time hours.

Mitigation Measures

Proper fencing should be erected around all work areas prior to commencement of any earth moving, clearing or construction activities in order to prevent encroachment on adjacent properties. Fencing should remain for the duration of the work, and be periodically inspected to ensure it is in good repair.

Staging options should be developed to minimize potential effects on local access and travel patterns where possible. A Construction Management Plan and Traffic Management Plan should be developed prior to construction and circulated to local municipalities/road authorities for review and discussion.

In addition, mitigation measures for nuisance effects on sensitive facilities from construction, as outlined in the Air Quality Assessment Report contained in **Appendix F** of the EPR Addendum and Noise & Vibration Reports contained in **Appendix G** of the EPR Addendum, should be adhered to.

4.9.7 Air Quality

In general, construction activities will involve heavy equipment that generates air pollutants and dust. Mitigation of construction emissions is normally achieved through diligent implementation of operating procedures. The construction activities that are likely to have short term air quality effects are the construction of the OCS support foundation structures. Installing the OCS support foundation structures will require the use of augers and excavators to create holes, the removal of excess material by haul truck, and the filling of holes with cement from a cement truck.

All these activities can produce significant dust but it can be minimized by watering or applying other dust suppressants, covering up stockpiles, reducing travel speeds for heavy vehicles, minimizing haul distances, and efficiently staging the activities. After the OCS support structures have been installed, the OCS wire will be run the entire length of the corridor. The main emissions from this activity will be the combustion of fuel and the potential for some dust from transportation, however, these emissions are expected to be modest relative to the emissions from other locomotives using the corridor. As a result, this activity is expected to have minimal impact on air quality.

A separate assessment of construction air quality impacts and applicable mitigation measures has been undertaken for new layover facilities and is included within the 2020 New Track and Facilities EPR and 2020 Scarborough Junction Grade Separation EPR. As electrification infrastructure is a component of these future layover facilities, air quality mitigation measures will be coordinated as part of future project phases. Temporary effects on air quality during the construction of OCS will be minimized by implementing the mitigation measures described below.

Construction related air pollution may pose risks to human health and wellbeing. Prior to commencement of construction, develop and implement a detailed Construction Air Quality Management Plan (AQMP) to Metrolinx. The AQMP will:

- Demonstrate compliance with the specific air quality criteria and limits in the Metrolinx Environmental Guide for Air Quality and Greenhouse Gas Emissions Assessment (2019);
- Define the Project's air quality impact zone and identify all sensitive receptors within this area;
- Assess the baseline air quality by continuous measurement of local ambient concentrations of $PM_{2.5}$ and PM_{10} over a minimum period of one week, where large local sources of pollution, such as highways, directly affect the Zone of Influence of the Project;
- Estimate and document the predictable worst-case air quality impacts of the Project on sensitive receptors within the air quality impact zone, develop appropriate mitigation measures, demonstrate their effectiveness, and commit to their timely implementation;
- Monitor continuously any contaminant, in addition to $PM_{2.5}$ and PM_{10}, which is predicted to exceed its relevant air quality exposure criterion during any phase of the Project and at any receptor; and
- Include explicit commitment to the implementation of all applicable best practices identified in the Environment Canada document, Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities (2005).

In addition, a Communications Protocol and a Complaints Protocol will be developed to respond to issues that develop during construction. Metrolinx will monitor the construction staging/laydown areas to ensure nuisance effects (i.e., noise and dust) are minimized to the extent possible.

Weekly Air Quality Monitoring Plans will also be developed and implemented during construction. These plans will document how air quality monitoring has been conducted and

compliance assessed to effectively prevent unacceptable rates of air emissions in accordance with the following guidelines:

- The construction related air contaminants of primary concern are in the form of particulate matter, with the principal construction related fractions of $PM_{2.5}$ and PM_{10} - particulate matter of less than 2.5 and 10 micron in diameter, respectively. Other contaminants of concern include crystalline silica and oxides of nitrogen. The list of contaminants will be expanded with any and all air pollutants that may be produced as a result of the work;
- The criteria for $PM_{2.5}$, PM_{10} and crystalline silica are provided in Metrolinx's *Environmental Guide for Air Quality and Greenhouse Gas Emissions Assessment* (2019). The applicable criteria for all other air contaminants of concern are to be found in the various schedules of *Ontario Regulation 419/05*; and
- Siting of the monitors should generally follow the guidelines provided in the Ministry of the Environment, Conservation and Parks (MECP) *Operations Manual for Air Quality Monitoring in Ontario* (2018).

4.9.8 Noise and Vibration

Construction noise and vibration impacts are temporary in nature, and largely unavoidable. It is anticipated that the construction of OCS infrastructure (including the installation of foundations, erecting of poles, and hanging of wires) will produce temporary increases in sound levels above ambient conditions at nearby receptor locations.

Metrolinx developed a recommended management approach to construction noise and vibration as well as applicable criteria. The Metrolinx Work Plan uses United States' Federal Highway Administration and FTA references to establish relevant construction-related criteria, which are also used to establish acceptable sound and vibration levels for various equipment. These criteria have been used in conjunction with Section 8 of the "Environment Guide for Noise and Vibration Impact Assessment" developed by RWDI and approved by Metrolinx (Metrolinx, 2019).

Construction sound levels are assessed against their own set of criteria based on the nature of the receptor, time of day, and the duration of the assessment period. **Table 4-121** summarizes the noise exposure limits that are provided in the Metrolinx Work Plan and used for this assessment.

TABLE 4-121: CONSTRUCTION NOISE CRITERIA

Land Use	L_{EQ} (dBA)[1]		L_{EQ} (15-min) (dBA)		L_{MAX} (dBA)	
	Day [2]	Night [3]	Day [2]	Night [3]	Day [2]	Night [3]
Residential - Weekday	Louder of: 75 or Baseline+5	Louder of: 65 or Baseline+5	85	75	90	80
Residential – Weekend & Holiday	Louder of: 70 or Baseline+5	Louder of: 60 or Baseline+5	75	65	90	80
Institutional	Louder of: 70 or Baseline+5	Louder of: 60 or Baseline+5	75	65	90	80
Commercial	Louder of: 80 or Baseline+5	None	None	None	None	None

Land Use	L_{EQ} (dBA)[1]		L_{EQ} (15-min) (dBA)		L_{MAX} (dBA)	
	Day [2]	Night [3]	Day [2]	Night [3]	Day [2]	Night [3]
Industrial	Louder of: 85 or Baseline+5	None	None	None	None	None

Notes: [1] Weekday L_{EQ} (day) and L_{EQ} (night) are over a 16-hour and an 8-hour period, respectively. Weekend and Holiday L_{EQ} (day) and L_{EQ} (night) are over a 14-hour and a 10-hour period, respectively.
[2] Weekday daytime period is 0700 – 2300h, while Weekend and Holiday daytime period is 0900 – 2300h.
[3] Weekday nighttime period is 2300 – 0700h, while Weekend and Holiday nighttime period is 2300 – 0900h.

Provincial agencies, such as Metrolinx and Hydro One, are not subject to municipal by-laws, Metrolinx has endeavoured to adhere to these local bylaws as a best practice, including limiting nighttime noisy activities where practical. The by-law intents were considered in the development of the construction noise criteria summarised in Table 8 (e.g., weekend and holiday limits).

Vibration is assessed against two sets of criteria, one for annoyance and one for damage as provided in the Metrolinx Work Plan and outlined in **Table 4-122**. Although some components of the project scope and study area are outside the City of Toronto, the building damage criterion developed by the City of Toronto is widely used as guidance in jurisdictions where no such guidance exists and is aligned with current best practices for vibration assessment. These criteria are expressed on a different basis, with annoyance criteria linked to root mean square (RMS) vibration levels (i.e., representative of the "average" over time) and damage criteria being based on instantaneous peak vibration levels. Annoyance criteria are typically the limiting condition compared to building damage since people usually detect perceptible vibrations at levels below where damage occurs. Both need to be considered however, since a very brief intense vibration event may exceed building damage criteria and not be readily perceptible.

TABLE 4-122: VIBRATION EXPOSRE GUIDANCE/CRITERIA REGARDING PUBLIC ANNOYANCE AND BUILDING DAMAGE

Target of Guidance/Criteria	Source of Guidance/Criteria	Description of Criteria
Annoyance[1]	1995 MOEE/GO Protocol	Vibration Velocity not to exceed 0.14 mm/s or current conditions (whichever is higher) by more than 25%
Building Damage[2]	City of Toronto by law Vibration: Chapter 363 dated November 27, 2019 and Noise Chapter 591 dated December 18, 2020	Vibration Velocity to be limited to 8 – 22 mm/s depending on vibration frequency.

1. Vibration is assessed as root-mean-square velocity.
2. Vibration is assessed as peak-particle velocity.

For historical buildings, a criterion of 5 mm/s was used. This criterion is below the lowest of the building damage criteria of 8 mm/s provided in **Table 4-122**.

A separate assessment of construction noise and vibration impacts and applicable mitigation measures has been undertaken for new layover facilities and is included within the 2020 New Track and Facilities EPR and 2020 Scarborough Junction Grade Separation EPR. As electrification infrastructure is a component of these future layover facilities, noise and vibration mitigation measures will be coordinated as part of future project phases. Temporary effects on

noise and vibration during the construction of OCS will be minimized by implementing the mitigation measures described below.

Prior to commencement of construction, a detailed Construction Noise Management Plan shall be developed and submitted[91]. The Construction Noise Management Plan shall:

- Document and commit to all measures to be taken for meeting the noise exposure limits documented in the Metrolinx *Guide for Noise and Vibration Assessment* (2020) at every directly exposed sensitive receptor and throughout the entire project;
- Determine the Zone of Influence for construction related noise based on the noise exposure limits outlined in the Metrolinx *Guide for Noise and Vibration Assessment* (2020) and taking into consideration the construction site, staging and laydown sites and hauling routes, each stage of the construction (including demolition), the overall construction schedule along with the schedule of each major component and associated major construction processes and equipment usage; and
- Identify all sensitive receptors that fall within the Zone of Influence for construction related noise. Mitigation measures will be proposed for these sensitive receptors, and the effects of the proposed mitigation measures will then be evaluated using noise modelling. If results of the modelling indicate that any sensitive receptors still remain within the Zone of Influence for construction related noise, then the following shall apply:
    - Additional mitigation is proposed and subsequently modelled until the sensitive receptor does not fall within the Zone of Influence; or
    - If mitigation strategies are not viable, receptor-based mitigation will be proposed.
    - Scale, location and complexity of the project;
- The Construction Noise Management Plan will include the temporary/permanent noise barriers indicated in the applicable noise and vibration construction impact assessment report (2020). Where additional work sites are identified which were not assessed as part of the applicable noise and vibration construction impact assessment report (2020), or where construction activities at any given site differ from those considered in this report, conduct modelling to evaluate the need for additional noise barriers as part of the Construction Noise Management Plan.

The Construction Noise Management Plan will incorporate the following requirements related to monitoring of noise and noise related complaints and these measures will be implemented during construction:

- Monitor noise where the Construction Noise Management Plan indicates that noise exposure limits may be exceeded. At these locations, monitor noise continuously at each geographically distinct, active construction site with one monitor located strategically to capture the highest exposure level based on planned construction activities and the number, geographic distribution and proximity of noise sensitive receptors. Develop weekly reports describing the monitoring conducted and summarizing the data collected for the reporting period. The reports will include but not be limited to the number and duration of any incident during which any of the

[91] Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time. If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies.

noise exposure limits documented in the Metrolinx Guide for Noise and Vibration Assessment (2020) were exceeded, the probable cause of each exceedance, the incident-specific measure(s) implemented, the resulting mitigated noise levels and the complaints investigation procedure; and

- Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.

Exposure to vibration may result in public annoyance and complaints. Vibration may also cause damage to buildings and other structures. The following measures[92] will be implemented and adhered to during construction:

- Adhere to the following vibration exposure limits:
    - Vibration, as a human irritant, is assessed in terms of its average level. Vibration velocity should not exceed 0.14 mm/s or current conditions (whichever is higher) by more than 25%;
    - As a threat to buildings, vibration is assessed in terms of its peak value. The Zone of Influence for vibration shall be the area where structures are expected to experience vibration peak particle velocities that exceed 5 mm/s. Vibration velocity should be limited to 8-22 mm/s, depending on vibration frequency. These limits are prescribed by the most current versions of the Municipal Code Chapter 591, Noise (2020) and Chapter 363, Vibration (2019) for typical structures (not building with special needs);
- Adhere to the ground-born (vibration induced) noise exposure criteria in the US FTA Report No. 0123, *Transit Noise and Vibration Impact Assessment Manual* (2018); and
- Develop and implement a detailed Construction Vibration Management Plan for Metrolinx review and approval with minimum requirements outlined below:
    - Complete a detailed construction related vibration assessment prior to the commencement of construction that includes assessment of the vibration Zone of Influence. The Zone of Influence for vibration shall be established by using the methodology and input data provided in Section 7.2 of the US FTA Report No. 0123 (2018), *Transit Noise and Vibration Impact Assessment Manual* (2018);
    - Complete pre-construction condition surveys for properties within the vibration Zone of Influence of the planned work to establish their condition and establish a baseline prior to any work beginning;
    - Identify any heritage structures and other sensitive structures, buildings or infrastructure vulnerable to vibration damage, assess requirements and, if necessary, develop mitigation measures;
    - Identify buildings, where vibration sensitive activities such a sound recording or medical image processing take place, assess requirements and, if necessary, develop mitigation measures;

[92] Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time. If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies.

- Establish a 15-metre setback distance between the construction vibration source and nearby buildings, where possible, to minimize impacts. If this is not possible, then monitor the vibration levels associated with the activity;
- Select construction/maintenance methods and equipment with the least vibration impacts; and
- In the presence of persistent complaints and subject to the results of a field investigation, identify alternative vibration control measures, where reasonably available.

The Construction Vibration Management Plan will incorporate the following requirements related to monitoring of vibration and vibration related complaints and the provisions of this Plan will be implemented and adhered to during construction:

- Monitor vibration continuously at structures where the Construction Vibration Management Plan indicates that structures are deemed to be within the Zone of Influence for construction related vibration or at additional structures as requested by Metrolinx; and
- The type of Vibration Monitoring Program that is established is based on the vibration Zone of Influence, the project location, duration, presence of night-time activity, and receptor proximity. The monitoring types include:
  - Type 1: Monitoring continuously throughout the project (for receptors within the Zone of Influence).
  - Type 2: Monitoring during most impactful phases of the project only (for receptors outside of the Zone of Influence but within 50 m of the boundary of the construction site).
  - Type 3: Monitoring in response to complaints only (for receptors outside of the Zone of Influence and beyond 50 m of the boundary of the construction site).
- Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.

4.9.9 Visual

There are no changes or additions to construction practices beyond what has already been assessed as part of the 2017 TPAP.

4.9.10 Utilities

Potential effects on utilities during project construction activities generally include damage or disruption of those utilities not relocated in a timely fashion to allow OCS placement. The mitigation measure for this is to either move the conflicted utility prior to construction or coordinating construction scheduling accordingly with affected utilities.

4.9.11 EMI & EMF

Each layover facility will require significant electrical work to install either a sub-station or new transformer to provide power to the site, which includes significant grounding work. Electrical power will feed low voltage systems, separate from electrification power requirements, including lighting and all communication devices such as cameras and public address systems. Worker exposure to EMI & EMF through these sources will be mitigated in accordance with the protocols already established for construction sites.

4.9.11.1.1 Potential Effects and Mitigation Measures

There are no changes or additions to construction practices beyond what has already been assessed as part of the 2017 TPAP.

4.9.12 Stormwater Management

There are no changes or additions to construction practices beyond what has already been assessed as part of the 2017 TPAP. The management of stormwater during construction will be addressed as part of water-taking and sediment control measures.

4.9.13 Groundwater and Wells

There are no changes or additions to construction practices beyond what has already been assessed as part of the 2017 TPAP.

4.10 Summary of Mitigation and Monitoring Commitments

The following tables summarize the key Project components/activities, potential environmental effects, and commitments to mitigation measures, monitoring and future work identified through the GO Rail Network Electrification TPAP for each environmental component. For a comprehensive description of all commitments to be fulfilled by Metrolinx and Hydro One during the subsequent Detailed Design, construction and operational phases of the Project, refer to EPR Volume 5 (Morrison Hershfield & Gannett Fleming, 2017) as well as Section 6 below.

TABLE 4-123: SUMMARY OF VEGETATION REMOVAL MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring
OCS	• Tree removals	Vegetation Removal and Compensation Plans	• Tree / vegetation removal, injury and protection • Sedimentation and Erosion	• An Arborist Report will be prepared which meets regulatory requirements and is completed by an I.S.A. Certified Arborist. The report will also be completed with regard to the Ontario Forestry Act R.S.O. 1990, the Endangered Species Act, and other regulations, municipal By-laws and best management practices as applicable. • The Arborist Report will include, but not be limited to the individual identification of all trees within the Project Study Area including those that require removal or preservation, or trees that may be injured as a result of the Project. Trees to be identified within the Project Study Area will include those on Metrolinx property, trees on public and private lands, and boundary trees. Municipal by-laws will dictate the minimum Diameter at Breast Height (DBH) which requires inventory and additional requirements for tree inventories and tree protection plans. The Arborist Report will include all information needed to establish compensation ratios and tree end use (including identification of high value trees) as per the Metrolinx Vegetation Guideline (2020). • If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2020). Adhere to all applicable bylaws for tree removals outside of Metrolinx properties. • Pruning of branches will be conducted through the implementation of proper arboricultural techniques. • Adhere to relevant guidelines and OPSS for clearing and grubbing (OPSS 201), site preparation and tree protection (OPSS 801). • Tree Protection Zone (TPZ) fencing will be established to protect and prevent tree injuries in accordance with local by-law requirements. • Prior to the undertaking of tree removals, a Tree Removal Strategy, building upon the considerations and elements set out in the Metrolinx Vegetation Guideline (2020), will be developed and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections. • Compensation for tree removals will be undertaken in accordance with the Vegetation Compensation framework as documented in Metrolinx's Vegetation Guideline (2020). Adhere to all applicable bylaws for tree removals outside of Metrolinx properties. • Vegetation removals will also consider and mitigate potential impacts to sensitive species, e.g., migratory birds and Species at Risk (SAR), and features, e.g., Designated Natural Areas and Significant Wildlife Habitat. Refer to Natural Environment commitment tables for additional details.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. • The success of vegetation compensation activities will be monitored in accordance with Metrolinx's Vegetation Guideline (2020). The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning. • Monitoring requirements will be undertaken in accordance with conditions of permits and approvals. • Monitoring and management of trees/vegetation within the rail corridor right-of-way will be undertaken in accordance with the Integrated Vegetation Management (IVM) program within the Metrolinx *Vegetation Guideline* (2020).
			• Disturbance, injury and/or removal of SAR vegetation, including Butternut	• As part of the Arborist Report, all trees within or adjacent to the Project Study Area that will be removed or injured as part of the Project will be inventoried, including Butternut and any other SAR vegetation. SAR vegetation will be subject to permitting and approval requirements under Applicable Law, prior to the commencement of construction. • Each Butternut that may potentially be removed or impacted must be assessed by a qualified Butternut Health Assessor, in accordance with MNRF Butternut Assessment Guidelines (2014). The Assessor will prepare a Health Assessment Report for submission to MECP to determine the next course of action.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures.

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring

	• Tree removals
	• Installation of OCS
	  ○ Excavate soil
	  ○ Install OCS foundations at an approximate depth of 5m
	  ○ Erect poles
	  ○ Install wiring
			• Sedimentation and erosion
			• Generation of dust
			• Spills
				<u>Sediment and Erosion Control Measures:</u>
				• Adhere to relevant guidelines and Ontario Provincial Standard Specifications (OPSS) relating to proper sediment and erosion controls including consideration of TRCA[93] Erosion and Sediment Control Guide for Urban Construction (2019), Ontario Provincial Standards Specifications (OPSS) – OPSS 805 (Erosion and Sediment Control Measures).
				• Installation of silt fencing around all designated work areas to prevent any offsite transport of sediment.
				• Maintenance of existing vegetation on embankments as long as possible and stabilization of exposed areas as soon as possible by seeding and mulching.
				• Installation of appropriate lengths of silt fencing along the perimeter of minimized, designated work areas to limit construction impacts.
				• Removing all sediment and erosion controls once construction areas are stabilized.
				• Stockpiles to be located at a minimum of 30m from watercourses and isolated to ensure material will not enter any watercourse or ditchline. All stockpiles to be removed upon completion of the works and the site restored, as appropriate; and
				<u>Dust control measures</u>
				The contractor should adhere to relevant guidelines and Ontario Provincial Standard Specifications, including OPSS 506 (Dust Control).
				• Covering stockpiles with a tarp or seed.
				• Covering trucks hauling excess material.
				• Reducing travel speeds and minimizing haul distances.
				• Seeding/re-vegetating exposed soils.
				<u>Spill and leak precautions and clean-up measures</u>
				• An Emergency Preparedness and Response Plan will govern spill response.
				• Fuel transport should be conducted in compliance with the Transportation of Dangerous Goods Act.
				• All leaks or spills to be immediately reported to the Ministry of the Environment Conservation and Parks (MECP), Spills Action Centre at 1-800-268-6060.
				• Spill response materials should be available wherever hazardous materials are used or stored.
					• On-site inspection will be undertaken weekly and after rain events to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include alteration of activities to minimize impacts and enhance mitigation measures.
					• Reports documenting inspection will be prepared and recurring issues tracked.

	• Tree Removals	Integrated Vegetation Management (IVM)	• Footprint Impacts. • Potential for the establishment of invasive species and other incompatible species.	• An IVM Plan will be developed and implemented that is in adherence with the IVM framework outlined in the Metrolinx's *Vegetation Guideline* (2020). The Guideline's selection criteria will be used to assess the vegetation present as compatible or incompatible, and manage it, if necessary, in a way which meets safety needs in a timely manner, is sensitive to environmental conditions, and maximizes cost-effectiveness. • Where possible, storing excavated soils for a period of less than 45 days. • Reseeding soils with a native seed mix suited to the site conditions once they are replaced. • Cleaning equipment between sites to prevent the spread of invasive species. • Equipment should be cleaned between sites to prevent the spread of invasive species.	• The presence, density, and location of compatible and incompatible species will be monitored as per the frequency and methodology established in the Bi-Annual Monitoring component of the IVM framework. Bi-Annual Monitoring is made up of pre-treatment and post-treatment monitoring events that will be carried out via field, aerial, and high-rail vehicle or train surveys conducted by qualified specialists.

[93] As a Crown Agency, GO/Metrolinx is exempt from the Conservation Authorities Act and as such does not have a requirement to apply for and obtain permits from conservation authorities. Wherever possible, GO/Metrolinx will engage the conservation authority on specific projects (or components thereof) and will adhere to requirements when and where possible.

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring
	• Tree Removals	Tree Removal Strategy	• Potential for the spread of emerald ash borer, *Agrilus planipennis* (Fairmaire) associated with removal, handing and transport of ash trees • Potential for the spread of Asian Long-horned Beetle, *Anoplophora glabripennis*	• Removal of ash trees, or portions of ash trees, will be carried out in compliance with the Canada Food and Inspection Agency Directive *D-03-08: Phytosanitary Requirements to Prevent the Introduction into and Spread within Canada of the Emerald Ash Borer, Agrilus planipennis (Fairmaire)* (2014), as amended from time to time. To comply with this Directive, all Ash trees requiring removal, including any wood, bark or chips, will be restricted from being transported outside of the emerald ash borer regulated areas of Canada. Unless authorized by a Movement Certificate issued by the CFIA, moving these products out of the Regulated Area is prohibited. This is necessary to prevent the spread of the Emerald Ash Borer (EAB) to un-infested areas in other parts of Ontario and Canada. The Contractor must dispose of all wood at a registered waste facility. • Carrying out vegetation removals within the Regulated area for Asian Long-horn Beetle (associated with Kitchener Corridor segments only) within 12 genera identified as host trees in a manner that is complies with the Ministerial Order issued by the Federal Government in 2013 which identifies provisions and restrictions on the movement of trees, leaves, logs, lumber, and wood/wood chips from host species of the Asian Long-horned Beetle. Unless authorized by a Movement Certificate issued by the CFIA, moving of these products out of the Regulated areas is prohibited. The Contractor must be disposed of all wood at a registered Waste Facility. • Ensure precautions are being taken to minimize the spread of invasive species by cleaning equipment prior to moving sites.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts.
USRC Hydro One Conflicts	• Tree Removals related to the new and expanded Don Fleet Junction locations		• Footprint Impacts • Tree / vegetation removal, injury and protection related to the new and expanded Don Fleet Junction locations	• If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2020). Metrolinx will adhere to all applicable bylaws for tree removals outside of Metrolinx properties. • Pruning of branches will be conducted through the implementation of proper arboricultural techniques. • Prior to undertaking of tree removals, a Tree Removal Strategy, building upon the considerations and elements set out in the Metrolinx Vegetation Guideline (2020), will be developed and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections. • Vegetation removals will also consider and mitigate potential impacts to sensitive species, e.g., migratory birds and Species at Risk (SAR), and features, e.g., Designated Natural Areas and Significant Wildlife Habitat. Metrolinx is committed to continued consultation with the City of Toronto and TRCA.	•

***NOTES:**
Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time.
If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies

TABLE 4-124: SUMMARY OF NATURAL ENVIRONMENT MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring
		Wildlife and Wildlife Habitat			
OCS	• Tree removals • Installation of OCS o Excavate soil o Install OCS foundations at an approximate depth of 5m o Erect poles o Install wiring	Wildlife	• Disturbance, displacement or mortality of wildlife	• Prior to construction, investigation of the Project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken, as appropriate. • If wildlife is encountered, measures will be implemented to avoid destruction, injury, or interference with the species, and/or its habitat. For example, construction activities will cease or be reduced, and wildlife will be encouraged to move offsite and away from the construction area on its own. A qualified biologist will be contacted to define the appropriate buffer required from wildlife. • Yielding the right-of-way to wildlife around all construction equipment and vehicles, if it is safe to do so. • Advising workers to perform visual survey of machinery and work areas prior to commencing work since wildlife may be found basking or hiding on or under equipment, rocks, debris piles, etc. • Not allowing construction debris to accumulate on-site and on the soils surface but regularly cleaning up the site to reduce the possibility of wildlife using debris for shelter. • Protecting any wildlife incidentally encountered during construction. • Mitigation measures and consideration for wildlife movement and migration corridors shall be considered during Detail Design and construction.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts.
		Significant Wildlife Habitat (SWH)	• Disturbance or destruction of Migratory Butterfly Stopover Areas used by Monarch Butterflies.	• Opportunities to plant milkweed or forage vegetation outside of and within the rail Right-of-Way (ROW) will be undertaken, where possible, and in accordance with Metrolinx's *Vegetation Guideline* (2020). • If vegetation clearing will proceed when Monarch larvae may be present (April 1 to September 30), milkweed plants should be inspected for Monarch larvae prior to their removal. If larvae are present, they may be moved to a location that is suitable and safe under the direction of a qualified biologist. Monarch caterpillars may be moved to other milkweed plants; for other larval stages (i.e., eggs and chrysalis). Entire milkweed plants should be transplanted. • Provide mitigation measures for additional migratory butterfly species as required.	• Regular monitoring will be undertaken during construction to prevent unauthorized impacts to the Migratory Butterfly Stopover Areas.
		Snake/reptiles	• Disturbance or destruction of specialized habitat	• Avoid temporary stockpiling of debris in areas where snakes/reptiles may be attracted for gestation and/or hibernation. • Where project activity occurs adjacent to suitable specialized snake habitat (ex. Snake hibernacula), exclusionary fencing will be erected along the activity area to fully isolate the area of activity during the active season. In the event that exclusionary fencing cannot be installed, follow-up discussions with the Ministry of the Environment, Conservation and Parks (MECP) and the Ministry of Natural Resources and Forestry (MNRF) will be required to determine adequate alternative mitigation measure(s). • For areas where a hibernaculum feature requires removal to facilitate development, the exclusion fencing is to be installed during the active snake season and prior to any construction activities commencing to prevent snakes from entering the feature pre-removal. Any snakes encountered within the exclusion fencing will be relocated outside the fencing and within suitable habitat containing suitable vegetation cover/refuge by a qualified biologist in accordance with the required permit(s) in accordance with the MNRF's Reptile and Amphibian Exclusion Fencing (2013).	• Monitoring will be undertaken prior to construction to survey exclusionary fencing installation and regular monitoring during construction to survey for snakes/reptiles potentially trapped within exclusionary areas. • Continuous monitoring of hibernacula feature removal will be undertaken during activity.
		Migratory Breeding Birds and Nests	• Disturbance or destruction of migratory birds and/or nests.	• All works must comply with the *Migratory Birds Convention Act* (MBCA), including timing windows for the general nesting period (April 1st to August 31st in Ontario).	• Regular monitoring will be undertaken to confirm that activities do not encroach into nesting areas or disturb active nesting sites.

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring
				• If activities are proposed to occur during the general nesting period, a breeding bird and nest survey will be undertaken prior to required activities. Nest searches by a qualified biologist with experience conducting nest searches will be required no more than 48 hours prior to vegetation removal. • Active nests and eggs of protected migratory birds should not be destroyed at any time and site-specific mitigation should be developed in consultation with the Canadian Wildlife Service. • Nests and eggs of protected Species at Risk birds should not be destroyed at any time. If the nest of a protected Species at Risk must be damaged or destroyed, consultation with the appropriate regulatory agency is required and a permit under the Endangered Species Act or Species at Risk Act (federal lands only) may be necessary. • If a nest of a migratory bird (including a ground bird and/or nest) is found outside of this nesting period, it still receives protection.	
		Species at Risk (SAR)			
		General	• Habitat loss, disturbance and/or mortality to SAR.	• All requirements of the *Endangered Species Act* (ESA) and *Species at Risk Act* (SARA) will be met. Species-specific mitigation measures will be implemented based on any recommended studies undertaken prior to construction, and consultation with MECP/MNRF. • If SAR is present and conservation strategies have been developed by MNRF/MECP, the commitments in the recovery strategy will be followed. • Providing all workers with awareness training (e.g., factsheets) that address the existence of potential Species at Risk on-site, the identification of those species and proper actions when an individual is encountered and/or needs to be moved out of harm's way. • Prior to commencing work, inspecting each work site for individual SAR and any individuals found should be left to move on their own or moved properly out of harm's way in the direction they were heading. • Reporting all Species at Risk Sightings and encounters to the Natural Heritage Information Centre (NHIC) using the appropriate reporting form.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. • Species-specific monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA.
		Barn/Bank Swallow	• Habitat loss, disturbance and/or mortality to Barn and/or Bank Swallow.	• If construction activities are scheduled during the nesting season for Barn and/or Bank Swallow (April 1st to August 31st), a nest search will be undertaken by a qualified biologist to confirm that no Barn and/or Bank Swallow are nesting on structures or banks that may be affected by construction activities on or near these areas. If possible, the area will be netted prior to nesting season to dissuade use of these areas for nesting. • Where loss or disturbance cannot be avoided (e.g., due to work on bridges or banks), all requirements under the ESA will be met, including any registration, compensation, replacement structures and/or permitting requirements.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
		Chimney Swift	• Habitat loss, disturbance and/or mortality to Chimney Swift.	• If repair, maintenance or demolition of buildings/structures with suitable roosting/nesting habitat (e.g., chimneys) is to take place, targeted surveys for Chimney Swift will be completed by a qualified biologist as per the Bird Studies Canada Chimney Swift Monitoring Protocol (2009). • Repair, maintenance, or demolition of an identified roosting/nesting structure may constitute destruction of critical habitat and would be discussed in advance with the MECP and requirements of the ESA will be met. • Register activities for Chimney Swift under the ESA and consult with MECP to fulfil requirements the ESA and its associated regulations.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
		SAR Bats	• Habitat loss, disturbance and/or mortality to SAR Bats.	• Disturbance to bat roosting habitat will be avoided during the bat roosting period of April 1st to September 30th in accordance with MECP requirements.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring
					minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
OCS	• Tree removals • Installation of OCS - Excavate soil - Install OCS foundations at an approximate depth of 5m - Erect poles - Install wiring	Aquatic SAR	• Habitat loss, disturbance and/or mortality to aquatic SAR.	• Specific mitigation measures identified through the Aquatic Habitat and Fish Community Assessment, and/or any other studies, will be implemented. • If Aquatic SAR is present, design and construction will occur in accordance with MECP requirements. • Redside Dace are protected by the timing window of April 30th to September 31st. • Register activities that fall under the notice of activity for aquatic species for works within habitat of certain fish or mussels.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
		SAR Turtles	• Habitat loss, disturbance and/or mortality to SAR turtles.	• In areas identified as being potential SAR turtle habitat, in-water works will be scheduled to occur outside of the turtle overwintering period of October 1st to April 30th in any given year and in accordance with MECP requirements. • Prior to in-water works, in areas identified as being potential SAR turtle habitat, an inspection for turtles will be conducted. If a nesting turtle is found, the MECP will be notified immediately and a suitable buffer zone will be flagged around the site and that area will be protected from harm during the nesting season. • Stopping all construction activities that disturb or could harm the turtle if a turtle is encountered on site. If the turtle appears to be simply moving through the area, a worker trained in a safe handling of turtles should carefully move the turtle out of the work site to a safe and suitable location nearby. All turtle observations and relocations should be documented. • Stopping construction activities and allowing turtles to be allowed to finish nesting and leave the area on its own, if the turtle has already begun to nest, (i.e. digging and/or sitting in a nest pit).	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
		SAR Snakes	• Habitat loss, disturbance and/or mortality to SAR snakes.	• Please refer to the "Wildlife" environmental component within this table for applicable general mitigation measures.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
		Aquatic Environment			
OCS	• Tree removals • Installation of OCS - Excavate soil - Install OCS foundations at an approximate depth of 5m - Erect poles - Install wiring	Wetlands and Waterbodies	• Removal or impacts to wetland, aquatic and riparian vegetation; erosion and sedimentation to wetlands/waterbodies from construction; risk of contamination to wetlands/waterbodies as a result of spills.	• Construction activities will maintain the buffers established during the design phase to minimize potential negative impacts to wetlands and waterbodies. • Shorelines or banks disturbed by construction activities will be immediately stabilized by any activity associated with the project to prevent erosion and/or sedimentation, through re-vegetation with native species suitable for the site in adherence with the Metrolinx *Vegetation Guideline* (2020). • An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019), as amended from time to time, will be prepared prior to and implemented during construction to minimize the risk of sedimentation to the wetland or waterbody. • A Spill Prevention and Response Plan will be developed before work commences and implemented during construction to ensure procedures and policies are in place during construction to minimize impacts to wetlands or waterbodies. • In wetland areas where vernal pooling occurs, prior to dewatering isolated work areas, wildlife will be captured and relocated to suitable habitat outside of the work area.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include alteration of activities to minimize impacts and enhance mitigation measures.

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring
				• Prior to dewatering isolated work areas, fish will be captured and relocated to suitable habitat outside of the work area under a Licence to Collect Fish for Scientific Purposes from the MNRF. • Adhere to relevant guidelines and Ontario Provincial Standard Specifications relating to proper sediment and erosion controls including consideration of TRCA's Erosion and Sediment Control Guide for Urban Construction (2019) and Ontario Provincial Standards Specifications (OPSS) – OPSS 805 (Erosion and Sediment Control Measures). • Design and implement erosion and sediment controls to contain/isolate the construction zones, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment to any watercourses, and ensure sites are stabilized prior to removal following construction. • Limit access to waterbody and banks to protect riparian vegetation and minimize bank erosion. Shorelines or banks disturbed by construction activities will be immediately stabilized, through re-vegetation with native species suitable for the site. • Preparing an Emergency Preparedness and Response Plan to govern spill response. • Ensuring spill kits are on-site at all times for implementation in the event of an accidental spill during construction. • Operating, storing and maintaining all equipment and associated materials in a manner that prevents the entry of any deleterious substance to the waterbody. • Conducting fuel transport in compliance with the Transportation of Dangerous Goods Act. • Reporting all leaks or spills immediately to the Ministry of the Environment, Conservation and Parks (MECP), Spills Action Centre at 1-800-268-6060. • Undertaking an assessment by a qualified Fisheries Specialist to determine measures to avoid causing harm to fish and fish habitat, including aquatic species at risk to determine the need for DFO review. • Complying with all in-water works with the timing windows identified by MNRF. • Complying with OPSS 180 (Management of Excess Materials) and OPSS 182 (Environmental Protection for Construction in Waterbodies and on Waterbody Banks) during construction.	
OCS	• Tree removals • Installation of OCS - Excavate soil - Install OCS foundations at an approximate depth of 5m - Erect poles - Install wiring	Fish and Fish Habitat	• Potential for indirect, impacts to fish and fish habitat.	• All requirements of the *Fisheries Act* and the ESA will be met. • In the event that in-water and/or near water construction works are required, the restricted construction activity timing windows and appropriate mitigation measures will be followed, as identified in Applicable Law and through consultation with the relevant authorities including the Conservation Authority, MECP, MNRF and Fisheries and Oceans Canada (DFO).	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts.
		Turtles and Turtle Habitat	• Potential for impacts to turtles and/or turtle habitat.	• In addition to consideration of impacts to fish and respective construction timing windows, work within wetlands or waterbodies will also have to consider effects on turtles. Work is to be scheduled outside of the turtle overwintering period which occurs from October 1st to April 30th in any given year. Conduct turtle surveys prior to the work, as required.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts.

***Notes:**

Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time.
If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies.

TABLE 4-125: SUMMARY OF PRELIMINARY ENVIRONMENTAL SITE ASSESSMENT MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
Installation of OCS / Hydro One Infrastructure	• Subsurface work, such as excavation, during construction	Excavated Materials	• Disturbance of contaminated soils and/or groundwater during construction and/or excavation activities; • Improperly handled excess contaminated soil and/or groundwater pumped during dewatering (if any) has the potential to contaminate property and surface water. Respectively; and, • Without appropriate preventative measures, workers can be exposed to unacceptable levels of contamination during construction	• Remediation and/or implement management measures to address contaminated soils and/or groundwater during construction and long term O&M. Management measures will be carried out in accordance with applicable environmental legislation. • If dewatering is determined to be required during construction, an Erosion and Sediment Control Plan and Discharge/Mitigation Plan (if applicable) will be prepared and implemented for work near surface water features before construction starts. • Implement a site specific health and safety plan for construction workers based on the findings of the subsurface investigations. • Develop a Soil and Excavated Materials Management Plan for the handling, management and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the work. The plan will be overseen by a Qualified Person pursuant to Ontario Regulation 153/04 under the Environmental Protection Act (QP) and will comply with Ontario Regulation 406/19 (On-Site and Excess Soil Management – enacted into law on January 1, 2021), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices (April 2019, as amended) and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement, as applicable. • The Soil and Excavated Materials Management Plan will be reviewed and approved by Metrolinx prior to construction. • Implement and follow dust control measures during construction activities. • Implement spill management measures	• Where identified, contaminated soils and groundwater will be managed in accordance with applicable environmental legislation (i.e.; Ontario Environmental Protection Act, Ontario Regulation 347, Transportation of Dangerous Goods Act and Regulations, and Ontario Regulation 153/04). Remedial measures are to be developed following completion of the Environmental Site Assessment and subsurface investigation activities and are to be based on the specific construction and electrification infrastructure proposed for each site; • Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per Ontario Regulation 347 (as amended) and all Applicable Law.
Installation of OCS – Walkers Line Layover	• Subsurface work, such as excavation, during construction	Excavated Materials	• Disturbance of contaminated soils and/or groundwater during construction and/or excavation activities; • Improperly handled excess contaminated soil and/or groundwater pumped during dewatering (if any) has the potential to contaminate property and surface water. Respectively; and, • Without appropriate preventative measures, workers can be exposed to unacceptable levels of contamination during construction	• Prior to construction, a Phase II ESA (a preliminary sampling plan) is recommended at the proposed Walkers Line Layover site to assess the quality of the soils and groundwater in accordance with the current applicable MECP Standards. • If contamination is confirmed from previous sampling, further subsurface investigation (i.e. delineation – a detailed sampling plan) will be conducted to determine the extent of contamination and develop a remedial action plan (i.e. remediation program). • All excess soil that is to be removed from site should be managed following the Ontario Regulation (O. Reg.) 406/19 On-site and Excess Soil Management.	• Upon completion of remediation program, a confirmatory sampling will be conducted from the walls and floor of the excavation limits to ensure the cleanup result meets the current application MECP standard for proposed future land use. • The contractor must ensure that the excavated contaminated soils will be transported to an approved landfill for proper off-site disposal. • Any backfill material which is brought to the site during site cleanup to replace the removed contaminated soil must meet the current application MECP standard for proposed future land use and the information will be properly documented for future risk management perspective.
Installation of OCS – Unionville Storage Yard	• Subsurface work, such as excavation, during construction	Excavated Materials	• Disturbance of contaminated soils and/or groundwater during construction and/or excavation activities; • Improperly handled excess contaminated soil and/or groundwater pumped during dewatering (if any) has the potential to contaminate property and surface water. Respectively; and,	• It is recommended that, prior to the transfer of temporary easement sites to Project Co/Metrolinx, the Client to complete a baseline condition sampling for soil and groundwater (pre-construction assessment) to the extent of the construction boundaries and depth at the Unionville Storage Yard to determine the quality of soils for reuse and categorize the excess soils for proper off-site disposal, if applicable. • All excess soil that is to be removed from site should be managed following the Ontario Regulation (O. Reg.) 406/19 On-site and Excess Soil Management.	• A Soil and Excavated Material Monthly Dashboard Report will be developed by the Constructor for Metrolinx review that includes monitoring and performance data related to the management of excavated materials for the preceding month. • Upon completion of the construction, the Constructor (Project Co.) should conduct a post-construction assessment for soil and groundwater prior to transferring temporary easement sites back to the property owner.

			• Without appropriate preventative measures, workers can be exposed to unacceptable levels of contamination during construction		
Installation of OCS – Midland Layover	• Subsurface work, such as excavation, during construction	Excavated Materials	• Disturbance of contaminated soils and/or groundwater during construction and/or excavation activities; • Improperly handled excess contaminated soil and/or groundwater pumped during dewatering (if any) has the potential to contaminate property and surface water. Respectively; and, • Without appropriate preventative measures, workers can be exposed to unacceptable levels of contamination during construction	• Prior to construction, a Phase II ESA (a preliminary sampling plan) is recommended at the proposed Midland Layover site to assess the quality of the soils and groundwater in accordance with the current applicable MECP Standards. • If contamination is confirmed from previous sampling, further subsurface investigation (i.e. delineation – a detailed sampling plan) will be conducted to determine the extent of contamination and develop a remedial action plan (i.e. remediation program). • All excess soil that is to be removed from site should be managed following the Ontario Regulation (O. Reg.) 406/19 On-site and Excess Soil Management.	• Upon completion of remediation program, a confirmatory sampling will be conducted from the walls and floor of the excavation limits to ensure the cleanup result meets the current application MECP standard for proposed future land use. • The contractor must ensure that the excavated contaminated soils will be transported to an approved landfill for proper off-site disposal. • Any backfill material which is brought to the site during site cleanup to replace the removed contaminated soil must meet the current application MECP standard for proposed future land use and the information will be properly documented for future risk management perspective.
Operation/ Maintenance of OCS	• Operation of OCS • Tree pruning/maintenance	N/A	• Not applicable as no subsurface work is anticipated in association with the operation/maintenance of the OCS	• N/A	• N/A

***NOTES:**
Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time.
If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies

TABLE 4-126: SUMMARY OF BUILT HERITAGE RESOURCES AND CULTURAL HERITAGE LANDSCAPES MITIGATION AND MONITORING COMMITMENTS

Rail Corridors/ Segment	Environmental Component	Ref. Number	Type of Property	Location	Study Area Segment	Heritage Recognition	Potential Effect	Mitigation/Monitoring Commitments
Union Station Rail Corridor	Built Heritage Resources and Cultural Heritage Landscapes	BHR-1	Lower Sherbourne Street Subway	Mile 0.75, USRC East	USRC-2	Known BHR - Provincial Heritage Property	• Direct impacts are anticipated as a result of the construction of a proposed utility bridge adjacent to the south elevation of this bridge.[94] • Indirect impacts to the heritage attributes of this BHR are possible due to the proposed works, which may result in limited and temporary adverse vibration impacts to this BHR.	**Direct Impacts:** Preferred Option: Avoid alterations to this bridge. Alternative Option: Should it be determined that there is no other technically feasible option, complete an Heritage Impact Assessment (HIA) to determine appropriate site-specific mitigation measures. **Indirect Impacts:** To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Prior to construction, if it is found that there is potential adverse impacts to this BHR as a result of the vibration zone of influence, a qualified engineer should include this BHR in the condition assessment of structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken. For bridges anticipated to be directly impacted with the addition of the proposed Hydro One utility bridge, a SCP should be completed for this structure to guide impacts and mitigation measures.
		BHR-2	Parliament Street Subway	Mile 1.00, USRC East	USRC-3	Known BHR - Provincial Heritage Property	• Direct impacts are anticipated as a result of the construction of a proposed utility bridge adjacent to the south elevation of this bridge. • Indirect impacts to the heritage attributes of this BHR are possible due to the proposed works, which may result in limited and temporary adverse vibration impacts to this BHR.	**Direct Impacts:** Preferred Option: Avoid alterations to this bridge. Alternative Option: Should it be determined that there is no other technically feasible option, complete an HIA to determine appropriate site-specific mitigation measures. **Indirect Impacts:** To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Prior to construction, if it is found that there is potential adverse impacts to this BHR as a result of the vibration zone of influence, a qualified engineer should include this BHR in the condition assessment of structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken. For bridges anticipated to be directly impacted with the addition of the proposed Hydro One utility bridge, a SCP should be completed for this structure to guide impacts and mitigation measures.

[94] The utility bridge is to be affixed to the expanded Lower Sherbourne Street Subway bridge, as documented and approved in the 2018 Union Station Rail Corridor East Enhancements EPR.

Rail Corridors/ Segment	Environmental Component	Ref. Number	Type of Property	Location	Study Area Segment	Heritage Recognition	Potential Effect	Mitigation/Monitoring Commitments
		BHR-3	Cherry Street Subway	Mile 1.25, USRC East	USRC-3	Known BHR - Provincial Heritage Property	• Direct impacts are anticipated as a result of the construction of a proposed utility bridge adjacent to the south elevation of this bridge. • Indirect impacts to the heritage attributes of this BHR are possible due to the proposed works, which may result in limited and temporary adverse vibration impacts to this BHR.	**Direct Impacts:** Preferred Option: Avoid alterations to this bridge. Alternative Option: Should it be determined that there is no other technically feasible option, complete an HIA to determine appropriate site-specific mitigation measures. **Indirect Impacts:** To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Prior to construction, if it is found that there is potential adverse impacts to this BHR as a result of the vibration zone of influence, a qualified engineer should include this BHR in the condition assessment of structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken. For bridges anticipated to be directly impacted with the addition of the proposed Hydro One utility bridge, a SCP should be completed for this structure to guide impacts and mitigation measures.
		BHR-4	Cherry Street Tower	385 Cherry Street	USRC-3	Provincial Heritage Property of Provincial Significance	• No direct impacts to this BHR are anticipated. • Indirect impacts to the heritage attributes of this BHR are possible due to the proposed works, which may result in limited and temporary adverse vibration impacts to this BHR.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Prior to construction, if it is found that there is potential adverse impacts to this BHR as a result of the vibration zone of influence, a qualified engineer should include this BHR in the condition assessment of structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and immediately cease work if acceptable vibration thresholds are exceeded until the above has been undertaken.
		BHR-5	Eastern Avenue Bridge	Mile 1.84 of the Richmond hill Corridor, east of Corktown Common	USRC-4	Potential Built Heritage Resource	• No direct or indirect impacts to this property are anticipated as a result of the proposed work.	• No further work required.
		CHL-1	Distillery District Proposed Heritage Conservation District	Border is Parliament Street to the west, railway corridor to the south, Cheery Street to the East and the	USRC-3	Potential Cultural Heritage Landscape – Proposed Part V Designation	• No direct or indirect impacts to this property are anticipated as a result of the proposed work.	• No further work required.

Rail Corridors/ Segment	Environmental Component	Ref. Number	Type of Property	Location	Study Area Segment	Heritage Recognition	Potential Effect	Mitigation/Monitoring Commitments
				buildings on the north side of Mill St. to the north				
		CHL-2	Bala Underpass Public Space: Commemorative Plaques and 1856 abutments stones as commemorative features	West back of the Don river, don River Bicycle Trail just eat of the Corktown Comms at the Bala Underpass	USRC-4		• No direct or indirect impacts to this property are anticipated as a result of the proposed work.	• No further work required.
Barrie Rail Corridor		BR-05	Residence	365 Cotter Street, Newmarket	BR-7	Potential BHR – Identified during field review	• No direct impacts to this BHR resulting from the project footprint, construction activities, or operations and maintenance activities, are anticipated. • Indirect impacts to the heritage attributes of this BHR are possible due to the construction of the additional OCS infrastructure. In particular, the construction activities associated with OCS infrastructure may result in limited and temporary adverse vibration impacts to this BHR. The structure on this property is located approximately 18 m from the Metrolinx right-of-way.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts, the following options should be considered for implementation: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx should make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and such works should immediately cease if acceptable vibration thresholds are exceeded and until the above recommendations have been implemented.
		BR-06	Residence	359 Cotter Street, Newmarket	BR-7	Potential BHR – Identified during field review	• No direct impacts to this BHR resulting from the project footprint, construction activities, or operations and maintenance activities, are anticipated. • Indirect impacts to the heritage attributes of this BHR are possible due to the construction of the additional OCS infrastructure. In particular, the construction activities associated with OCS infrastructure may result in limited and temporary adverse vibration impacts to this BHR. The structure on this property is located approximately 18 m from the Metrolinx right-of-way.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts, the following options should be considered for implementation: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx should make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and such works should immediately cease if acceptable vibration thresholds are exceeded and until the above recommendations have been implemented.
		BR-07	Residence	353 Cotter Street, Newmarket	BR-7	Potential BHR – Listed on a Municipal Heritage Register	• No direct impacts to this BHR resulting from the project footprint, construction activities, or operations and maintenance activities, are anticipated. • Indirect impacts to the heritage attributes of this BHR are possible due to the construction of the additional OCS infrastructure. In particular, the construction activities associated with OCS infrastructure may result in limited and temporary adverse vibration impacts to this BHR.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts, the following options should be considered for implementation: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property.

Rail Corridors/ Segment	Environmental Component	Ref. Number	Type of Property	Location	Study Area Segment	Heritage Recognition	Potential Effect	Mitigation/Monitoring Commitments
							The structure on this property is located approximately 20 m from the Metrolinx right-of-way.	• Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx should make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and such works should immediately cease if acceptable vibration thresholds are exceeded and until the above recommendations have been implemented.
		BR-08	Residence	349 Cotter Street, Newmarket	BR-7	Potential BHR – Identified during field review	• No direct impacts to this BHR resulting from the project footprint, construction activities, or operations and maintenance activities, are anticipated. • Indirect impacts to the heritage attributes of this BHR are possible due to the construction of the additional OCS infrastructure. In particular, the construction activities associated with OCS infrastructure may result in limited and temporary adverse vibration impacts to this BHR. The structure on this property is located approximately 20 m from the Metrolinx right-of-way.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts, the following options should be considered for implementation: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx should make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and such works should immediately cease if acceptable vibration thresholds are exceeded and until the above recommendations have been implemented.
		BR-09	Residence	341 Cotter Street, Newmarket	BR-7	Potential BHR – Identified during field review	• No direct impacts to this BHR resulting from the project footprint, construction activities, or operations and maintenance activities, are anticipated. • Indirect impacts to the heritage attributes of this BHR are possible due to the construction of the additional OCS infrastructure. In particular, the construction activities associated with OCS infrastructure may result in limited and temporary adverse vibration impacts to this BHR. The structure on this property is located approximately 17 m from the Metrolinx right-of-way.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts, the following options should be considered for implementation: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx should make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and such works should immediately cease if acceptable vibration thresholds are exceeded and until the above recommendations have been implemented.
		BR-12	Various	115-117 Main Street South, Newmarket	BR-7	Known BHR – Part IV Designation under the OHA (By-law 1988-143)	• No direct or indirect impacts to the potential heritage attributes associated with this BHR are anticipated as a result of the additional OCS infrastructure. • The historical residential structure identified in the heritage designation by-law is situated approximately 90 m from the Metrolinx right-of-way. The historical structure is part of a larger townhouse complex and is visually set apart from the Metrolinx right-of-way by a row of modern townhouses and associated parking lots.	• No further work is required.

Rail Corridors/ Segment	Environmental Component	Ref. Number	Type of Property	Location	Study Area Segment	Heritage Recognition	Potential Effect	Mitigation/Monitoring Commitments
		BR-13	Municipal	450-474 Davis Drive East, Newmarket	BR-7	Known BHR – Part IV Designation under the OHA (By-law 1987-110/2017-42); Formerly designated under the Heritage Railway Station Protection Act	• No direct impacts to this BHR resulting from the project footprint, construction activities, or operations and maintenance activities, are anticipated. • Indirect impacts to the heritage attributes of this BHR are possible due to the construction of the additional OCS infrastructure. In particular, the construction activities associated with the new OCS infrastructure may result in limited and temporary adverse vibration impacts to the former Canadian National Railway Station, which sits approximately 3 m from the proposed new track	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts, the following options should be considered for implementation: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx should make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and such works should immediately cease if acceptable vibration thresholds are exceeded and until the above recommendations have been implemented.
		BR-14	GO Station	465 Davis Drive, Newmarket	BR-7	Known BHR; MHC determined it met *Ontario Regulation* 9/06; also listed on a Municipal Heritage Register - Metrolinx Provincial Heritage Property (of local significance)	• No direct impacts to this BHR resulting from the project footprint, construction activities, or operations and maintenance activities, are anticipated. • Indirect impacts to the heritage attributes of this BHR are possible due to the construction of the additional OCS infrastructure. In particular, the construction activities associated with new OCS infrastructure may result in limited and temporary adverse vibration impacts to the former tannery building (since repurposed into a mall and GO Station), which sits approximately 4 m from the proposed new track.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts, the following options should be considered for implementation: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx should make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and such works should immediately cease if acceptable vibration thresholds are exceeded and until the above recommendations have been implemented.
		BR-15	Residence	91 Franklin Street, Newmarket	BR-7	Known BHR; MHC determined it met *Ontario Regulation* 9/06.	• No direct impacts to this BHR resulting from the project footprint, construction activities, or operations and maintenance activities, are anticipated. • Indirect impacts to the heritage attributes of this BHR are possible due to the construction of the additional OCS infrastructure. In particular, the construction activities associated with OCS infrastructure may result in limited and temporary adverse vibration impacts to this BHR. The structure on this property is located approximately 30 m from the Metrolinx right-of-way.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts, the following options should be considered for implementation: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx should make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and such works should immediately cease if acceptable vibration thresholds are exceeded and until the above recommendations have been implemented.

Rail Corridors/ Segment	Environmental Component	Ref. Number	Type of Property	Location	Study Area Segment	Heritage Recognition	Potential Effect	Mitigation/Monitoring Commitments
		BR-16	Residence	95 Franklin Street, Newmarket	BR-7	Potential BHR – Identified during field review	• No direct impacts to this BHR resulting from the project footprint, construction activities, or operations and maintenance activities, are anticipated. • Indirect impacts to the heritage attributes of this BHR are possible due to the construction of the additional OCS infrastructure. In particular, the construction activities associated with OCS infrastructure may result in limited and temporary adverse vibration impacts to this BHR. The structure on this property is located approximately 30 m from the Metrolinx right-of-way.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts, the following options should be considered for implementation: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx should make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and such works should immediately cease if acceptable vibration thresholds are exceeded and until the above recommendations have been implemented.
		BR-18	Mixed Use	33 Essa Road, Barrie	BR-12	Potential BHR – Identified during field review	• No direct impacts to this BHR resulting from the project footprint, construction activities, or operations and maintenance activities, are anticipated. • Indirect impacts to the heritage attributes of this BHR are possible due to the construction of the additional OCS infrastructure. In particular, the construction activities associated with OCS infrastructure may result in limited and temporary adverse vibration impacts to this BHR. The structure on this property is located approximately 5 m from the Metrolinx right-of-way.	To ensure this property is not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure on this property will be subject to vibration impacts, the following options should be considered for implementation: • Preferred Option: Plan construction activities to avoid adverse vibration impacts to the structure on this property. • Alternative Option: Should it not be feasible to avoid adverse vibration impacts to the structure on this property, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx should make a commitment to repair any damages caused by vibrations. The area should be monitored for vibration impacts during construction, and such works should immediately cease if acceptable vibration thresholds are exceeded and until the above recommendations have been implemented.
		BR-23	Residence	65 Tiffin Street, Barrie	BR-12	Potential BHR – Identified during field review	• No direct or indirect impacts to the heritage attributes associated with this potential BHR are anticipated. The residence on this property is located approximately 35 m from the Metrolinx right-of-way.	• No impacts are expected. No further work is recommended.
		BR-24	Residence	69 Tiffin Street, Barrie	BR-12	Potential BHR – Identified during field review	• No direct or indirect impacts to the heritage attributes associated with this potential BHR are anticipated. The residence on this property is located approximately 35 m from the Metrolinx right-of-way.	• No impacts are expected. No further work is recommended.
All Corridors							• Indirect or direct impacts to the heritage attribute(s) of a property of known or potential Cultural Heritage Value or Interest (CHVI) due to installation of new/modified infrastructure	• All work shall be performed in accordance with Applicable Law, including but not limited to the *Ontario Heritage Act*, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) *Standards and Guidelines for Provincial Heritage Properties: Metrolinx Identification and Evaluation (I&E) Process* (2014), the MHSTCI guidance on *Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment* (2019) (Cultural Heritage Report), and the forthcoming *Standards and Guidelines for Provincial Heritage Properties: Metrolinx Identification and Evaluation (I&E) Process* (2020). In the event that the *Metrolinx I&E Process* (2020) is not

Rail Corridors/ Segment	Environmental Component	Ref. Number	Type of Property	Location	Study Area Segment	Heritage Recognition	Potential Effect	Mitigation/Monitoring Commitments
								approved, follow the Metrolinx *Interim Cultural Heritage Management Process* (2013). • Follow the process and recommendations outlined in the Environmental Project Reports (EPR) under Transit Project Assessment Process (TPAP) for Proponents and their Consultants. • Follow the recommendations outlined in the heritage reporting completed including the Cultural Heritage Report and/or the Heritage Impact Assessment (HIA). • For known and potential properties of Cultural Heritage Value or Interest (CHVI) that will experience indirect or direct impacts and where no previous assessment has been completed or a Statement of Cultural Heritage Value (SCHV) has not been approved by Metrolinx, undertake a Cultural Heritage Evaluation Report (CHER) as per the forthcoming *Metrolinx I&E Process* (2020). In the event that the *Metrolinx I&E Process* (2020) is not approved, follow the Metrolinx *Interim Cultural Heritage Management Process* (2013). • Given the importance and location of some Cultural Heritage Resources, consultation with Municipal heritage staff and other jurisdictions will be undertaken as appropriate to determine if proposed infrastructure will be subject to specific policies within heritage districts or conservation areas (including parks). • Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or Environmental Study Reports (ESRs) and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, Cultural Heritage Assessment Reports (CHARs), CHERs, HIAs and Strategic Conservation Plans (SCPs).
							• Direct impacts to the heritage attribute(s) of a known or potential Provincial Heritage Property (PHP) or Provincial Heritage Properties of Provincial Significance (PHPPS) due to installation of new/modified infrastructure	• Where no previous assessment has been completed or a SCHV has not been approved by Metrolinx, undertake a CHER as per the forthcoming *Metrolinx I&E Process* (2020). In the event that the *Metrolinx I&E* Process (2020) is not approved, follow the Metrolinx *Interim Cultural Heritage Management Process* (2013). • If warranted, complete a HIA in accordance with MHSTCI *Information Bulletin No. 3: Heritage Impact Assessments for Provincial Heritage Properties* (2017) to identify alternatives and mitigation and monitoring commitments to avoid or lessen impacts on the Cultural Heritage Value and heritage attributes of the PHP, based on the PHP's SCHV. Mitigation measures and alternatives should be consistent with the relevant conservation strategies established and adopted in a SCP. A SCP will be prepared and implemented for PHPs and PHPPS. • Approval will be obtained from the MHSTCI, for any modifications to Provincially Significant properties prior to construction. • During design, the recommendations of all HIAs and Cultural Heritage Reports will be followed and adhered to during design and construction, including but not limited to strategies to protect heritage attributes. • If the project study limits change or there is a change in impact that is not captured or documented in previously completed Metrolinx and/or GO Transit EPRs and/or ESRs post EA/TPAP, and which causes any additional heritage properties to be impacted by the proposed design/infrastructure, all applicable legislation will be followed to carry out additional impact assessment work and heritage studies to identify any known or potential built heritage resources and cultural heritage

Rail Corridors/ Segment	Environmental Component	Ref. Number	Type of Property	Location	Study Area Segment	Heritage Recognition	Potential Effect	Mitigation/Monitoring Commitments
								landscapes, and to identify potential impacts and appropriate mitigation measures. Given the importance and location of some Cultural Heritage Resources, consultation with Municipal heritage staff and other jurisdictions will be undertaken as appropriate to determine if proposed infrastructure will be subject to specific policies within heritage districts or conservation areas (including parks). • Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHARs, CHERs, HIAs and SCPs
							• Potential indirect impacts on known or potential properties of CHVI resulting from construction activities	• Selection of construction staging and laydown areas will follow Metrolinx's selection procedures which include avoiding heritage attributes wherever possible or effectively mitigating impacts where not possible. • Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHARs, CHERs, HIAs and SCPs.
							• For any additional potentially affected Built Heritage Resources and Cultural Heritage Landscapes /properties not previously identified within a previous Metrolinx/GO Transit EA/TPAP/Other Study	• If the project study limits change or there is a change in impact that is not captured or documented in previously completed Metrolinx and/or GO Transit EPRs and/or ESRs post EA/TPAP, and which causes any additional heritage properties to be impacted by the proposed design/infrastructure, all applicable legislation will be followed to carry out additional impact assessment work and heritage studies to identify any known or potential built heritage resources and cultural heritage landscapes, and to identify potential impacts and appropriate mitigation measures. • Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHARs, CHERs, HIAs and SCPs.
							• Management of Built Heritage Resources / Properties	• Develop and implement a SCP that addresses built heritage resources and cultural heritage landscapes according to MHSTCI *Information Bulletin No. 2: Preparing Strategic Conservation Plans for Provincial Heritage Properties* (2017) and as outlined in the Project Agreement. • For PHPPS, approval of the MCP and SCP by MHSTCI is required. • Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHARs, CHERs, HIAs and SCPs

Rail Corridors/ Segment	Environmental Component	Ref. Number	Type of Property	Location	Study Area Segment	Heritage Recognition	Potential Effect	Mitigation/Monitoring Commitments
							• Demolition, removal, or relocation of a Metrolinx PHPPS (part or whole)	• In the case of properties identified as PHPPS and where the proposed project infrastructure will require demolition or removal and/or transfer out of provincial control, Metrolinx will need to obtain MHSTCI Minister's consent. • The Minister's Consent Package will be prepared which meets MHSTCI requirements and satisfy Metrolinx's obligations under the *Ontario Heritage Act*. • Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHARs, CHERs, HIAs and SCPs

***NOTES:**
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If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies

TABLE 4-127: SUMMARY OF ARCHAEOLOGICAL MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
OCS/ Underground Transmission Corridor	• Excavate soil • Install OCS foundations at an approximate depth of 5m • Excavation for the proposed Hydro One transmission corridor reaching a depth of 76m ASL • Erect poles • Install wiring • Tree removals	Archaeological Resources	• Potential for the disturbance/displacement of unassessed or documented archaeological resources. • Archaeological potential at the following locations along the rail corridors: o Barrie Rail Corridor - Potential for the disturbance of unassessed or documented deeply buried archaeological resources within a 200 metre radius of Allandale site (BcGw-69) near Historic Allandale Station and new Allandale Waterfront GO Station • Archaeological potential at the following locations within the USRC Hydro One Conflicts study area: o Within the area indicated in **Figure 4-5** below a depth of 76m ASL. o The Knapp's Roller Boat.	• Stage 2 Test Pit Survey will be undertaken during detailed design at the following site prior to construction: o Lakeshore West Rail Corridor (Walkers Line Layover) o Barrie Rail Corridor - Potential for the disturbance of unassessed or documented deeply buried archaeological resources within a 200 metre radius of Allandale site (BcGw-69) near Historic Allandale Station and new Allandale Waterfront GO Station • The Constructor will develop and implement an Archaeological Risk Management Plan that addresses any recommendations resulting from Archaeological Assessments and documents all protocols for the discovery of human remains and undocumented archaeological resources. The Archaeological Risk Management Plan shall be amended to incorporate any additional actions required resulting from subsequent Archaeological Assessment Reports. • All work shall be performed in accordance with Applicable Law, including but not limited to the *Ontario Heritage Act*, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), formerly the Ministry of Tourism, Culture and Sport (MTCS) *Standards and Guidelines for Consultant Archaeologists* (2011), and the MHSTCI document, *Engaging Aboriginal Communities in Archaeology: A Draft Bulletin for Consultant Archaeologists in Ontario* (2011). • In the event that archaeological resources are encountered or suspected of being encountered during construction, all work will cease. The location of the findspot should be protected from impact by employing a buffer in accordance with requirements of the MHSTCI. A professionally licensed archaeologist will be consulted to complete the assessment. If resources are confirmed to possess cultural heritage value/interest then they will be reported to the MHSTCI, and further Archaeological Assessment of the resources may be required. If it is determined that there is a potential for Indigenous artifacts, Metrolinx should be contacted and Applicable Law will be followed. • If final limits of the Project footprint are altered and fall outside of the assessed study area, additional Archaeological Assessments will be conducted by a professionally licensed archaeologist prior to disturbance and prior to construction activities. This will include completing all required Archaeological Assessments resulting from the Stage 1 Archaeological Assessment (Stage 2, Stage 3 and Stage 4, as required) as early as possible, prior to the completion of design, and in advance of any ground disturbance. • For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, additional Archaeological Assessment will be conducted by a professionally licensed archaeologist prior to disturbance. • If human remains are encountered or suspected of being encountered during project work, all activities must cease immediately and the local police/coroner as well as the Bereavement Authority of Ontario on behalf of the Ministry of Government and Consumer Services must be contacted. Archaeological investigations of human remains will not proceed until police have confirmed the remains are not subject to forensic investigation. Once human remains have been cleared of police concern, the MHSTCI will also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*. If the human remains are determined to be of Indigenous origin, Metrolinx should be contacted and all Applicable Law must be adhered to. • All Archaeological Assessment findings will be shared with Indigenous Nations & organizations, as per Metrolinx's *Guide to Engaging with Indigenous Communities* (2020). • Should the proposed work within the USCR Hydro One Conflicts study area extend beyond the current study area or should changes to the project design or temporary workspace requirements result in the inclusion of previously un-surveyed lands, these lands should be subject to a Stage 2 Archaeological Assessment. • The Waterfront Toronto: Archaeological Conservation and Management Strategy shall be consulted prior to construction and all work shall be performed in accordance with applicable strategies.	• Stage 2 Test Pit Survey will be undertaken during detailed design at the following site prior to construction: o Lakeshore West Rail Corridor (Walkers Line Layover) o Barrie Rail Corridor - Potential for the disturbance of unassessed or documented deeply buried archaeological resources within a 200 metre radius of Allandale site (BcGw-69) near Historic Allandale Station and new Allandale Waterfront GO Station • Engage with Indigenous Nations & organizations per the S&G and any consultation agreements • Performance of the work will occur within land previously subject to an Archaeological Assessment. • Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities in the event that an archaeological resource is encountered. • Further Archaeological Assessment may identify the need for monitoring during construction. • Should the proposed construction of the USRC Hydro One underground transmission corridor reach a depth of 76m ASL, Stage 2 Monitoring will be required
			• Potential to impact cemetery located in proximity to the Project footprint.	• Work in proximity to known cemeteries requires completion of an Archaeological Assessment prior to any proposed ground disturbance in accordance with the MHSTCI's *Standards and Guidelines for Consultant Archaeologists* (2011) and the *Funeral, Burial, and Cremation Services Act* and regulations under that Act.	• Further Archaeological Assessment may identify the need for monitoring during construction.
Operation/ Maintenance of OCS	• Operation of OCS • Tree Pruning/ Maintenance		• No potential effects associated with operation of the OCS	• None Required	• None Required

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TABLE 4-128: SUMMARY OF LAND USE/SOCIO-ECONOMIC MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring
OCS / Layovers	• Excavate soil • Install OCS foundations at an approximate depth of 5m • Erect poles • Install wiring • Tree removals	Property	• Property acquisition – permanent and temporary	• Specific property requirements will be confirmed during design. Where access to property is required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures. • Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that minimize adverse effects to sensitive receivers. • Further coordination (which may include a series of meetings, discussions, and agreements) with municipalities and property owners will be undertaken during Detailed Design to finalize design details and minimize any conflicts on adjacent uses. • Adhere to mitigation plans in Visual Impact Assessment, Natural Environment Impact Assessment and Air Quality and Noise Impact Assessment reports.	• Follow Metrolinx guidance with respect to monitoring requirements at construction staging/laydown areas.
		All land uses and adjacent lands	• Nuisance effects from construction activities	• Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables. • An Erosion and Sediment Control Plan will be developed in accordance with the Greater Golden Horseshoe Area Conservation Authorities' *Erosion and Sediment Control Guideline for Urban Construction* (December, 2006), as amended from time to time, that addresses sediment release to adjacent properties and roadways. • Develop a Communications Protocol in accordance with the Project Agreement, which will indicate how and when surrounding property owners and tenants will be informed of anticipated upcoming construction works, including work at night, if any. • Develop a Complaints Protocol in accordance with the Project Agreement • Adhere to mitigation plans in Visual Impact Assessment and Natural Environment Impact Assessment reports. Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.	• When applicable, monitoring related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables. • Erosion and sediment control monitoring to be conducted as per Project Agreement. • Number and resolution of complaints received. • Additional consultation during the Detailed Design and construction phases to ensure that local businesses and properties owners are aware of construction scheduling and that staging options can be developed to minimize impacts to local access and travel patterns to the extent possible.
			• Land use and access disruption	• Provide well connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours where required. • Provide temporary lighting and wayfinding signs and cues for navigation around the construction site. • Develop a plan to reduce the effects of light pollution in accordance with the Project Agreement. • Access to businesses during working hours will be maintained, where feasible. Where regular access cannot be maintained, alternative access and signage will be provided. • For layover facilities, ensure that proper fencing is erected prior to any earth moving, clearing or construction in order to prevent encroachment. • Adhere to mitigation plans in Visual Impact Assessment, Natural Environment Impact Assessment and Air Quality and Noise Impact Assessment reports. Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.	• Temporary access paths, walkways, cycling routes and fencing should be monitored. • Number and resolution of complaints received.
		Visual Characteristics	• Visual effects from construction areas/activities	• A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas. • Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary. • Adhere to mitigation plans in Visual Impact Assessment Report. Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.	• Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified areas. • Additional consultation during the Detailed Design and construction phases to ensure that local businesses and properties owners are aware of construction scheduling and that staging options can be developed to minimize impacts to local access and travel patterns to the extent possible.
		Light Pollution	• Light trespass, glare and light pollution effects	• Comply with all local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting in areas near or adjacent to highways and roadways regarding outdoor lighting for both permanent and temporary construction activities, and incorporate industry best practices provided in *ANSI/IES RP-8-18 – Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting*, as described in the Project Agreement • The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.	• Number and resolution of complaints received.

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring
		Public Transit	• Construction may result in access restrictions to local bus routes and temporary disruptions to the existing rail corridor	• Ensure that the public is notified in advance of any potential service disruptions. • Consult with local transit agencies to establish a suitable mitigation strategy to be implemented.	• Traffic impacts to be monitored in accordance with the Construction Traffic Control and Management Plan and adjusted as necessary during the construction period. • Cycling network impacts to be monitored in accordance with the Construction Traffic Control and Management Plan and adjust as necessary during the construction period.
		Traffic	• Construction may result in the need for temporary road or lane closures changing access to nearby land uses	• Traffic Control and Management Plan(s) will be developed prior to construction to maintain reasonable access through work zones, to the extent possible. • Access to nearby land uses will be maintained to the extent possible. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur. • Potential effects to pedestrian and cyclist activities during construction will be mitigated through the installation of appropriate wayfinding, regulatory, and warning signs. • Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion.	• Traffic impacts to be monitored in accordance with the Traffic Control and Management Plan and adjust as necessary during the construction period. • Additional consultation during the Detailed Design and construction phases to ensure that local businesses and properties owners are aware of construction scheduling and that staging options can be developed to minimize impacts to local access and travel patterns to the extent possible.
USRC Hydro One Conflicts	• Construction of an underground utility corridor • Construction of utility bridges • Construction of the new and expanded Don Fleet JCT	All land uses and adjacent lands	• Construction of the new and expanded Don Fleet JCT has the potential to impact the Lower Don Trail. • Nuisance effects from construction activities	• Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables 4-134 and 4-135. • It is anticipated that the Lower Don Trail will be closed during construction due to public safety reasons. If possible, an alternative temporary detour will be provided for the duration of construction. • Metrolinx will coordinate internally to develop a trail diversion/detour plan will be prepared for the Lower Don Trail prior to construction and trail closure. • Fencing/gates will provide separation between Lower Don Trail users and construction activities. • The City of Toronto Parks, Forestry and Recreation Department and Ward Councilors will be notified prior to release of a public notice for construction. • Following construction, the Lower Don Trail will be re-opened for public use to maintain accessibility and connectivity within the City of Toronto and surrounding parklands. • If the Lower Don Trail is directly impacted due to construction activities, it will be rehabilitated and brought to current City standards. Trail closures will be coordinated with planned trail improvements, to the extent possible. • Utility bridges will be designed in a way to prevent/minimize ice accretion and water build up, to ensure safety for pedestrians passing under the structures along Lower Sherbourne Street, Parliament Street, and Cherry Street. • Metrolinx will provide a connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours where required, during the construction of the underground utility corridor and installation of utility bridges along Lower Sherbourne Street, Parliament Street, and Cherry Street. • Metrolinx will engage with the City of Toronto to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.	• Develop a Construction Management Plan and Traffic Management Plan prior to construction and circulate to local municipalities/road authorities for review and discussion. • A Communication and Complaints Protocol will be developed prior to and implemented during construction. • Additional consultation during construction phases to ensure that local businesses and properties owners are aware of construction scheduling and that staging options can be developed to minimize impacts to local access and travel to the extent possible. • A Construction Monitoring Plan will be developed that identifies site-specific mitigation measures to be enacted before work begins. Mitigation measures contained within the plan will be regularly monitored during construction. • Temporary access paths, walkways, cycling routes and fencing should be monitored. • Continuing evaluation of the progress and potential effects of the proposed infrastructure.

***NOTES:**
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TABLE 4-129: SUMMARY OF AIR QUALITY MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
OCS	• Excavate soil • Install OCS foundations at an approximate depth of 5m • Erect poles • Install wiring • Tree removals	Air Quality - Construction	Construction related air pollution may pose risks to human health and wellbeing	• Prior to commencement of construction, develop and implement a detailed Construction Air Quality Management Plan (AQMP). The AQMP will: o Demonstrate compliance with the specific air quality criteria and limits in the Metrolinx *Environmental Guide for Air Quality and Greenhouse Gas Emissions Assessment* (2019). o Define the Project's air quality impact zone and identify all sensitive receptors within this area. o Assess the baseline air quality by continuous measurement of local ambient concentrations of $PM_{2.5}$ and PM_{10} over a minimum period of one week, where large local sources of pollution, such as highways, directly affect the zone of influence of the Project. o Estimate and document the predictable worst-case air quality impacts of the Project on sensitive receptors within the air quality impact zone, develop appropriate mitigation measures, demonstrate their effectiveness, and commit to their timely implementation. o Monitor continuously any contaminant, in addition to $PM_{2.5}$ and PM_{10}, which is predicted to exceed its relevant air quality exposure criterion during any phase of the Project and at any receptor. o Include explicit commitment to the implementation of all applicable best practices identified in the Environment Canada document, *Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities* (2005). • Develop a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.	• Develop and implement Weekly Air Quality Monitoring Plans that document how air quality monitoring has been conducted and compliance assessed to effectively prevent unacceptable rates of air emissions in accordance with the following guidelines: o The construction related air contaminants of primary concern are in the form of particulate matter, with the principal construction related fractions of $PM_{2.5}$ and PM_{10} - particulate matter of less than 2.5 and 10 micron in diameter, respectively. Other contaminants of concern include crystalline silica and oxides of nitrogen. The list of contaminants will be expanded with any and all air pollutants that may be produced as a result of the work. o The criteria for $PM_{2.5}$, PM_{10} and crystalline silica are provided in Metrolinx's Environmental Guide for Air Quality and Greenhouse Gas Emissions Assessment (2019). The applicable criteria for all other air contaminants of concern are to be found in the various schedules of Ontario Regulation 419/05. • Siting of the monitors should generally follow the guidelines provided in the Ministry of the Environment, Conservation and Parks (MECP) Operations Manual for Air Quality Monitoring in Ontario (2018).
		Air Quality – Operational	Exhaust emissions of diesel powered trains contribute to local and regional air pollution	<u>Mitigation Measures</u>: • A detailed Operations Air Quality Management Plan will be developed and implemented to limit the generation and dispersion of airborne particulate matter, NO_x and other air contaminants associated with the project operations. • New traction engines or propulsion systems and new auxiliary engines and power units will meet higher emission standards (i.e., Tier 4 diesels rather than lower tier diesels). • Engines and their emission control equipment will be maintained to manufacturers' specifications. • Rebuilt diesel engines will meet Tier 4 emission standards at the time of major engine rebuilds.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. • Annually, test train propulsion and auxiliary power units, which produces exhaust emissions and ensure that they remain in compliance with applicable Transport Canada heavy-duty diesel engine exhaust emission standards for CO, PM, NO_x and HC. Engine testing will include:

				• Unnecessary train / engine / propulsion system idling will be minimized through technical and operational measures. • Unnecessary non-revenue equipment runs will be minimized through design and planning. <u>Mitigation Criteria</u>: • Diesel engines used for traction and auxiliary power in locomotives and DMUs are subject to corresponding US EPA and Transport Canada heavy-duty diesel engine exhaust emission standards for CO, PM, NOx and HC	o Testing at no load o Testing at 50% load o Testing at 100% load • Test rebuilt traction and auxiliary power diesel engines, before being placed into service, to the exhaust emission standards they are rebuilt to meet. • Develop an Air Sampling and Monitoring Plan and submit an annual report summarizing all sampling and monitoring results accumulated over the preceding year.
Operation of Electrified GO Trains	N/A	Air Quality	• Reduction in local air contaminant • Reduction in regional contaminant and greenhouse gas emissions	• None required as the potential effect is beneficial	• None required as the potential effect is beneficial
USRC Hydro One Conflicts	• Construction of an underground utility corridor • Construction of utility bridges Construction of the new and expanded Don Fleet JCT	Air Quality	• Construction related air pollution may pose risks to human health and wellbeing	• Prior to commencement of construction, develop and implement a detailed Construction Air Quality Management Plan (AQMP). The AQMP will: o Demonstrate compliance with the specific air quality criteria and limits in the Metrolinx Environmental Guide for Air Quality and Greenhouse Gas Emissions Assessment (2019). o Define the Project's air quality impact zone and identify all sensitive receptors within this area. o Assess the baseline air quality by continuous measurement of local ambient concentrations of PM2.5 and PM10 over a minimum period of one week, where large local sources of pollution, such as highways, directly affect the zone of influence of the Project. o Estimate and document the predictable worst-case air quality impacts of the Project on sensitive receptors within the air quality impact zone, develop appropriate mitigation measures, demonstrate their effectiveness, and commit to their timely implementation. o Monitor continuously any contaminant, in addition to PM2.5 and PM10, which is predicted to exceed its relevant air quality exposure criterion during any phase of the Project and at any receptor. o Include explicit commitment to the implementation of all applicable best practices identified in the Environment Canada document, Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities (2005). • Develop a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction. • Metrolinx will monitor the construction staging/laydown areas to ensure nuisance effects (i.e., noise and dust) are minimized to the extent possible.	• Develop and implement Weekly Air Quality Monitoring Plans that document how air quality monitoring has been conducted and compliance assessed to effectively prevent unacceptable rates of air emissions in accordance with the following guidelines: o The construction related air contaminants of primary concern are in the form of particulate matter, with the principal construction related fractions of $PM_{2.5}$ and PM_{10} - particulate matter of less than 2.5 and 10 micron in diameter, respectively. Other contaminants of concern include crystalline silica and oxides of nitrogen. The list of contaminants will be expanded with any and all air pollutants that may be produced as a result of the work. o The criteria for PM2.5, PM10 and crystalline silica are provided in Metrolinx's *Environmental Guide for Air Quality and Greenhouse Gas Emissions Assessment* (2019). The applicable criteria for all other air contaminants of concern are to be found in the various schedules of *Ontario Regulation 419/05*. • Siting of the monitors should generally follow the guidelines provided in the Ministry of the Environment, Conservation and Parks (MECP) *Operations Manual for Air Quality Monitoring in Ontario* (2018).

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TABLE 4-130: SUMMARY OF NOISE AND VIBRATION MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
Increased Train Service	• Operation of increased train service under the GO Expansion Program	Operational Noise (Trains)	Environmental noise may cause annoyance, disturb sleep and other activities, and affect human health. If operations are projected to cause a 5-dB increase or greater in the average energy equivalent noise (referred to as "Leq") relative to the existing noise level or the MECP objective of 55 dBA for daytime and 50 dBA for night-time, whichever is higher, then mitigation is required.	<u>Mitigation per TPAP Study Report (Noise Barriers):</u> • Deploy the noise barriers defined in the *Noise and Vibration Study Reports GO Rail Network Electrification Project, 2020* (RWDI). • Maintain noise barriers so as to ensure their continued effectiveness in noise reduction. • If deviating from the assessments made in the *Noise and Vibration Study Reports GO Rail Network Electrification Project, 2020* (RWDI), comply with the noise impact and assessment criteria in the Metrolinx *Guide for Noise and Vibration Assessment* (2020). <u>Mitigation at the Source:</u> • Deploy vehicle and track technology and related maintenance measures to maintain compliance with the noise and vibration exposure criteria defined below. <u>Mitigation Criteria:</u> • Meet the following long-term day-time/ night-time maximum noise exposure objectives at all noise sensitive receptors across the system, where background noise levels allow their realization: o 10-year objective: 70/60 dBA o 20-year objective: 60/50 dBA o 25-year objective: 55/50 dBA • Meet the airborne noise exposure criteria in the MOEE/GO *Protocol for Noise and Vibration Assessment* (1995). • Meet the ground-borne (vibration induced) noise exposure criteria in the MOEE/GO *Protocol for Noise and Vibration Assessment* (1995). • Meet any additional future criteria or guidance developed by regulatory agencies, as applicable. <u>Additional Commitments:</u> • Noise impacts due to switch heaters on the rail network (USRC, LSW, LSE, BR & SV corridors) will be re-visited during the detail design stage where more details will be available to allow more refined analysis of the switch heaters noise impacts. Metrolinx will investigate the feasibility of noise control measures when levels exceed 45 dBA in urban areas and 40 dBA in rural areas. o Metrolinx will ensure that the reference noise level of natural gas and electricity powered switch heaters are correctly and accurately measured. Metrolinx will also ensure that the assessment is based for a predictable worst-case scenario of switch heater operation. The assessment will use the applicable noise exposure criteria in the MECP document, NPC-300. • During detailed design Metrolinx will undertake measurements at regular intervals to confirm the noise levels at crossovers and switches at a representative location on the GO rail network. o Metrolinx will carry out measurement of noise and vibration at 100, 200 and 300 m plus one additional measurement beyond 300 m (in each direction) from representative switches/crossovers and GO Transit trains. This will provide a more extensive data base for future assessments. The assessment criteria for these devices are those of the MOEE/GO *Protocol for Noise and Vibration Assessment* (1995).	• Measure and document the Leq (16-hour) and Leq (8-hour) noise levels, under predictable worst-case conditions, at locations where new noise mitigation barriers have been provided per the 2020 noise and vibration studies and per the Metrolinx Enhanced Mitigation Program. Outdoor measurements will be carried out in accordance with MECP requirements and US FTA Report No. 0123, *Transit Noise and Vibration Impact Assessment Manual* (2018). The primary purpose of these measurements is to ascertain the effectiveness of the implemented mitigation measure(s). • Assess the condition and performance of locomotives, coaches, DMUs and EMUs with respect to noise emissions as part of maintenance to ensure continued compliance with manufacturer specifications • Assess the condition and performance of the rail tracks and switches with respect to noise as part of maintenance to ensure continued compliance with manufacturer specifications
		Operational Vibration (Trains)	Vibration can cause annoyance, interfere with human activity and affect human health. It may also cause building damage. A change in vibration levels may occur where there are changes in track alignment, addition of new	<u>Mitigation per TPAP Study Report</u>: • Deploy mitigation recommended in the *GO Expansion Noise and Vibration Study Report* (RWDI). Review and update the vibration assessment during the design of new infrastructure at representative receptor locations to ensure compliance with the vibration exposure criteria in the MOEE/GO *Protocol for Noise and Vibration Assessment* (1995).	• Measure and document the vibration impacts, under predictable worst-case conditions, of each distinct type of GO Transit train consist operating in the corridor of interest at locations where the 2020 noise and vibration studies recommends mitigation of vibration impacts. Measurements will be carried out at or near representative vibration sensitive receptors

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
			track, and changes to or addition of special track work. Vibration levels may also change with changes in rail vehicle specifications and operating conditions.	Mitigation at the Source: • Deploy vehicle and track technology and related maintenance measures to maintain compliance with the noise and vibration exposure criteria defined below. Mitigation Criteria: • Meet the ground-borne vibration criteria in the MOEE/GO *Protocol for Noise and Vibration Assessment* (1995).	in accordance with MECP requirements and US FTA Report No. 0123, *Transit Noise and Vibration Impact Assessment Manual* (2018). The primary purpose of these measurements is to ascertain the effectiveness of the implemented mitigation measure(s). • Assess the condition and performance of locomotives, coaches, DMUs and EMUs with respect to vibration levels as part of maintenance to ensure continued compliance with manufacturer specifications • Assess the condition and performance of the rail tracks and switches with respect to vibration levels as part of maintenance to ensure continued compliance with manufacturer specifications
Construction activities including the preparation and installation of OCS support foundation structure and the OCS wiring	• Site preparation and construction of the infrastructure • Auguring of holes or excavation with an excavator • Install OCS foundations at an approximate depth of 5m • Erect poles • Install wiring via work truck along corridors • Tree removals	Construction and Maintenance-related Noise	Environmental noise may cause annoyance, disturb sleep and other activities, and affect human health. The severity of the noise effects resulting from construction projects varies, depending on: • Scale, location and complexity of the project • Construction methods, processes and equipment deployed • Total duration of construction near sensitive noise receptors • Construction activity periods (days, hours, time period) • Number and proximity of noise-sensitive sites to construction area(s)	• Prior to commencement of construction, develop and submit a detailed Construction Noise Management Plan. • The Construction Noise Management Plan shall: o Document and commit to all measures to be taken for meeting the noise exposure limits documented in the Metrolinx *Guide for Noise and Vibration Assessment* (2020) at every directly exposed sensitive receptor and throughout the entire project. o Determine the Zone of Influence for construction related noise based on the noise exposure limits outlined in the Metrolinx *Guide for Noise and Vibration Assessment* (2020) and taking into consideration the construction site, staging and laydown sites and hauling routes, each stage of the construction (including demolition), the overall construction schedule along with the schedule of each major component and associated major construction processes and equipment usage. o Identify all sensitive receptors that fall within the Zone of Influence for construction related noise. Mitigation measures will be proposed for these sensitive receptors, and the effects of the proposed mitigation measures will then be evaluated using noise modelling. If results of the modelling indicate that any sensitive receptors still remain within the Zone of Influence for construction related noise, then the following shall apply: ▪ Additional mitigation is proposed and subsequently modelled until the sensitive receptor does not fall within the Zone of Influence; or ▪ If mitigation strategies are not viable, receptor based mitigation will be proposed. • The Construction Noise Management Plan will include the temporary/permanent noise barriers indicated in the applicable noise and vibration construction impact assessment report (2020). Where additional work sites are identified which were not assessed as part of the applicable noise and vibration construction impact assessment report (2020), or where construction activities at any given site differ from those considered in this report, conduct modelling to evaluate the need for additional noise barriers as part of the Construction Noise Management Plan.	The Construction Noise Management Plan will incorporate the following requirements related to monitoring of noise and noise related complaints: • Monitor noise where the Construction Noise Management Plan indicates that noise exposure limits may be exceeded. At these locations, monitor noise continuously at each geographically distinct, active construction site with one monitor located strategically to capture the highest exposure level based on planned construction activities and the number, geographic distribution and proximity of noise sensitive receptors. Develop weekly reports describing the monitoring conducted and summarizing the data collected for the reporting period. The reports will include but not be limited to the number and duration of any incident during which any of the noise exposure limits documented in the Metrolinx *Guide for Noise and Vibration Assessment* (2020) were exceeded, the probable cause of each exceedance, the incident-specific measure(s) implemented, the resulting mitigated noise levels and the complaints investigation procedure. • Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.
		Construction and Maintenance-related Vibration	• Exposure to vibration may result in public annoyance and complaints. Vibration may also cause damage to buildings and other structures.	• Adhere to the following vibration exposure limits: o Vibration, as a human irritant, is assessed in terms of its average level. Vibration velocity should not exceed 0.14 mm/s or current conditions (whichever is higher) by more than 25%. o As a threat to buildings, vibration is assessed in terms of its peak value. The Zone Of Influence for vibration shall be the area where structures are expected to experience vibration peak particle velocities that exceed 5 mm/s. Vibration velocity should be limited to 8-22 mm/s, depending on vibration frequency. These limits are prescribed by the most current versions of the *Toronto Municipal Code Chapter 591, Noise* (2020) and *Chapter 363, Vibration* (2019) for typical structures (not building with special needs). • Adhere to the ground-borne (vibration induced) noise exposure criteria in the US FTA Report No. 0123, *Transit Noise and Vibration Impact Assessment Manual* (2018). • Develop and implement a detailed Construction Vibration Management Plan for Metrolinx review and approval with minimum requirements outlined below:	The Construction Vibration Management Plan will incorporate the following requirements related to monitoring of vibration and vibration related complaints: • Monitor vibration continuously at structures where the Construction Vibration Management Plan indicates that structures are deemed to be within the Zone Of Influence for construction related vibration or at additional structures as requested by Metrolinx. • The type of Vibration Monitoring Program that is established is based on the vibration Zone Of Influence, the project location, duration,

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
				○ Complete a detailed construction related vibration assessment prior to the commencement of construction that includes assessment of the vibration Zone Of Influence. The Zone Of Influence for vibration shall be established by using the methodology and input data provided in Section 7.2 of the US FTA Report No. 0123 (2018), *Transit Noise and Vibration Impact Assessment Manual* (2018). ○ Complete pre-construction condition surveys for properties within the vibration Zone Of Influence of the planned work to establish their condition and establish a baseline prior to any work beginning. ○ Identify any heritage structures and other sensitive structures, buildings or infrastructure vulnerable to vibration damage, assess requirements and, if necessary, develop mitigation measures. ○ Identify buildings, where vibration sensitive activities such as sound recording or medical image processing take place, assess requirements and, if necessary, develop mitigation measures. ○ Establish a 15-metre setback distance between the construction vibration source and nearby buildings, where possible, to minimize impacts. If this is not possible, then monitor the vibration levels associated with the activity. ○ Select construction/maintenance methods and equipment with the least vibration impacts. ○ In the presence of persistent complaints and subject to the results of a field investigation, identify alternative vibration control measures, where reasonably available.	presence of night-time activity, and receptor proximity. The monitoring types include: ○ Type 1: Monitoring continuously throughout the project (for receptors within the Zone Of Influence). ○ Type 2: Monitoring during most impactful phases of the project only (for receptors outside of the Zone Of Influence but within 50 m of the boundary of the construction site). ○ Type 3: Monitoring in response to complaints only (for receptors outside of the Zone Of Influence and beyond 50 m of the boundary of the construction site). • Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.
USRC Hydro One Conflicts	• Relocation of circuits to an underground utility corridor, utilizing utility bridges: ○ Install surface troughs ○ Install cable banks ○ Install utility bridges • New Don Fleet Junction: ○ Remove Hydro Tower #10A ○ Excavate soil ○ Install BPEX foundations ○ Erect BPEX structures ○ Install wiring ○ Tree removals ○ Install Durisol© walls	Construction Noise	Environmental noise may cause annoyance, disturb sleep and other activities, and affect human health. The severity of the noise effects resulting from construction projects varies, depending on: • Scale, location and complexity of the project • Construction methods, processes and equipment deployed • Total duration of construction near sensitive noise receptors • Construction activity periods (days, hours, time period) • Number and proximity of noise-sensitive sites to construction area(s)	• Prior to commencement of construction, develop and submit a detailed Construction Noise Management Plan. • The Construction Noise Management Plan shall: ○ Document and commit to all measures to be taken for meeting the noise exposure limits documented in the Metrolinx Guide for Noise and Vibration Assessment (2020) at every directly exposed sensitive receptor and throughout the entire project. ○ Determine the Zone of Influence for construction related noise based on the noise exposure limits outlined in the Metrolinx Guide for Noise and Vibration Assessment (2020) and taking into consideration the construction site, staging and laydown sites and hauling routes, each stage of the construction (including demolition), the overall construction schedule along with the schedule of each major component and associated major construction processes and equipment usage. ○ Identify all sensitive receptors that fall within the Zone of Influence for construction related noise. Mitigation measures will be proposed for these sensitive receptors, and the effects of the proposed mitigation measures will then be evaluated using noise modelling. If results of the modelling indicate that any sensitive receptors still remain within the Zone of Influence for construction related noise, then the following shall apply: ▪ Additional mitigation is proposed and subsequently modelled until the sensitive receptor does not fall within the Zone of Influence; or ▪ If mitigation strategies are not viable, receptor based mitigation will be proposed. • The Construction Noise Management Plan will include the temporary/permanent noise barriers indicated in the applicable noise and vibration construction impact assessment report (2020). Where additional work sites are identified which were not assessed as part of the applicable noise and vibration construction impact assessment report (2020), or where construction activities at any given site differ from those considered in this report, conduct modelling to evaluate the need for additional noise barriers as part of the Construction Noise Management Plan.	The Construction Noise Management Plan will incorporate the following requirements related to monitoring of noise and noise related complaints: • Monitor noise where the Construction Noise Management Plan indicates that noise exposure limits may be exceeded. At these locations, monitor noise continuously at each geographically distinct, active construction site with one monitor located strategically to capture the highest exposure level based on planned construction activities and the number, geographic distribution and proximity of noise sensitive receptors. Develop weekly reports describing the monitoring conducted and summarizing the data collected for the reporting period. The reports will include but not be limited to the number and duration of any incident during which any of the noise exposure limits documented in the Metrolinx Guide for Noise and Vibration Assessment (2020) were exceeded, the probable cause of each exceedance, the incident-specific measure(s) implemented, the resulting mitigated noise levels and the complaints investigation procedure. • Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
	• Expanded Don Fleet Junction: o Install wiring o Tree removals o Install Durisol© walls	Construction Vibration	• Exposure to vibration may result in public annoyance and complaints. Vibration may also cause damage to buildings and other structures.	• Adhere to the following vibration exposure limits: o Vibration, as a human irritant, is assessed in terms of its average level. Vibration velocity should not exceed 0.14 mm/s or current conditions (whichever is higher) by more than 25%. o As a threat to buildings, vibration is assessed in terms of its peak value. The Zone Of Influence for vibration shall be the area where structures are expected to experience vibration peak particle velocities that exceed 5 mm/s. Vibration velocity should be limited to 8-22 mm/s, depending on vibration frequency. These limits are prescribed by the most current versions of the Toronto Municipal Code Chapter 591, Noise (2020) and Chapter 363, Vibration (2019) for typical structures (not building with special needs). • Adhere to the ground-borne (vibration induced) noise exposure criteria in the US FTA Report No. 0123, Transit Noise and Vibration Impact Assessment Manual (2018). • Develop and implement a detailed Construction Vibration Management Plan for Metrolinx review and approval with minimum requirements outlined below: o Complete a detailed construction related vibration assessment prior to the commencement of construction that includes assessment of the vibration Zone Of Influence. The Zone Of Influence for vibration shall be established by using the methodology and input data provided in Section 7.2 of the US FTA Report No. 0123 (2018), Transit Noise and Vibration Impact Assessment Manual (2018). o Complete pre-construction condition surveys for properties within the vibration Zone Of Influence of the planned work to establish their condition and establish a baseline prior to any work beginning. o Identify any heritage structures and other sensitive structures, buildings or infrastructure vulnerable to vibration damage, assess requirements and, if necessary, develop mitigation measures. o Identify buildings, where vibration sensitive activities such as sound recording or medical image processing take place, assess requirements and, if necessary, develop mitigation measures. o Establish a 15-metre setback distance between the construction vibration source and nearby buildings, where possible, to minimize impacts. If this is not possible, then monitor the vibration levels associated with the activity. o Select construction/maintenance methods and equipment with the least vibration impacts. • In the presence of persistent complaints and subject to the results of a field investigation, identify alternative vibration control measures, where reasonably available.	The Construction Vibration Management Plan will incorporate the following requirements related to monitoring of vibration and vibration related complaints: • Monitor vibration continuously at structures where the Construction Vibration Management Plan indicates that structures are deemed to be within the Zone Of Influence for construction related vibration or at additional structures as requested by Metrolinx. • The type of Vibration Monitoring Program that is established is based on the vibration Zone Of Influence, the project location, duration, presence of night-time activity, and receptor proximity. The monitoring types include: o Type 1: Monitoring continuously throughout the project (for receptors within the Zone Of Influence). o Type 2: Monitoring during most impactful phases of the project only (for receptors outside of the Zone Of Influence but within 50 m of the boundary of the construction site). o Type 3: Monitoring in response to complaints only (for receptors outside of the Zone Of Influence and beyond 50 m of the boundary of the construction site). • Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.

***NOTES:**
Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time.
If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies

TABLE 4-131: SUMMARY OF VISUAL/AESTHETICS MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
All Project Components	• Footprint Impacts • Construction • Operations & Maintenance	Visual	• Visual impacts affecting existing viewsheds and visual receptors	• Develop and implement an Environmental Management System (EMS) to ensure the environmental protection/mitigation measures identified as part of the GO Rail Network Electrification TPAP are fulfilled and functioning as expected. The overall intent of the EMS will be to integrate environmental management into the daily operations and other quality management systems of the project. • As part of detailed design, efforts will be made to minimize visual impacts where possible/feasible • Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts. • A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas. • Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary. • Municipal by-laws and Ministry of Transportation (MTO) practices for lighting in areas near or adjacent to highways and roadways regarding outdoor lighting and incorporates industry best practices provided in ANSI/IES RP-8-18. • The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses. • Placement of infrastructure in relation to supporting infrastructure such as viaducts (e.g., place OCS poles in alignment with bridge piers if possible). • Offsetting tree removals where feasible as per Metrolinx's *Vegetation Guideline* (2020) in affected areas and in parks; which may offset/minimize visual impacts due to tree removal.	• Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction work zones. • Measure illuminance levels using an illuminance metre in accordance with ANSI/IES RP-8-18 Chapter 4. • Monitor effectiveness of light pollution mitigation measures. • Construction management to enforce adherence to requirements in contract. • Periodic inspection and maintenance such as repainting degraded finishes if required. • Monitor installation of compensation plantings to ensure they are installed properly.
OCS	• Operation of OCS • Tree pruning • Maintenance		• Vegetation removals • Damage to adjacent to the removal areas • Minimal temporary visual impacts due to exposure of infrastructure	• Adherence to relevant guidelines and OPSS for clearing and grubbing (OPSS 201), site preparation and tree protection (OPSS 801). • Offsetting tree removals where feasible as per Metrolinx's *Vegetation Guideline* (2020) in affected areas and in parks; which may offset/minimize visual impacts due to tree removal.	• Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction work zones. • Monitor installation of compensation plantings to ensure they are installed properly. • Monitoring and management of trees/vegetation within the rail corridor right-of-way will be undertaken in accordance with the Integrated Vegetation Management (IVM) program within the Metrolinx *Vegetation Guideline* (2020).
	• Excavate soil • Install OCS foundations at an approximate depth of 5m • Erect poles • Install wiring • Tree removals		• Vegetation removals • Damage to trees adjacent to the removal areas • Viewshed impacts due to heavy construction equipment and extraneous light from night-time construction	• Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts. • A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas. • Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary. • The Constructor will develop for Metrolinx review and approval an outdoor construction Light Pollution Plan that complies with all local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting in areas near or adjacent to highways and roadways regarding outdoor lighting and incorporates industry best practices provided in ANSI/IES RP-8-18. • The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.	• Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction work zones. • Measure illuminance levels using an illuminance in accordance with ANSI/IES RP-8-18 Chapter 4. • Monitor effectiveness of light pollution mitigation measures. • Monitor installation of compensation plantings to ensure they are installed properly.
Walkers Line Layover – Lakeshore West Corridor	• OCS Footprint impacts		• Visual impacts affecting existing viewsheds from natural areas nearby	• As part of detailed design, efforts will be made to minimize visual impacts where possible. • A Design Excellence process will be followed to integrate the new infrastructure design into the existing environment, where feasible, to reduce the extent of visual impacts.	• Construction management to enforce adherence to requirements in contract.

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
Unionville Storage Yard – Stouffville Corridor	• OCS Footprint impacts		• Visual impacts affecting existing viewsheds from secondary school and recreational areas nearby	• As part of detailed design, efforts will be made to minimize visual impacts where possible. • A Design Excellence process will be followed to integrate the new infrastructure design into the existing environment, where feasible, to reduce the extent of visual impacts.	• Construction management to enforce adherence to requirements in contract.
Midland Layover – Lakeshore East Corridor	• OCS Footprint impacts		• Viewshed impacts due to heavy construction equipment and extraneous light from night-time construction	• As part of detailed design, efforts will be made to minimize visual impacts where possible. • A Design Excellence process will be followed to integrate the new infrastructure design into the existing environment, where feasible, to reduce the extent of visual impacts.	• Construction management to enforce adherence to requirements in contract.
Construction of Layover Facilities	• OCS Construction Activities		• Viewshed impacts due to heavy construction equipment and extraneous light from night-time construction	• Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts. • A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas. • Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary. • Municipal by-laws and Ministry of Transportation (MTO) practices for lighting in areas near or adjacent to highways and roadways regarding outdoor lighting and incorporates industry best practices provided in ANSI/IES RP-8-18. • The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.	• Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction work zones. • Measure illuminance levels using an illuminance metre in accordance with ANSI/IES RP-8-18 Chapter 4. • Monitor effectiveness of light pollution mitigation measures.
USRC Hydro One Conflicts	• Relocation of circuits to an underground utility corridor, utilizing utility bridges: o Install surface troughs o Install cable banks o Install utility bridges • New Don Fleet Junction: o Remove Hydro		• Visual impacts affecting existing viewsheds and visual receptors along Lower Sherbourne Street, Parliament Street and Cherry Street, in the vicinity of the proposed utility bridges (south side) • Visual impacts affecting existing viewsheds and visual receptors, specifically along the Lower Don Trail in the vicinity of the new and existing/expanded Don Fleet Junction	• Mitigation measures related to potential visual impacts of the utility bridges are outlined in the Cultural Heritage commitment tables. • As part of detailed design, efforts will be made to minimize visual impacts as much as possible. • A Design Excellence process will be followed to integrate the new infrastructure into the existing environment to reduce the extent of visual impacts. This will include screened enclosures, such as fencing and Durisol© walls. • Anti-graffiti coating will be applied on public-facing Durisol© walls. • With respect to Durisol© walls, mitigation recommendations include the use of concrete patterning/windows where walls are adjacent to sensitive receptors, and consideration for grading design to minimize wall heights and maximize planting of trees and shrubs, where applicable. Discussions with the City of Toronto are ongoing to determine design solutions and/or additional mitigation measures as it relates to the potential for graffiti on the Durisol© walls. • In order to maintain sightlines along the Lower Don Trail, clear Durisol© wall panels are proposed on the north-west corner of the existing Don Fleet Junction. • Construction schedule delays will be avoided to the extent possible in order to minimize the duration of construction and corresponding visual impacts. • A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas. • Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary. • Municipal by-laws and Ministry of Transportation (MTO) practices for lighting will be followed and incorporate industry best practices provided in ANSI/IES RP-8-18.	• Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified construction work zones. • Measure illuminance levels using an illuminance meter in accordance with ANSI/IES RP-8-18 Chapter 4. • Monitor effectiveness of light pollution mitigation measures. • Construction management to enforce adherence to requirements in contract. • Periodic inspection and maintenance such as repainting degraded finishes if required.

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
	Tower #10A o Excavate soil o Install BPEX foundations o Erect BPEX structures o Install wiring o Tree removals o Install Durisol© walls • Expanded Don Fleet Junction: o Install wiring o Tree removals o Install Durisol© walls			• The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses. • Offsetting tree removals where feasible, as per Metrolinx's Vegetation Management Protocol (January 2020) in affected areas and in parks; which may offset/minimize visual impacts.	

***NOTES:**
Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time.

TABLE 4-132: SUMMARY OF UTILITIES MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
OCS/ Underground Transmission Corridor	• Footprint impacts/utility conflicts	Utilities Planning and Construction	• Utility serviceability effects due to design requirement sand construction • Footprint impacts/utility conflicts • Spatial conflict • Electrical clearance conflict • Electrical zones of influence conflict	• Where feasible, all work shall follow applicable standards / policies provided by the public and private utility providers. • Develop and implement a detailed Utility Infrastructure Relocation Plan that identifies all existing utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. The Utility Infrastructure Relocation Plan will be developed in accordance with the project agreement. • Include a written workplan and schedule that addresses the work required to the existing utilities in the area of the works, including a list of all utility relocation construction dependencies, the sequencing of the relocations and the duration of the utility relocations. Schedule to identify potential enabling works. • Perform all work identified in the Utility Infrastructure Relocation Plan to protect, support, safeguard, remove and relocate all Utility Infrastructure. • Obtain permits and consents from and with all Utility Companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and or commissioning of Utility Infrastructure. • Ensure minimizing impact to the Train Service Plans and to continuity of service and disruption to property owners and customers of the Utility Companies to the satisfaction of the Utility Companies and Metrolinx. • Additional surveys will be performed to field locate and verify the existing utilities within the project area and document their condition. • Undertake pre-submission consultation with the relevant regulatory authorities to develop an early approach to securing the permits and approvals for utility infrastructure works to ensure they proceed in a timely manner to support the design and construction schedule. • In the event unexpected utility conflicts are encountered during construction, these will be documented and communicated immediately to Metrolinx and all relevant stakeholders. A field conflict resolution process will be implemented to mitigate the conflict and will include input from all relevant stakeholders. Metrolinx will be notified at the first indication of a delay to their relocation schedule due to the unknown conflict. Metrolinx will review the impact of the delay on the overall utility relocation plan. • In the event of damage resulting in service interruptions, the damage will be reported immediately to Metrolinx and Utility Owner representatives, and all work adjacent to the damaged utility will stop to prevent further damage. • Electrical zone of influence effects may be mitigated through grounding and bonding or isolation	• Maintain regular communication and coordination through issuance of regular progress reports and updates to applicable utility agencies. • Record all installation tolerances and how they are to be monitored. • Perform inspection and testing to ensure successful utility relocation and safe and efficient installation. • A post- construction CCTV inspection of the new utility infrastructure may be required upon completion of the construction works to document condition. • In the event of potential impacts to critical utilities, instrumentation and monitoring will be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities. • Amend crossing agreements • Develop and implement detailed mitigation plan • Continue to meet with the utility companies to determine risks, timing and appropriate mitigation strategy to address potential conflicts • Confirm utility relocations/protection required based on GO Rail Network Electrification Detailed Design and undertake negotiations with relevant utility companies, as required. • Based on the requirements of each utility company, utilities will be relocated or protected to allow for the electrification construction works and allow trains to pass without damage; • With input from legal counsel for both contracting parties, amend existing crossing agreements or develop new crossing agreements that set out the additional cost burdens associated with de-energizing and limited operational windows as well as fines related to cable fall. • Develop a mitigation plan with each utility that includes the appropriate contractual Option (1, 2 or 3) to implement the appropriate mitigation strategy (see Utilities Impact Assessment Report included as Appendix I to this EPR). • Implement the mitigation plan through the applicable contractual parties from design through to construction.
Operation/ Maintenance of OCS	• Operation of OCS • Tree pruning/ maintenance	Utilities Post-Construction Phase	• Future Utility Maintainability • Spatial conflict • Electrical clearance conflict • Electrical zone of influence conflict • Cable fall • De-energizing costs • Limited operational windows for access	• Implementation of Corridor Crossing Agreements to define future access and maintenance scopes. Update Corridor Crossing Agreements as required. • When new utility crossings are proposed, application for a new utility crossing agreement will be required. Where modifications to an existing utility crossing takes place updates to an existing utility crossing will be needed. • Post-construction inspections of the new utility infrastructure shall be undertaken for applicable works upon completion of the construction works to document condition. • Obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards CSA S250-11 – *Mapping of Underground Utility Infrastructure (2011)*, as amended from time to time. • Electrical zone of influence effects may be mitigated through grounding and bonding or isolation.	• Develop and implement tracking system for as-built deliverables. • Amend crossing agreements • Develop and implement detailed mitigation plan

***NOTES:**
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If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies.

TABLE 4-133: SUMMARY OF ELECTROMAGNETIC INTERFERENCE/ELECTROMAGNETIC FIELDS MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
Design and Development Strategy for Electromagnetic Compatibility (EMC); Prepare and Implement an EMI/EMC Control Plan	N/A	Electromagnetic Interference/ Electromagnetic Fields	• Effects related to Extremely Low Frequency (ELF) and Electromagnetic Fields (EMF) • EMI/EMF/EMC effects due to operation of electrified infrastructure	• The Constructor will prepare, submit and implement an EMI/EMC Control Plan, in accordance with the requirements of the European Committee for Electrotechnical Standardization (CENELEC) Standard EN 50121 and the Project Agreement, to communicate the design and development strategy for addressing and identifying the interference risk areas and developing solutions to mitigate the risk of the EMIs/EMCs of the project system elements in the operating environment, and to catalogue the types of electrics and electronics that will be installed. The EMI/EMC Control Plan will include a frequency management plan to capture the operating frequencies at the system engineering level from all intentional emitters in the vicinity of the railway. • The Constructor will conduct an EMI site survey to identify existing sensitive receptors and emitters throughout Metrolinx Territory within six (6) months following Financial Close as well as at least ninety (90) days prior to the completion of System commissioning and submit each EMI site survey report in accordance with the Project Agreement. • The Constructor will engage affected stakeholders to ensure that mutual EMI/EMC concerns are appropriately addressed and mitigated. • In case of Third Party Infrastructure owned and operated by CN, CP, VIA and TTC, the Constructor will carry out an impact analysis to be consulted with the infrastructure owner for consensus, carry out the design to mitigate the mutually agreed impacts to the third party by use of designers approved by the impacted party, and issue the proposed designs to the Metrolinx for implementation. • The Constructor will cooperate with Third Party Stakeholders in the investigation and resolution of complaints regarding documented or suspected EMI/EMC issues. The Constructor will implement EMI/EMC mitigation to the satisfaction of the Third Party stakeholders. • Mitigation measures and commitments during design, construction and operations will be conducted in accordance with the Project Agreement. • A frequency management plan will be developed and implemented by the constructor, to capture the operating frequencies at the system engineering level from all intentional emitters in the vicinity of the railway. • Coordinate with Industry Canada throughout the Project Term to ensure that EMC requirements are addressed and that the necessary licenses and approvals are acquired and maintained. • For both Extremely Low Frequency (ELF) Electromagnetic Fields (EMF) and Electromagnetic Interference (EMI), industry-standard mitigation measures will be applied • As per the American Public Transportation Association (APTA) Standard SS-E-010-98, the EMC Control Plan should include but not be limited to: o Characterizes potential EMI sources and hazards to transit/rail operations; o Considers low-cost, no-cost options, or best practices for EMI prevention, control and mitigation techniques. Examples are: posted warning signs to control access, fencing, and shielding of substations, or grade crossing access, as needed); o Considers best practices in EMI susceptibility control procedures. Examples are: active or passive shielding, cathodic protection, surge protection, fail-safe circuit redesign, changed location of antennas or susceptible equipment, redesign of equipment, enclosures for equipment, etc.); o Utilizes current EMC guidance and resources for transit electrification developed by EPRI, AAR and AREMA as discussed in Sec. V B EMF Modelling and Measurement Tools.;	• The Constructor shall not install any product, system, subsystem or component until it has successfully passed EMI/EMC qualification testing. The Constructor shall submit evidence of the qualification testing. Monitoring and testing, and submission requirements will be carried out in accordance with the Project Agreement • Demonstrate compliance through field measurements and testing under actual operating conditions, as well as remediation measures if allowable thresholds are exceeded.

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
				○ Includes (or references) a safety analysis and failure analysis of the transit system; ○ Addresses grounding or shorting hazards, prevents, controls or mitigates as needed stray currents (earth-return currents or induced currents in metallic structures and pipelines or along the return rails (where some fraction of the current finds its way back to substation or generating station through the earth for various regions and soil conditions), and the effects of different design and construction practices on these currents; (This list of frequencies is a key input to the detailed, post-electrification EMI scans taken at each TPF and compared to required levels in EN 50121.) ○ Characterizes the frequency bands, spectral characteristics of ELF/EMF and RF generated noise by the pantograph-catenary contact under operating conditions; ○ Characterizes along the right-of-way parameters (e.g., frequency spectrum, electric and magnetic field strengths, modulation system) for the wireless communications, control, and power and propulsion system (including auxiliary power for HVAC, emergency lighting and signage, public address, etc.) • A frequency management plan will be developed and implemented by Metrolinx during the Detailed Design phase. This plan is needed to capture the operating frequencies at the system engineering level from all intentional radiators in the vicinity of the railway. • Metrolinx will continue to coordinate and consult with CN, CP, and VIA as appropriate during detailed design where there are interfaces with freight/VIA territory. The following commitments will be adhered to post TPAP: • Track Circuits & Grade Crossings will need to be immunized (this will be included in the provisions of the EMC Control Plan to be developed during detailed design). ○ Where track is adjacent to Metrolinx electrification ▪ Within Overhead Contact Line Zone (OCLZ). ▪ Possibly beyond the OCLZ for induced effects (range will be confirmed during detailed design). ○ Where electrified track crosses over (considered within OCLZ) ○ Where electrified track abuts non-electrified track ○ Electrified track to third party owned interface locations. ▪ Electrified track to third party unsignalled track (e.g. yards) requires TPS return. • Immunization includes compatible track circuits, impedance bonds as well as bonding & grounding for TPS currents (this will be included in the provisions of the EMC Control Plan to be developed during detailed design).	
NAVCanada and Greater Toronto Airports Authority (GTAA) Requirements			• EMI/EMF/EMC effects due to operation of electrified infrastructure	• The Constructor will evaluate existing baseline EMI/EMC measurements taken for both the UP Express and Electrification projects and supplement them as needed to satisfy the requirements set forth by the GTAA and NAV Canada. • The following commitments will be adhered to during detailed design related to satisfying NAVCanada requirements: ○ Consultation with Nav Canada and GTAA will continue as part of detailed design phase to ensure that any required agreements, approvals or authorizations are obtained prior to project implementation. ○ The contract documents will contain relevant requirements relating to the design of the Metrolinx electrification system in accordance with applicable legislation, codes, etc. including a requirement to demonstrate compliance through field measurements and testing under	• The Constructor will measure actual EMI/EMC emissions during system testing, under actual operations in all normal and degraded states to verify that emissions meet the requirements indicated in the relevant standards. The Constructor will submit the actual EMI/EMC emissions measurements report as per Project Agreement requirements. • Demonstrate compliance through field measurements and testing

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
				actual operating conditions, as well as remediation measures if allowable thresholds are exceeded. o Further discussions will be held with GTAA and NavCanada to confirm expansion plans and potential areas of interference during Detailed Design. • The following commitments will be adhered to during detailed design related to satisfying Greater Toronto Airports Authority (GTAA) requirements: o As part of detailed design, an agreement will need to be established between Metrolinx and Greater Toronto Airports Authority (GTAA) in relation to how the electrification project will be designed and implemented, and 2) final design will be prepared based on the agreement o The contract document requirements will reflect that that the results of the Electromagnetic Compatibility/Electromagnetic Interference (EMC/EMI) testing shall be provided to the GTAA. o Metrolinx will inform the GTAA of the proposed changes to the areas that are jointly supported with the GTAA's Emergency Services prior to finalizing the design. The denoted areas of interest will be reviewed jointly. This will be reflected in the contract document requirements. • Further discussions will be held with GTAA and NavCanada to confirm expansion plans and potential areas of interference during detailed design.	under actual operating conditions, as well as remediation measures if allowable thresholds are exceeded.
Installation of Overhead Contact System (OCS)	• Excavate soil • Install OCS foundations at an approximate depth of 5m • Erect poles • Install wiring • Tree removals • Excavate the soil to the required depth (approximately 1m) • Backfill/restore road(s), as per design	Electromagnetic Interference/ Electromagnetic Fields	• Worker exposure to ELF EMF	• Develop and implement control measures to ensure separation, limits in circuit lengths and shielding to eliminate the risk of magnetic coupling with existing cables in buried routes.	• N/A
Operation of Overhead Contact System (OCS)	• Operation of OCS • Tree pruning/ maintenance		• Time-Varying EMFs • Induced Current in Neighbouring Metallic Wires, Fences, Pipelines, Cables and Earth (grounding) Networks • Unintended Contact with High-Voltage Source	• Induced Current in Neighbouring Metallic Wires, Fences, Pipelines, Cables and Earth (grounding) Networks – mitigate through design, e.g., grounding and shielding, and, physical separation. • Unintended Contact with High-Voltage Source – mitigate by strict adherence to industry-standard guidelines for handling live voltage sources. • EMI – Mitigated via EMC Control Plan. • Time-Varying EMFs – Mitigated through design, e.g., grounding and shielding, physical separation. • Radiated Magnetic Fields – Mitigated through design, e.g., grounding and shielding. • ELF EMF – Mitigated through design; Verified by before-and-after measurements.	• ELF EMF will be confirmed/re-assessed post-electrification, specifically at locations which exhibited ELF EMF levels above 10 mG post-electrification re-assessment cut-off. • During Detailed Design, further analysis and measurements will be carried once the electric rolling stock specifications are known in order to ensure EMI immunity and emissions compliance for the electrified GO system. • EMI, Time-Varying EMFs, Radiated Magnetic Fields, and ELF EMF should be verified both statically (while vehicle at rest) and dynamically (while vehicle moving under power).

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
					• Prior to project implementation, baseline measurements will be taken statically while vehicle is powered off and while vehicle is under power but not moving, both inside and outside the vehicle, at heights and distances mandated by EN 50121 and EN 50500. • Prior to project implementation, dynamic measurements will be taken at both selected station and/or platform location(s) and at identified EMI-sensitive sites, including Burgess Veterinary Hospital to ensure to ensure EMI levels are within acceptable industry standard ranges • During the electrification commissioning phase, overall ELF and RF emissions emanating from the GO electrified railway system as a whole will be field tested and verified to ensure EMFs are within the limits of applicable industry standards.
Walkers Line Layover – Lakeshore West Corridor	• Installation of OCS; • Install duct banks; • Construct 25kV feeder routes; and, • Tree removals.	Electromagnetic Interference/ Electromagnetic Fields	• Time-Varying EMFs; • Induced Current in Neighbouring Metallic Wires and Fences; • Unintended Contact with High-Voltage Source; and, • ELF EMF.	• Time-Varying EMFs – Mitigated by proper design, e.g., grounding and shielding, physical separation. • Induced Current in Neighbouring Metallic Wires and Fences – Mitigated by proper design, e.g., grounding and shielding, and, physical separation. • Unintended Contact with High-Voltage Source – Mitigated by Strict adherence to industry-standard guidelines for handling live voltage sources. • ELF EMF – Mitigated by proper design; Verified by before-and-after measurements. • Industry-standard completion of this project component is a primary methodology for mitigating the effects of electric and magnetic fields.	• ELF EMF will be measured post-electrification. (All Sites) • Industry-standard practices for handling high-voltage should be followed. (All Sites)
Midland Layover – Lakeshore East Corridor	• Installation of OCS; • Install duct banks; • Construct 25kV feeder routes; and, • Tree removals.	Electromagnetic Interference/ Electromagnetic Fields	• Time-Varying EMFs; • Induced Current in Neighbouring Metallic Wires and Fences; • Unintended Contact with High-Voltage Source; and, • ELF EMF.	• Time-Varying EMFs – Mitigated by proper design, e.g., grounding and shielding, physical separation. • Induced Current in Neighbouring Metallic Wires and Fences – Mitigated by proper design, e.g., grounding and shielding, and, physical separation. • Unintended Contact with High-Voltage Source – Mitigated by Strict adherence to industry-standard guidelines for handling live voltage sources. • ELF EMF – Mitigated by proper design; Verified by before-and-after measurements. • Industry-standard completion of this project component is a primary methodology for mitigating the effects of electric and magnetic fields.	• ELF EMF will be measured post-electrification. (All Sites) • Industry-standard practices for handling high-voltage should be followed. (All Sites)
Unionville Storage Yard-Stouffville Corridor	• Installation of OCS; • Install duct banks; • Construct 25kV feeder routes; and, • Tree removals.	Electromagnetic Interference/ Electromagnetic Fields	• Time-Varying EMFs; • Induced Current in Neighbouring Metallic Wires and Fences; • Unintended Contact with High-Voltage Source; and, • ELF EMF.	• Time-Varying EMFs – Mitigated by proper design, e.g., grounding and shielding, physical separation. • Induced Current in Neighbouring Metallic Wires and Fences – Mitigated by proper design, e.g., grounding and shielding, and, physical separation. • Unintended Contact with High-Voltage Source – Mitigated by Strict adherence to industry-standard guidelines for handling live voltage sources.	• ELF EMF should be measured post-electrification. (All Sites) • Industry-standard practices for handling high-voltage should be followed. (All Sites)

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
				• ELF EMF – Mitigated by proper design; Verified by before-and-after measurements. • Industry-standard completion of this project component is a primary methodology for mitigating the effects of electric and magnetic fields.	
Construction of Layover Facilities	• Installation of OCS; • Install duct banks; • Construct 25kV feeder routes; and, • Tree removals.	Electromagnetic Interference/ Electromagnetic Fields	• Time-Varying EMFs; • Induced Current in Neighbouring Metallic Wires and Fences; • Unintended Contact with High-Voltage Source; and, • ELF EMF.	• Time-Varying EMFs – Mitigated by proper design, e.g., grounding and shielding, physical separation. • Induced Current in Neighbouring Metallic Wires and Fences – Mitigated by proper design, e.g., grounding and shielding, and, physical separation. • Unintended Contact with High-Voltage Source – Mitigated by Strict adherence to industry-standard guidelines for handling live voltage sources. • ELF EMF – Mitigated by proper design; Verified by before-and-after measurements. • Industry-standard completion of this project component is a primary methodology for mitigating the effects of electric and magnetic fields.	• ELF EMF will be measured post-electrification. • Industry-standard practices for handling high-voltage should be followed.
USRC Hydro One Conflicts	• Relocation of overhead circuits to an underground utility corridor, utilizing utility bridges: o Install surface troughs o Install cable banks o Install utility bridges • New Don Fleet Junction: o Remove Hydro Tower #10A o Excavate soil o Install BPEX foundations o Erect BPEX structures o Install wiring o Tree removals o Install Durisol© walls o Grounding/Bonding • Expanded Don Fleet Junction: o Install wiring o Tree removals o Install Durisol© walls o Grounding/Bonding	Electromagnetic Interference/ Electromagnetic Fields	• Time-Varying EMFs; • Induced Current in Neighbouring Metallic Wires and Fences; • Unintended Contact with High-Voltage Source; and, • ELF EMF.	• Time-Varying EMFs – Mitigated by proper design, e.g., grounding and shielding, physical separation. • Induced Current in Neighbouring Metallic Wires and Fences – Mitigated by proper design, e.g., grounding and shielding, and, physical separation. • Unintended Contact with High-Voltage Source – Mitigated by Strict adherence to industry-standard guidelines for handling live voltage sources. • ELF EMF – Mitigated by proper design; Verified by before-and-after measurements. • Industry-standard completion of this project component is a primary methodology for mitigating the effects of electric and magnetic fields.	• ELF EMF will be measured post-electrification. • Industry-standard practices for handling high-voltage should be followed.

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
Installation/Construction of OCS	• N/A	Electromagnetic Interference/ Electromagnetic Fields	• N/A	• N/A	• N/A
Operation of Electric Rolling Stock	• Operation of Electric Rolling Stock	Electromagnetic Interference/ Electromagnetic Fields	• EMI • Time-Varying EMFs • Radiated Magnetic Fields • ELF EMF	• EMI – mitigate via EMC Control Plan. • Time-Varying EMFs – mitigate through design, e.g., grounding and shielding, physical separation. • Radiated Magnetic Fields – mitigate through design, e.g., grounding and shielding.	• During detailed design, further analysis and measurements will be conducted once the electric rolling stock specifications are known in order to ensure EMI immunity and emissions compliance for the electrified GO system. • During the electrification commissioning phase, overall ELF and RF emissions emanating from the GO electrified railway system as a whole will be field tested and verified to ensure EMFs are within the limits of applicable industry standards. • Verify ELF EMF by measurements taken before and after project implementation.

***Notes:**
Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time.
If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies.

TABLE 4-134: SUMMARY OF STORMWATER MANAGEMENT MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
Installation of OCS	• Excavate soil • Install OCS foundations at an approximate depth of 5m • Erect poles • Install wiring • Tree removals	Potential Impacts and Proposed Mitigation Measures for Stormwater and Site Drainage	• Drainage and stormwater management, quantity and drainage patterns are not anticipated to be affected due to installation of OCS infrastructure along the rail corridors based on the preliminary analysis undertaken as part of the conceptual design TPAP work. • The proposed construction activities pose a potential impact due to sediment transport into adjacent natural areas including watercourses, wetlands and municipal drainage infrastructure. • The proposed works may result in increases to impervious areas, with potential effects to water quantity and quality. • In addition to the increases in impervious coverage, there may be alterations to the local drainage system, both overland (major drainage system) and storm sewers (minor drainage system).	• The Constructor will prepare and implement a Drainage and Stormwater Report, an Erosion and Sediment Control Plan, detailed drainage design and erosion and sediment control drawings in accordance with the Ministry of the Environment, Conservation and Parks (MECP) *Stormwater Management Planning and Design Manual* (2003), the Greater Golden Horseshoe's *Erosion and Sediment Control Guideline for Urban Construction* (December, 2006), as amended from time to time, and the guidelines and regulatory requirements of the Conservation Authority having jurisdiction. • The overall stormwater quality and quantity control strategy will be developed in accordance with all relevant municipal, provincial and federal requirements, as amended, as well as the requirements of Conservation Authorities having jurisdiction. • A detailed assessment of proposed ditches along the rail corridor is required to ensure adequate drainage conveyance in accordance with municipal requirements and American Railway Engineering and Maintenance-of-Way Association (AREMA) *Manual for Railway Engineering* (2019). • Infiltration requirements for municipalities will be determined as per the design guidelines and standards. • The Constructor will develop and implement a Spill Prevention and Response Plan in accordance with the Project Agreement. • A Wetland Water Balance Risk Evaluation will be completed for the layover facilities at detail design as soon as the design is sufficiently advanced to make such an assessment possible to limit the risk of unexpected delays due to potential monitoring requirements.	• If potential environmental impacts are subsequently identified as part of detailed design, applicable legislation will be adhered to and all applicable environmental permits and/or approvals will be obtained prior to construction. • Turbidity levels within discharges from sites to be monitored visually. Turbidity levels will be monitored upstream and downstream of sites at watercourse crossings or adjacent to watercourses. Turbidity levels within discharges from sites and within receiving storm sewers will also be monitored visually to determine potential impacts from construction. • Grab samples for existing watercourses and/or wetlands, when runoff from the site discharges to a watercourse and/or wetland will be conducted for pre-construction, during construction, and post construction conditions until the site is considered stabilized. Grab samples for watercourses and wetlands will be taken for non-precipitation event and for precipitation events to obtain a reasonable understanding of the turbidity levels. Post-construction monitoring of wetland areas may be required depending on input from Conservation Authorities. • Monitoring will be conducted for potential oil spills and containment of spills to be conducted as per provincial requirements. • Functionality of stormwater quantity controls including peak flows and water levels for storm events within the design range. Monitoring would require local rainfall data. • Infiltration targets, measured by flow monitoring on infiltrative Low Impact Development (LID) Best Management Practices (BMPs). • Stormwater quality measures will be assessed to provide a minimum 80% Total Suspended Solids (TSS) removal as per the MECP *Stormwater Management Planning and Design Manual* (2003). Where applicable, additional water quality requirements as per the LSRCA's Lake Simcoe Phosphorus Offsetting Program (LSPOP). • Within LSRCA's jurisdiction, Phosphorus levels immediately downstream of sites will be monitored and compared to baseline conditions determined prior to construction.
USRC Hydro One Conflicts	• Construction of an underground utility corridor • Construction of utility bridges • Construction of the new and	Potential Impacts and Proposed Mitigation Measures for Stormwater and Site Drainage	• The proposed construction activities pose a potential impact due to sediment transport into adjacent natural areas including watercourses, wetlands and municipal drainage infrastructure.	• Construction activities, however, pose a potential impact due to sediment transport into adjacent natural areas including watercourses, such as the Don River Valley. Therefore, the following mitigation measures and monitoring commitments are proposed: • Prepare and implement a Drainage and Stormwater Report, an Erosion and Sediment Control Plan, detailed drainage design and erosion and sediment control drawings in accordance with the Ministry of the Environment, Conservation and Parks (MECP) Stormwater Management Planning and Design Manual (2003), the Greater Golden Horseshoe's Erosion and Sediment Control Guideline for Urban Construction (December, 2006), as amended from time to time, and the guidelines and regulatory requirements of the Conservation Authority having jurisdiction.	• Grab samples for existing watercourses and/or wetlands, when runoff from the site discharges to a watercourse and/or wetland will be conducted for pre-construction, during construction, and post construction conditions until the site is considered stabilized. Grab samples for watercourses and wetlands will be taken for non-precipitation event and for precipitation events to obtain a reasonable understanding of the turbidity levels. Post-construction monitoring of wetland areas may be

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
	expanded Don Fleet JCT			• The overall stormwater quality and quantity control strategy will be developed in accordance with all relevant municipal, provincial and federal requirements, as amended, as well as the requirements of Conservation Authorities having jurisdiction. • Infiltration requirements for municipalities will be determined as per the design guidelines and standards. • Develop and implement a Spill Prevention and Response Plan in accordance with the Project Agreement.	required depending on input from Conservation Authorities. • Monitoring will be conducted for potential oil spills and containment of spills to be conducted as per provincial requirements. • Functionality of stormwater quantity controls including peak flows and water levels for storm events within the design range. Monitoring would require local rainfall data. • Infiltration targets, measured by flow monitoring on infiltrative Low Impact Development (LID) Best Management Practices (BMPs).

***NOTES:**
Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time.

TABLE 4-135: SUMMARY OF GROUNDWATER MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
Installation of OCS	• Excavate soil • Install OCS foundations at an approximate depth of 5m • Erect poles • Install wiring • Tree removals	Excavated Materials	• Construction operations could expose contaminated materials and/or result in the spreading of contaminated materials	• Develop a Soil and Excavated Materials Management Plan for the handling, management and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the work. The plan will be overseen by a Qualified Person pursuant to *Ontario Regulation 153/04* under the *Environmental Protection Act* (QP) and will comply with *Ontario Regulation 406/19* (On-Site and Excess Soil Management – to be enacted into law on January 1, 2021), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s *Management of Excess Soils: A Guide for Best Management Practices* (April 2019, as amended) and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement, as applicable. • Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per *Ontario Regulation 347* (as amended) and all Applicable Law. • The soil and Excavated Materials Management Plan will be reviewed and approved by Metrolinx prior to construction.	• A Soil and Excavated Material Monthly Dashboard Report will be developed by the Constructor for Metrolinx review that includes monitoring and performance data related to the management of excavated materials for the preceding month. • Upon completion of the work, the Constructor will submit a Soil and Excavated Material Management Implementation Report to Metrolinx.
		Groundwater	• Construction operations could expose groundwater and associated contamination	• Develop a Groundwater Management and Dewatering Plan to guide the handling, management, and disposal of groundwater encountered during the works. The Groundwater Management and Dewatering Plan will be overseen by a QP and will comply with *Ontario Regulations 406/19* (On-Site and Excess Soil Management – to be enacted into law on January 1, 2021), *64/16* and *387/04*, as amended under the *Ontario Water Resources Act*. • The Groundwater Management and Dewatering Plan will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement. The Groundwater Management and Dewatering Plan will outline general groundwater monitoring considerations during the works and provide guidance for groundwater monitoring following the works where considered applicable. • The Groundwater Management and Dewatering Plan will describe the anticipated groundwater quantity and dewatering Zone of Influence that will be encountered during the works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) or an Environmental Activity Sector Registry (EASR) from the MECP. • The Groundwater Management and Dewatering Plan will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the works, and approvals for the water disposal, and/or treatment if applicable, based on the quantity and quality. • The Groundwater Management and Dewatering Plan will be reviewed and approved by Metrolinx prior to construction.	• A Groundwater Management Monthly Dashboard Report will be developed by the Constructor for Metrolinx review to document performance monitoring data/results and any corrective actions implemented during the previous month. • Upon completion of the work, the Constructor will submit a Groundwater Management and Dewatering Implementation Report to Metrolinx.
			• Temporary drawdown of groundwater due to construction dewatering • Contamination of groundwater due to spill of fuels/oils	• Irrespective of the need for a PTTW or registry of the water taking on the EASR, an adequate Erosion and Sediment Control Plan, and/or Discharge/Mitigation Plan will be prepared before construction starts for work near surface water features. • Development of Emergency Preparedness and Spill Response Plan • Implement proper equipment re-fueling procedures	• Develop and implement Emergency Preparedness and Spill Response Plans • Prepare and Implement a Dewatering Management Plan • Apply for PTTW or EASR registration if required, to be evaluated during Detailed Design. MOECC guidance document will be consulted and/or consultation with Ministry staff as appropriate.
Operation/ Maintenance of OCS	• Tree pruning/maintenance		• Contamination of groundwater due to spill of fuels/oils	• Development of Emergency Preparedness and Spill Response Plan • Implement appropriate equipment re-fueling procedures	• Develop and implement Emergency Preparedness and Spill Response Plans
All Project Components	• All		• Potential adverse effects to groundwater and/or wells	• Refer to monitoring/commitments column	• Any/all requirements for dewatering associated with project activities including but not limited to OCS installation etc. will be reviewed and confirmed during Detailed Design. • With respect to bridge replacements, a detailed assessment of any potential groundwater/well

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
					impacts will be completed as part of a separate EA Addendum process as outlined in the GO Rail Network Electrification EPR. • The potential impact on groundwater due to project activities is expected to be imperceptible; however, this will be further evaluated at the Detailed Design phase along with the requirement to prepare an Erosion and Sediment Control Plan and/or a Discharge/Mitigation Plan, obtain a PTTW or register the water taking on the EASR. MOECC guidance document will be consulted and/or consultation with Ministry staff as appropriate. • Irrespective of the need for a PTTW or registry of the water taking on the EASR, an adequate Erosion and Sediment Control Plan, and/or Discharge/Mitigation Plan will be prepared before construction starts for work near surface water features. • If additional potential impacts to water supply wells are identified during the Detailed Design phase, additional assessment will be carried out as appropriate, including well surveys, consultation with municipalities and other related investigative tasks. • If any potential impact to water supply wells is identified during the Detailed Design phase of the project, additional assessment may be required, including well surveys, consultation with municipalities and other related investigative tasks. • Some of the rail corridor segments and proposed facilities are located within Wellhead Protection Areas (WHPA) and/or within 500 metres municipal supply wells. It is a general conclusion that, due to the typical installation depths of municipal supply wells and the relatively small and shallow foundations required for the proposed OCS support structures, any impact from the GO Rail Network Electrification Project is considered to be highly unlikely. However, further assessment will be conducted during the Detailed Design phase of the project for any proposed OCS support structures situated within WHPA and/or close proximity of municipal supply wells, to ensure there is no impact to municipal water supplies.

***Notes:**
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If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies.

TABLE 4-136: SUMMARY OF TRAFFIC MITIGATION AND MONITORING COMMITMENTS

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
Installation of OCS	• Excavate soil • Install OCS foundations at an approximate depth of 5m • Erect poles • Install wiring • Tree removals	• Traffic	• Construction may result in the need for temporary road or lane closures changing access to nearby land uses	Metrolinx (or their Contractor) will coordinate with Municipalities and road authorities during detailed design to develop traffic, parking, transit, cycling and pedestrian management strategies prior to commencement of construction to avoid or minimize traffic interference to the extent possible during construction. The following will guide the development of Traffic Management Plans: • Traffic Control and Management Plan will take into account any trees or vegetation that require proactive pruning/injury/removal/clearing due to the high volume of large vehicles that might require more clearance. • Traffic Control and Management Plan(s) will be developed prior to construction to maintain reasonable access through work zones, to the extent possible. • Access to nearby land uses will be maintained to the extent possible. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur. • Potential effects to pedestrian and cyclist activities during construction will be mitigated through the installation of appropriate wayfinding, regulatory, and warning signs.	The following monitoring activities will be carried out during the construction phase: • Traffic impacts to be monitored in accordance with the Traffic Control and Management Plan and adjusted as necessary during the construction period. • Cycling network impacts to be monitored in accordance with the Construction Traffic Control and Management Plan and adjusted as necessary during the construction period.
Layover/Storage Yard Facilities	• Construction of OCS at the Walkers Line Layover Facility • Construction of OCS at the Unionville Storage Yard Facility • Construction of OCS at the midland Layover Facility	• Traffic	• Construction may result in the need for temporary road or lane closures changing access to nearby land uses	Metrolinx (or their Contractor) will coordinate with Municipalities and road authorities during detailed design to develop traffic, parking, transit, cycling and pedestrian management strategies prior to commencement of construction to avoid or minimize traffic interference to the extent possible during construction. The following will guide the development of Traffic Management Plans: • Traffic Control and Management Plan will take into account any trees or vegetation that require proactive pruning/injury/removal/clearing due to the high volume of large vehicles that might require more clearance. • Traffic Control and Management Plan(s) will be developed prior to construction to maintain reasonable access through work zones, to the extent possible. • Access to nearby land uses will be maintained to the extent possible. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur. • Potential effects to pedestrian and cyclist activities during construction will be mitigated through the installation of appropriate wayfinding, regulatory, and warning signs.	The following monitoring activities will be carried out during the construction phase: • Traffic impacts to be monitored in accordance with the Traffic Control and Management Plan and adjusted as necessary during the construction period. • Cycling network impacts to be monitored in accordance with the Construction Traffic Control and Management Plan and adjusted as necessary during the construction period.
USRC Hydro One Conflicts	• Relocation of circuits to an underground utility corridor, utilizing utility bridges: o Install surface troughs	• Traffic	• Construction may result in the need for temporary road or lane closures changing access to nearby land uses	The following mitigation measures are recommended to ensure safe movement of vehicles and pedestrians during construction of the proposed infrastructure within the USRC: • Traffic Control and Management Plan(s) will be developed prior to construction to maintain reasonable access through work zones, to the extent possible. • Access to nearby land uses will be maintained to the extent possible. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur.	• Traffic impacts to be monitored in accordance with the Traffic Control and Management Plan and adjusted as necessary during the construction period. • Cycling network impacts to be monitored in accordance with the Construction Traffic Control and Management Plan and adjusted as necessary during the construction period.

Project Component	Project Activities	Environmental Component	Potential Effect	Mitigation Measures/Commitments	Monitoring Commitments
	○ Install cable banks ○ Install utility bridges • New Don Fleet Junction: ○ Remove Hydro Tower #10A ○ Excavate soil ○ Install BPEX foundations ○ Erect BPEX structures ○ Install wiring ○ Tree removals ○ Install Durisol© walls • Expanded Don Fleet Junction: ○ Install wiring ○ Tree removals ○ Install Durisol© walls			• Potential effects to pedestrian and cyclist activities during construction will be mitigated through the installation of appropriate wayfinding, regulatory, and warning signs. • Ensure that the public is notified in advance of any potential service disruptions. • Partial or full road closures may be required as a result of construction staging for the utility bridge installations at Lower Sherbourne Street, Parliament Street and Cherry Street. Clearly delineated, and appropriately signed route options, with clearly marked detours will be provided during construction, where required; • Consult with local transit agencies to establish a suitable mitigation strategy to be implemented. • Traffic impacts to be monitored in accordance with the Construction Traffic Control and Management Plan and adjusted as necessary during the construction period. • A sightline analysis for southbound traffic under the proposed utility bridges will be reviewed by the Contractor and will take into account City of Toronto Guidelines. • The Contractor will be responsible for completing a photometric analysis to ensure safe traffic movements. Depending on the results of the analysis, additional mitigation measures may be proposed to minimize potential traffic impacts (e.x. installation of additional signage or advance warning signals/lights). • The utility bridges will be designed in a way to prevent/minimize ice accretion and water build up. • For potential impacts related to pedestrian traffic along the Lower Don Trail, refer to the Land Use & Socio-Economic commitments table.	

***Notes:**
Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time.
If clarification is required regarding regulatory requirements, consult with the appropriate regulatory agencies.

5 Consultation

In accordance with Section 15 of Ontario. Reg. *231/08 Transit Projects and Metrolinx Undertakings* (the Regulation), Metrolinx engaged in consultation with the public, property owners, review agencies, Indigenous Nations & organizations and other stakeholders during the Significant Addendum to the GO Rail Network Electrification TPAP. A detailed summary of stakeholder feedback and comments received and how they were considered throughout the addendum process have been provided in this section.

Consultation in advance of the Notice of EPR Addendum was commenced formally on January 30, 2020 with the publication of the Notice of Public Meeting (see Section 5.3.1.1). However, informal consultation had been ongoing since late 2017 with review agencies and other interested parties after issuing the Statement of Completion for the GO Rail Network Electrification TPAP, as described in the following sections.

A Consultation Record, summarizing the consultation activities carried out by Metrolinx and Hydro One as part of the GO Rail Network Electrification EPR Addendum including the various consultation events held, feedback/comments received from review agencies, Aboriginal Communities, and other stakeholders including members of the public, and how those comments were considered as part of the TPAP are documented in **Appendix M**.

5.1 Consultation Strategy Overview

The objectives for the consultation strategy remained the same as those from the 2017 GO Rail Network Electrification TPAP. The key elements of this strategy and how they were executed are summarized in detail below.

The main goals in the communications and consultation/stakeholder engagement approach for the GO Rail Network Electrification EPR Addendum were as follows:

- Meet the requirements of O. Reg. 231/08, s. 15;
- Attract and engage a diverse set of stakeholders;
- Communicate the rationale for electrification;
- Provide opportunities for interested stakeholders to provide input and feedback on the update to the proposed project design and the consultation process; and
- Educate stakeholders and promote an understanding amongst participants regarding GO Rail Network Electrification Addendum, key decision points, the project milestones and timelines and next steps following completion of the EPR Addendum.

In an effort to engage a diverse set of participants, provide information and updates on the project, and to allow opportunities for interested persons to provide comments and feedback throughout the process, the following methods of consultation were employed:

- Online, via Metrolinx Engage[95];

[95] Metrolinx Engage is an online engagement tool which provides an additional online experience through social media, GIS resources, and live comment feeds. This website provides a comprehensive hub for interested stakeholders to learn more about a variety of Metrolinx initiatives and find out how they can participate and provide feedback while interacting with content. It is further discussed in Section 5.2.2

- Project e-mail addresses (IndigenousRelations@metrolinx.com and GOExpansionTPAP@metrolinx.com) or the appropriate Metrolinx Regional Representative at the following emails:
  - TorontoEast@metrolinx.com (residents east of Don River)
  - TorontoWest@metrolinx.com (residents west of Don River)
  - HaltonRegion@metrolinx.com
  - DurhamRegion@metrolinx.com
  - YorkRegion@metrolinx.com
  - Peel@metrolinx.com
  - SimcoeCounty@metrolinx.com
- Public Open Houses and Public Review Opportunities;
- Newspaper Advertisements;
- Notifications and Email Updates;
- Meetings with Review Agencies (Federal, Provincial, Municipal and Conservation Authorities);
- Meetings with Elected Officials;
- Notifications to Indigenous Nations & organizations;
- Meetings with Other Stakeholders (e.g., transit authorities, utilities); and
- Notifications to Property Owners.

Metrolinx attempted to conduct consultation activities which were accessible, as defined by the Accessibility for Ontarians with Disabilities Act (AODA). This includes hosting events in AODA compliant facilities, providing multiple methods for providing feedback and reviewing materials.

5.1.1 Integration with GO Expansion Program Consultation Activities

Due to the changes to the project associated with the Significant Addendum to the GO Rail Network Electrification TPAP, it was necessary to conduct renewed consultation activities under Section 15 of O. Reg 231/08. To ensure that stakeholders had the opportunity to comment on the project in advance of the prescribed review period following distribution of a Notice of EPR Addendum, additional consultation activities were undertaken.

Metrolinx engaged in a variety of projects under its GO Expansion Program Update to help improve GO Rail service within the Greater Golden Horseshoe. The projects included within the GO Expansion Program are as follows:

- New Track and Facilities TPAP;
- Scarborough Junction Grade Separation TPAP;
- Stouffville Rail Corridor Grade Separations TPAP;
- Network-Wide Structures Project (Significant Addendum to the Barrie Rail Corridor Expansion Project Environmental Project Report 2017); and
- GO Rail Network Electrification (Significant Addendum to the GO Rail Network Electrification Environmental Project Report 2017).

In order to more efficiently present information on multiple, interrelated aspects of the GO Expansion Program, and so that interested persons could participate in combined meeting sessions, consultation activities for the Significant Addendum to the Electrification TPAP were undertaken in combination with the rest of the GO Expansion Program. As such, the notifications, meetings, and Public Information Centres detailed in the following sections include information related to other GO Expansion Programs.

5.1.2 Stakeholder Engagement Methods/Tools/Activities

5.1.2.1 Stakeholder Contact List

The Stakeholder Contact List developed as part of the GO Rail Network Electrification TPAP, was carried forward and updated (as required) to facilitate consultation activities associated with the EPR Addendum. The list consisted of the following stakeholder groups: members of the public, property owners, Indigenous Nations & organizations, review agencies (federal, provincial, municipal and conservation authorities), elected representatives, utility companies, transit authorities, community/interest groups, and other rail operators. The contact list contained the names, addresses, phone numbers and email addresses of each individual so that they could receive project updates throughout the project and addendum. This list was continually updated and augmented as the project progressed.

5.2 Online Engagement

Digital engagement tools were employed as part of a comprehensive and accessible EPR Addendum consultation program, with online consultation envisioned as a significant aspect of the consultation approach. The use of digital engagement tools allows for interested stakeholders to receive information and project updates, as well as to submit comments and questions directly to the project team in a variety of ways. The project website (hosted via *Metrolinx Engage*) was used as part of the online engagement in order to notify stakeholders of project updates and public meetings, provide key project information, and provide a mechanism for receiving stakeholder comments and feedback, as described below.

5.2.1 Electrification Project Website

During the consultation period for the Significant Addendum to the GO Rail Network Electrification TPAP, project material hosting and online engagement was handled through the Metrolinx Engage website.

5.2.2 Metrolinx Engage

The Metrolinx Engage website (www.metrolinxengage.com) is an online engagement tool which provides an additional online experience through social media, GIS resources, and live comment feeds. This website provides a comprehensive hub for interested stakeholders to learn more about a variety of Metrolinx initiatives and find out how they can participate and provide feedback while interacting with content. The intent of the site is to provide a digital equivalent to attending a public meeting in person.

Project information is posted directly on the website as well as via downloadable documents, and visitors are encouraged to log in and ask questions regarding the material. Buttons are available for participants to share the information via Facebook, Twitter and LinkedIn. A Social Hub component of the website also summarizes all of the social media posts (Twitter, Facebook, Instagram, etc.) relating to Metrolinx projects in one place. Information posted includes all project notices (including advertisements for Public Meetings – Rounds 1, 2 and 3),

and all materials presented at the Public Meetings (including display boards, discussion guides, and info sheets).

Any feedback received through the Metrolinx Engage website regarding electrification was forwarded to the Project study team for inclusion in the comment summaries. These comments were afforded the same weight as all other comments.

5.2.2.1.1 Project Email Addresses

In order to liaise with interested stakeholders, Metrolinx utilized two email addresses to send out notifications and receive responses related to the project; for Indigenous Nations & organizations correspondence (IndigenousRelations@metrolinx.com) and for all other correspondence (GOExpansionTPAP@metrolinx.com). In some instances, responses to public inquiries were issued by the appropriate Metrolinx Regional Representative at the following emails:

- TorontoEast@metrolinx.com (residents east of Don River)
- TorontoWest@metrolinx.com (residents west of Don River)
- HaltonRegion@metrolinx.com
- DurhamRegion@metrolinx.com
- YorkRegion@metrolinx.com
- Peel@metrolinx.com
- SimcoeCounty@metrolinx.com

For public notices, interested stakeholders were directed to use metrolinxengage.com to receive additional project information and provide comments.

5.2.2.2 Public Meetings and Correspondence

Metrolinx hosted a total of four (4) rounds of public meetings, each occurring over multiple dates. Only the first round of meetings were held in person, with the remainder hosted virtually on Metrolinx Engage (i.e. virtual open houses) due to COVID-19. Round 1 meeting locations were spread around the GTHA, and were chosen to ensure sufficient geographic coverage of the project study area so as to meet with as many people as possible face to face, satisfying the consultation objectives. All four rounds occurred prior to the issuance of Notice of EPR Addendum, and are detailed further in Sections 5.3.1 to 5.3.4.

5.2.2.3 Public Meeting Notices

Newspaper advertisements for the Notice of Public Meeting – Round 1 and Notice of EPR Addendum were published in local newspapers and online publications with distribution in vicinity of the corridors, as well as online at the websites and social media sites listed above throughout the project. The notices for the second, third and fourth public meetings were not published in local newspapers, but were distributed online using the above-noted methods for online engagement. Notifications were also distributed to those on the Stakeholder Contact List in advance of all public meetings.

Table 5-1 summarizes all notices published as part of the EPR Addendum consultation process.

TABLE 5-1: SUMMARY OF PUBLIC NOTICES PUBLISHED

Notice Type	Date	Publication Location
GO Expansion Public Meeting Round #1	February 18 – February 29, 2020	Multiple Newspapers, see **Table 5-2**
GO Expansion Public Meeting Round #2	August 18 – September 1, 2020	Online, see Section 5.3.2.1
GO Expansion Public Meeting Round #3	November 27 – December 11, 2020	Online, see Section 5.3.2.1
Don Fleet Junction Update	February 2 – February 11, 2021	Online, see Section 5.3.4
Notice of EPR Addendum	February 22, 2021	Multiple Newspapers / Online, see Section 5.9

5.2.2.4 French Translations

As a government agency operating under the principles of the *French Language Services Act* (*FLSA*), Metrolinx is committed to providing services in French in designated areas of the province. The agency works to ensure the availability and accessibility of quality services in French system-wide. Following these principles, Metrolinx provided a French translation of all notices and newspaper ads for the project.

5.3 Public Consultation

5.3.1 GO Expansion Public Information Centre Round #1

The first round of public meetings for the GO Expansion Program was held in February of 2020, which included information on the various projects involved in the expansion of the GO Rail Network, including the Significant Addendum to the Electrification TPAP. The following section summarizes the consultation efforts undertaken by Metrolinx as part of this round of public meetings as well as the type of feedback that was received and how it was considered by Metrolinx.

5.3.1.1 Notice of Public Meeting

Metrolinx posted a Notice of Public Meeting to inform stakeholders of the opportunity to participate in the Round 1 public meetings. This Notice ran from January 31, 2020 to February 8, 2020 in newspapers which had geographic coverage of the Project study area. **Table 5-2:** lists the newspapers in which advertisements were published and the respective dates that they were featured.

In addition, a French and English version of this advertisement were made available, as per the requirements described in Section 5.2.2.4 on the Metrolinx Electrification website. Copies of the English and French Newspaper Ads are included in **Appendix M2**.

TABLE 5-2: SUMMARY OF PUBLIC MEETING ROUND 1 NEWSPAPER ADVERTISEMENTS

Publication	Dates Published
Toronto Star (includes online version)	February 1, 2020 February 8, 2020
Toronto/Mississauga Le Metropolitan	January 20, 2020 February 6, 2020
Toronto L'Express	January 31, 2020 February 7, 2020

5.3.1.2 Public Meetings Overview and Locations

The intent of the Round 1 public meetings was to introduce the GO Expansion Program and the various projects involved, including the Significant Addendum to the Electrification TPAP. The public meetings were held in February 2020 to allow for more detailed EA and design information to be confirmed and developed prior to the next round of public meetings.

Ten (10) public open houses were held at various locations throughout the network between February 18-29, 2020. Locations for public meetings were chosen based on the proposed siting of new infrastructure. Holding public meetings in these strategic locations aimed to provide opportunity for individuals across a wide geographic area to be able to participate in the meetings. All 10 public meeting venues were accessible, and display boards were placed in areas that were also accessible.

All public meetings were held as joint meetings, with staff from the various GO Expansion Program working groups present to provide information on specific aspects of the GO Expansion Program, including electrification. **Table 5-3** below provides a summary of when and where the public meetings took place.

TABLE 5-3: PUBLIC MEETING DATES AND LOCATIONS

Markham PIC **Tue Feb 18, 2020** Markham Village Community Centre 6041 Highway 7 Markham, ON L3P 3A7 **6:30 p.m. – 8:30 p.m.**	**Don Valley PIC** **Tue Feb 25, 2020** Evergreen Brick Works 550 Bayview Ave Toronto, ON M4W 3X8 **6:30 p.m. – 8:30 p.m.**	**Vaughan PIC** **Sat Feb 29, 2019** Vaughan City Hall 2141 Major Mackenzie Dr W Vaughan, ON L6A 1T1 **11:30 a.m. – 1:30 p.m.**	**Barrie PIC** **Wed Feb 19, 2020** South Shore Community Centre 205 Lakeshore Dr Barrie, ON L4N 7Y9 **6:30 p.m. – 8:30 p.m.**	**Burlington PIC** **Wed Feb 26, 2020** Central Recreation Centre 519 Drury Ln Burlington, ON L7R 2X3 **6:30 p.m. – 8:30 p.m.**
Whitby PIC **Sat Feb 29, 2019** Abilities Centre 55 Gordon St Whitby, ON L1N 0J2 **11:30 a.m. – 1:30 p.m.**	**Aurora PIC** **Mon Feb 24, 2020** Aurora Community Centre 1 Community Centre Ln Aurora, ON L4G 7B1 **6:30 p.m. – 8:30 p.m.**	**Agincourt PIC** **Wed Feb 26, 2020** Metropolitan Centre 3840 Finch Ave E Toronto, ON M1T 3T4 **6:30 p.m. – 8:30 p.m.**	**Scarborough PIC** **Mon Feb 24, 2020** Scarborough Civic Centre 150 Borough Dr Toronto, ON M1P 4N7 **6:30 p.m. – 8:30 p.m.**	**Downtown PIC** **Thu Feb 27, 2020** George Brown College 80 Cooperage St Toronto, ON M5A 0J3 **6:30 p.m. – 8:30 p.m.**

The meetings provided the public an opportunity to review display boards and meet with staff one on one to discuss the project. The display boards were posted and staffed for the duration of the event. Comment sheets (see **Appendix M4**) were provided to all attendees as the primary mechanism for submitting comments and feedback on the project and a summary report was prepared to document the sessions (see **Appendix M4**). This report outlined how stakeholders were engaged prior to and during meetings, how and what content was presented, meeting attendance, and the types of feedback that were received. The display boards shown at the meeting covered the following topics:

- Overview of the GO Expansion Program
- GO Expansion – Electrification
- GO Expansion – New Track and Facilities TPAP
- Significant Addenda to the Barrie Rail Corridor Expansion TPAP
- Scarborough Junction Grade Separation Project
- Stouffville Rail Corridor Grade Separations Project
- Benefits of GO Expansion: Personal and Regional
- GO Expansion Program – Delivery Strategy and Service Levels
- Anticipated Timelines
- Natural Heritage Features & Species at Risk (SAR)
- Vegetation Removal and Compensation Program, including Tree Removal, Management Strategy and Compensation Approach
- Archaeology
- Cultural Heritage Resources
- System Wide Air Quality Studies
- System Wide Noise Studies

- Socio-Economic and Land Use
- EMF / EMI

A discussion guide was also provided with accompanying info sheets for various topics so that participants could view more detailed information and provide direct feedback to the study team. The following info sheets were provided at each meeting:

- Regional Benefits of GO Expansion
- Heritage Conservation
- Vegetation Removal and Compensation Program
- EMI/EMF Effects and Mitigation
- Grade Separations
- New Approach to Construction Management

Copies of the presentation boards, discussion guide, and info sheets can be found in **Appendix M4**.

5.3.1.3 Roll Plans

Conceptual roll plans were developed and displayed at each public meeting session, providing mapping of each corridor included within the scope of the Electrification EPR Addendum. The maps featured the OCS Impact/Vegetation Removal Zones, Traction Power Facility (TPF) sites and ancillary components (including feeder routes) approved as part of the 2017 TPAP as well as new areas of impact being assessed as part of the EPR Addendum.

NT&F TPAP proposed infrastructure was also incorporated, including proposed track design, switches, layover facilities, new platforms at some GO stations, as well as potential property impacts.

5.3.1.4 Summary of Attendance and Public Comments Received

Prior to and during the first Public Meeting period (January/February 2020), comments were received via a variety of communication channels: e-mails, letters, and comment forms. During the PIC, three different comment forms were provided: one at each information station, one to provide comments on other Metrolinx projects, and one to provide feedback on the meeting format and materials

A total of 450 members of the public signed in at the events. 130 written comment forms were submitted during the Public Meetings, and 15 comments were submitted afterwards via mail and email. When a meeting attendee had a verbal comment, staff provided them with a comment form and encouraged them to write down their comments so that it could be formally addressed. Four (4) members of the public provided comments through email that were related to the scope of the GO Rail Network Electrification Addendum, specifically as it relates to noise and vibration as well as EMI/EMF impacts.

Most of the feedback received was related to topics that were outside the scope of the Electrification Project, many of which were more related to the other projects within the GO Expansion Program. Generally speaking, the public showed interest and support for the planned frequent, faster, and cleaner train service associated with electrification. Some participants were also interested in learning about the anticipated train technology for the future rail fleet, the interactions between electric and diesel locomotives, and hydrogen power. Key themes of the comments/feedback received that were specifically related to the Significant Addendum to the GO Rail Network Electrification TPAP are listed below:

- Implementation timelines for electrification;
- Speed and service improvements associated with electrified trains;
- Visual impacts of OCS infrastructure and OCS locations;
- The size and design of OCS infrastructure
- TPF proposed locations;
- Mixed fleets and partially electrified corridors;
- EMI/EMF impacts on property owners and businesses;
- Air quality improvements associated with electrification;
- The potential for mid-trip transfers between electrified and non-electrified trains on partially electrified corridors; and
- The possibility of hydrogen powered locomotives.

In addition, there were a number of comments on factors such as noise and air quality which are impacted by the improved level of service that electrification brings, though not directly related to electrification infrastructure.

Table 5-4 summarizes the key issues/comments/questions related to the GO Rail Network Electrification Addendum that were received from the public as part of the Round 1 public consultation, and how they were considered by Metrolinx. Copies of all public comments received can be found in **Appendix M7,** and the complete Public Meeting Summary Report, including descriptions of all comments received, can be found in **Appendix M4.**

TABLE 5-4: SUMMARY OF PUBLIC CONSULTATION ROUND 1 PUBLIC COMMENTS RECEIVED (FEBRUARY 2020 – JUNE 2020)

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
1	Via Email	Impact Assessment - Noise and Vibration	Various concerns about noise pollution resulting from increased train service. As well, lack of noise experts presents at Public Meetings to respond to these questions.	• In 2017, Metrolinx completed the GO Rail Electrification TPAP that evaluated areas where noise mitigation would be needed for the planned 15-minute electrified service. Since 2017, there has been a lot of planning work done to determine the service levels and infrastructure needed to meet future passenger demand. For operational train noise, Metrolinx is undergoing system-wide noise studies to identify impact and explore ways of mitigating noise by: • Proposing to electrify 7 rail corridors (Lakeshore East, Lakeshore West, Kitchener, Stouffville, Richmond Hill, Barrie, and Union Station Rail Corridor) to the maximum extent possible: o Electric trains are quieter than diesel trains currently used at speeds less than 100 km/hr. o Implementing silencers/mufflers on all existing diesel locomotives over a 5-year period. o This could reduce noise by 6 dB at the highest throttle setting.
2	Via Email	Impact Assessment – EM/EMF	Various concerns about potential EMI/EMF impacts on adjacent properties and proposed mitigation measures.	• An Electromagnetic Interference/Electromagnetic Fields (EMI/EMF) Impact Assessment was conducted as part of the GO Rail Network Electrification Transit Project Assessment Process (TPAP), which was approved in 2017. It assessed the impacts of converting six GO-owned rail corridors from diesel to electric propulsion, including: Union Station Rail Corridor, Lakeshore West Rail Corridor, a portion of the Kitchener Corridor, Barrie Rail Corridor, Stouffville Rail Corridor, and Lakeshore East Rail Corridor. • The Impact Assessment study determined that no adverse effects were anticipated due to the installation of the electrified system/facilities. Notwithstanding this, once the electric rolling stock has been determined during detailed design, additional EMI/EMF testing and verification will be completed to confirm the initial findings and establish any required mitigation measures. Additionally, no impacts are expected to adjacent properties with regards to power surges or impacts to other services such as telecommunications. • Please note that the full Electrification TPAP Environmental Project Report is available online at http://www.metrolinx.com/en/electrification/electric.aspx • Metrolinx is currently completing an additional EMI/EMF analysis for electrification of the Richmond Hill rail corridor, which was not assessed during 2017. This involved taking scans to establish baseline conditions prior to electrification. The study determined that, similar to the findings from 2017, no EMI/EMF impacts are anticipated; although these findings will be verified through additional study during detailed design. The complete EMI/EMF Impact Assessment Report for Electrification of the Richmond Hill corridor will be shared publicly once Metrolinx issues the Notice of Commencement for the New Track and Facilities TPAP.

5.3.2 GO Expansion Public Information Centre Round #2

Metrolinx hosted the second round of public consultation for the GO Expansion Program online from August 18 to September 1, 2020. In the second round of consultation Metrolinx introduced new proposed infrastructure, presented potential impacts and mitigation, and continued to seek feedback on potential impacts and proposed new infrastructure as part of the GO Expansion Program, particularly for the three TPAPS: (1) New Tracks & Facilities, (2) Scarborough Junction Grade Separation, and (3) Stouffville Rail Corridor Grade Separations.

The information presented at the second round of consultation on the GO Rail Network Electrification Addendum was limited to a description of key preliminary design and construction commitments, along with updates on the project schedule. Notwithstanding this, a number of comments were received related to the electrification project and scope. **Figure 5-1** shows a screenshot of the Metrolinx Engage GO Rail Network Electrification Addendum page during PIC #2.

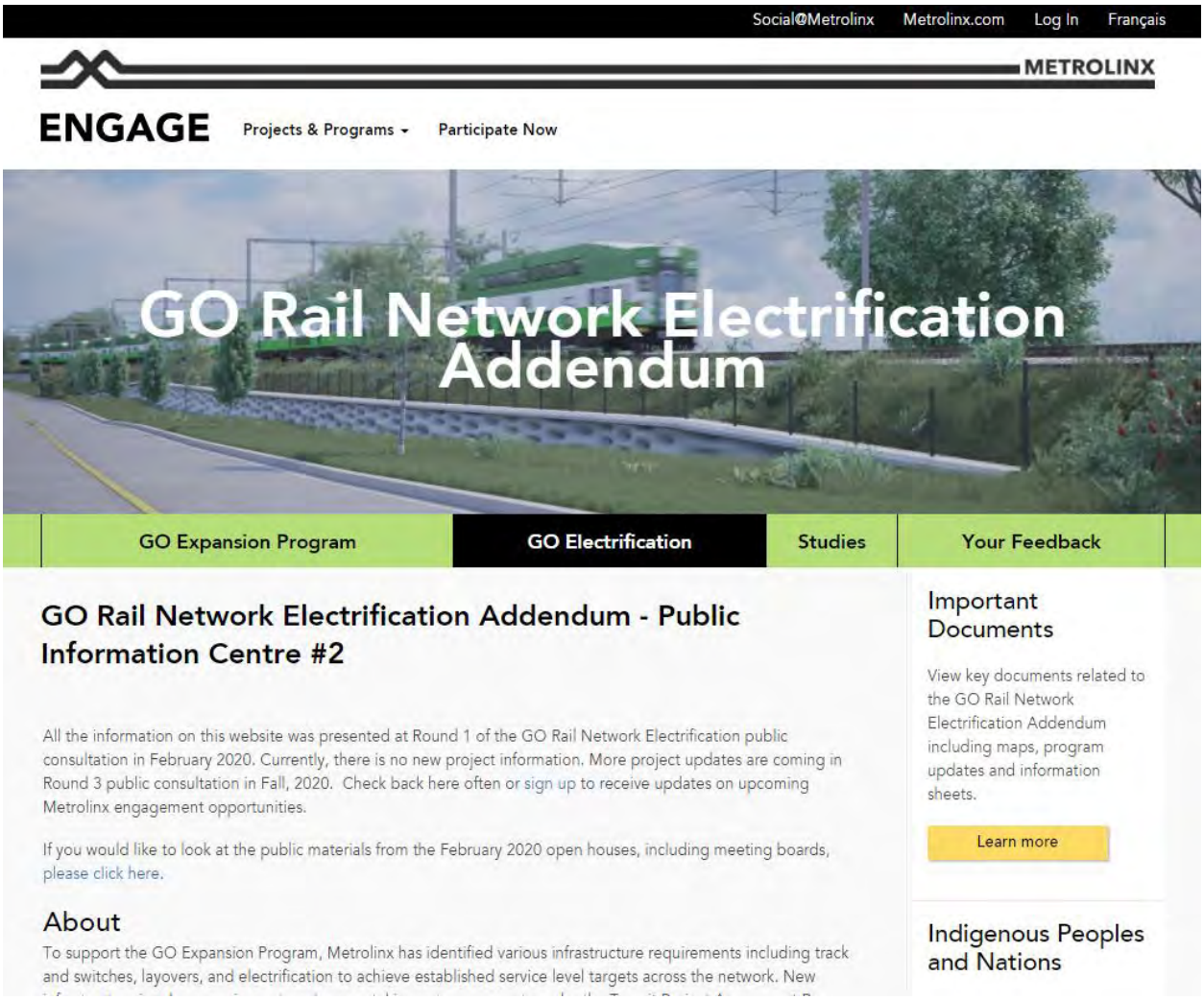

FIGURE 5-1: METROLINX ENGAGE GO RAIL NETWORK ELECTRIFICATION PAGE FOR PIC #2

As with the first Public Meeting period, a summary report was produced that outlined how stakeholders were engaged prior to and during meetings, how and what content was presented,

meeting attendance, and the types of feedback that were received. The information panels available online for review covered the following topics:

- New Track and Facilities TPAP – Proposed Beach Layover Facility[96]
- Effects and Proposed Mitigation Measures - Proposed Beach Layover Facility[96]
- New Track and Facilities TPAP – Proposed Unionville Storage Yard Facility
- Effects and Proposed Mitigation Measures - Proposed Unionville Storage Yard Facility
- New Track and Facilities TPAP – Proposed Walkers Line Layover Facility
- Effects and Proposed Mitigation Measures - Proposed Walkers Line Layover Facility
- New Track and Facilities TPAP – Proposed Don Valley Layover Facility
- Effects and Proposed Mitigation Measures - Proposed Don Valley Layover Facility
- Scarborough Junction Grade Separation Project – Study Results Panels
- Scarborough Junction Grade Separation Project – Midland Layover Facility
- Stouffville Rail Corridor Grade Separations Project – Study Results Panels
- GO Rail Network Electrification Addendum – Key Preliminary Design and Construction Commitments

5.3.2.1 Notice of Public Meeting

Metrolinx posted a Notice of Public Meeting to inform stakeholders of the opportunity to participate in the Round 2 public meetings. This notice was posted on Facebook, Instagram, LinkedIn and Twitter, as well as on Metrolinx-owned webpages such as Metrolinx News and the GOExpansion webpage.

Additional notification (apart from the notice distributed to those on the Stakeholder Contact List) included the circulation of a Metrolinx Regional Newsletter from August 21, 2020 to August 24, 2020 to interested parties who had signed up to receive Metrolinx news and the distribution of email notifications to participants from Public Information Centre Round #1.

These notices are included in **Appendix M2.**

5.3.2.2 Public Meetings Overview and Locations

As the Round 2 consultation efforts were held as a Virtual Open House, all consultation activities were hosted on the Metrolinx Engage website. The GO Expansion Program and its project-specific webpages were organized to clearly present information and seek feedback. The information on the webpages included a combination of both Round One and Round Two content and materials. Yellow boxes highlighted new information being presented throughout the different pages in Round Two, where applicable.

As in Round 1, the Electrification page included a page describing the project, a page including links to the associated project studies, a page containing links to important documents (such as the Virtual Open House materials), and a page for the public to ask questions about the project. A series of panels were included to provide updates on key preliminary design and construction commitments, and an updated schedule was also made available.

5.3.2.3 Roll Plans

The roll plans from PIC #1 were updated to show the changes to the Electrification Addendum study area since they were first shown. This included changes to associated electrification addendum footprints, such as the addition of Walkers Line Layover. The maps featured the

[96] The proposed Beach Layover was subsequently removed from the scope of the New Track and Facilities TPAP following this round of consultation

OCS Impact/Vegetation Removal Zones, Traction Power Facility (TPF) sites and ancillary components (including feeder routes) approved as part of the 2017 TPAP, as well as new areas of impact being assessed as part of the EPR Addendum.

5.3.2.4 Summary of Attendance and Public Comments Received

As the Virtual Open House format for PIC #2 required that all participants use Metrolinx Engage to view materials, the majority of comments were received through Metrolinx Engage. While comment forms were not used as part of this round of consultation, interested parties were still permitted to provide feedback through emails, letters, and phonecalls. The EPR Addendum webpage received over 1,500 views.

Sixteen (16) questions and comments were posted on the Electrification Ask-a-Question page, which were subsequently answered by staff. In addition, one (1) question related to electrification was posted on the NT&F Ask-a-Question page. A summary of the general question and comment topics submitted on Metrolinx Engage are as follows:

- **Timeline for electrification infrastructure and service**. Many participants wanted to learn more about Metrolinx's timeline for electrification, both for construction of supporting infrastructure and electric service. Participants also wanted more specific details about which corridors will have electric trains and how many, and the mixture and amount of trains that will go through the Union Station Rail Corridor after service expansion. A participant wanted to know if electrification infrastructure is still required if the future train service will use hydrogen powered trains. There was also a suggestion to consider using battery powered trains instead.
- **Operational noise and air quality impacts**. Participants shared concerns about potential operational noise and air quality impacts from expanded service using both diesel and electric trains. Participants would like to know about the assessment criteria for noise walls, and where noise walls will be proposed. There was also a concern shared about incremental noise impacts along the Lakeshore East Corridor from additional services, and that increased noise impacts are a public health issue.
- **Vegetation Compensation and Removal Program**. Participants would like to know about Metrolinx's timelines for vegetation removals, particularly along Lakeshore East Corridor, between Eastern Avenue and Coxwell.
- **Construction Noise and Management**. Participants would like to know more about how construction will be managed and notification to adjacent residents/businesses. They also wanted to know how any construction related noise complaints will be dealt with.
- **TPAP Addenda process**. A suggestion was received for a longer public review period and that the 30-day public review of the EPR Addenda may be too short.

Two (2) emails were received following the distribution of the Notice of Public Meeting, which included questions regarding TPF infrastructure and diesel service along the USRC.

Table 5-5 summarizes the key issues/comments/questions related to the GO Rail Network Electrification EPR Addendum that were received from the public as part of the Round 2 public consultation, and how they were considered by Metrolinx. Copies of emails and their respective responses, along with the posts made on Metrolinx Engage, are included in **Appendix M7,** and the complete Public Meeting #2 Summary Report can be found in **Appendix M5.**

TABLE 5-5: SUMMARY OF PUBLIC CONSULTATION ROUND 2 PUBLIC COMMENTS RECEIVED (AUGUST 2020 – OCTOBER 2020)

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
1	Metrolinx Engage	EA Process - Review Timelines	I notice you are only releasing the EPR Addenda in "Fall 2020" subject to a 30 day public and stakeholder review. That gives very our communities very little time to read it and digest the information enough to give relevant feedback on it. 1. Why is this 30 day release and consult process not extended? 2. What will Metrolinx do with the feedback from the community?	The Notice of EPR Addendum is anticipated to be filed in early 2021, which represents a change from the schedule presented earlier this year at the first round of Public Open Houses (POHs). This change was made to coincide the filing of the Notice of EPR Addendum with the Notice of Completion for the New Track & Facilities TPAP. Please refer to the information at the following link for the latest project timeline: https://www.metrolinxengage.com/sites/default/files/electrification_addendum_timeline_-_v6r1.pdf Metrolinx greatly values community input. In an effort to engage the public and provide opportunities to review and comment on the project in advance of the EPR Addendum filing, Metrolinx will have hosted three (3) separate rounds of POHs. The first round was held in February 2020, the second round is currently being held virtually from August 18 to September 1, and the third round is anticipated to be held virtually in Fall 2020. These POHs are intended to present relevant project information (including project designs, potential impacts, and proposed mitigation measures) as details become available and solicit feedback from participants and interested stakeholders. The 30-day public and stakeholder review period of the EPR Addendum is a regulatory standard and will be undertaken in accordance with requirements outlined in Ontario Regulation 231/08 - Transit Projects and Metrolinx Undertakings. All feedback that is received as part of the project (including POHs) will be included as part of the Consultation Record and will be considered as part of the 35-day Minister's review before a decision on the project is issued. Metrolinx is required to demonstrate how public and stakeholder comments that were received were considered and/or addressed as part of the project. Please refer to the following link for a copy of the Public Meeting Summary Report from the first round of POHs, which shows how we have collected and considered public comments: https://www.metrolinxengage.com/sites/default/files/go_expansion_public_meeting_round_1_final_summary_report_comp.pdf Metrolinx is currently undertaking system-wide Noise and Vibration and Air Quality Studies associated with increased service levels. Further information, including results of these studies and proposed mitigation are anticipated to be available in Fall 2020 and will be presented at the third round of Public Open Houses. Should you have questions or concerns after reviewing the study results and location of proposed mitigation, Metrolinx would be pleased to provide further clarification or discussion in an effort to address any remaining concerns.
2	Metrolinx Engage	Electrification Benefits and Impacts – Noise and Vibration Mitigation	Questions and concerns regarding the criteria for noise wall installation, and if communities can request noise walls.	Metrolinx is currently undertaking system-wide Noise and Vibration and Air Quality Studies associated with increased service levels. Further information, including results of these studies and proposed mitigation along the Lakeshore East (LSE) Corridor are anticipated to be available in Fall 2020 and will be presented at the third round of Public Open Houses. Should you have questions or concerns after reviewing the study results and location of proposed mitigation, Metrolinx would be pleased to provide further clarification or discussion in an effort to address any remaining concerns. The Noise and Vibration Studies being completed as part of the GO Rail Network Electrification EPR Addendum will assess how noise and vibration levels will change from existing operations (2015) to the proposed future operations, and to determine whether mitigation measures may be required. As per the Ministry of Environment, Conservation and Parks (MECP)/GO Transit Protocol for Noise and Vibration Assessment, noise impacts from the future GO Transit rail traffic will be expressed in terms of Adjusted Noise Impact, which is based on the difference between the pre-project and post-project noise levels. Noise increases above 5 dBA trigger the draft GO Transit/MECP Noise and Vibration Protocol to consider noise mitigation. Any proposed mitigation for both sound and vibration effects must meet administrative, operational, economic and technical feasibility criteria. Where all criteria are met, the mitigation solutions (i.e. noise barrier) will be recommended. For the section of Joint Corridor shared with the proposed Ontario Line, noise modelling and mitigation effort is being closely coordinated between project teams.
3	Metrolinx Engage	Electrification Infrastructure -Visual Impacts	The render for the electric poles (on your website) isn't really nice. The poles are not really visually pleasing and look very industrial. They don't really blend in with their surroundings. Could your team please consider making the pole design nicer, so that they blend in better with their surroundings and so they are more pleasing to look at?	Metrolinx is aware the installation of OCS infrastructure will affect the viewshed along the rail corridors, particularly in areas of vegetation/tree clearing. Visual impact mitigation strategies for OCS will be identified and incorporated into the design process. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor. Areas of 'high' visual impact as identified in the EPR and/or EPR Addendum will be reviewed and specific design measures will be incorporated to mitigate visual impacts of OCS.
4	Metrolinx Engage	Project Scope – LSE Corridor	I notice you always favour the north and west. Why is that. Why is there nothing past Oshawa. We have all a vote and pay taxes out here.	More GO service to Bowmanville is part of the Growth Plan for the Greater Golden Horseshoe. Expanded rail service will provide Durham Region with more direct connections to the larger GO Transit network, helping to reduce congestion in the GTHA while connecting people to education and job opportunities. Expanding GO Train service in Durham Region builds upon planning work and service and infrastructure improvements that are already underway through our Regional Transportation Plan.

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
5	Metrolinx Engage	Rolling Stock	Metrolinx's plans for electrification are completely wrong, will take years and cost billions more than necessary. Who can I discuss battery electrification. Save billions using existing tracks, save years in building. The new electric Semi Truck from Tesla has enough power to pull a GoTrain. Quiet. Much cheaper. Cleaner. Charging at night almost free power.	Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network. Electrification of the system and trains have been studied as part of the Transit Project Assessment Process (TPAP) for the GO Expansion program, currently in the procurement phase. The GO Expansion program is a single innovative, fully-integrated contract to run more and better service. The successful proponent team will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion. The contract is in a multi-year procurement process, and currently teams are completing the bids that will close in 2021. Construction will get underway in 2022.
6	Metrolinx Engage	Electrification Infrastructure – LSW Corridor	Hi, can you please let me know what the impacts to Haig blvd will be? Is the previously deenergized hydro one towers going to be part of this project to supply more power to the grid?	Haig Boulevard, which intersects the Lakeshore West Corridor within the City of Mississauga is located outside of the EPR Addendum study area; as such, no further changes are proposed beyond what was identified as part of the 2017 GO Rail Network Electrification TPAP. OCS support structures along electrified corridors will be designed to span at-grade rail crossings such as Haig Blvd. and will not impede existing traffic movement. No additional barriers are required/proposed at this crossing as a result of electrification. Currently, there are no plans to utilize the transmission towers near Haig Boulevard as part of the infrastructure required for the Go Rail Network Electrification Project. Power to electrify the network, including the Lakeshore West Rail Corridor will be drawn from existing Hydro One transformer stations as described in the 2017 EPR, Volume 1.
7	Metrolinx Engage	Vegetation Removals – LSE Corridor	When will the planned vegetation removal be occurring along LSE from Eastern Ave to Coxwell section?	Metrolinx will work with its contractor to finalize the removals schedule once the contract for the Vegetation Removal and Compensation Program is awarded late this year. Work will be phased throughout the GO rail network over the course of a couple of years. If you haven't done so already, kindly subscribe to our regional Toronto East e-newsletter here. We will be using it to advise communities prior to any removal work starting and we also regularly share updates on all other exciting projects happening in the area.
8	Metrolinx Engage	Construction – noise complaints	Will Metrolinx install a 24 hour hotline for construction complaints?	Prior to the commencement of construction, the Contractor will be required to develop and submit a detailed Construction Noise Management Plan to Metrolinx. When possible, construction will be limited to the time periods allowed by the locally applicable bylaws (generally during the daytime hours and during weekdays). Certain types of construction work can only be completed when trains are not in service (i.e., outside of business hours). Although provincial agencies such as Metrolinx and Hydro One are not subject to municipal bylaws, Metrolinx (and it's Contractor) will endeavour to adhere to these local bylaws as a best practice, where practical. A Communications and Complaints Protocol will be developed by the Contractor, which will indicate how and when surrounding local businesses and property owners/tenants will be informed of anticipated upcoming construction works (including work at night) and who they can contact should they have any concerns. This will include a response strategy to address/resolve potential noise/vibration complaints during the construction phase.
9	Metrolinx Engage	Construction - management	Will they have high-level managers onsite during construction to oversee the enforcement of the guidelines? What will happen if contractors do not follow those guidelines and significant community complaints are being made?	As documented in the 2017 GO Rail Network Electrification Environmental Project Report (EPR), an Environmental Management System (EMS) will be established and implemented to ensure that environmental protection/mitigation measures identified through the GO Rail Network Electrification TPAP are fulfilled and functioning as expected. The EMS will also include any additional commitments and mitigation measures identified as part of this EPR Addendum. The overall intent of the EMS will be to integrate environmental management into the daily operations and other quality management systems of the project throughout the detail design and construction phases of the project. Construction activities, compliance and any identified complaints will be closely monitored by Metrolinx representatives to ensure that construction activities are conducted in accordance with project requirements and associated mitigation/monitoring plans.
10	Metrolinx Engage	Construction - management	How will Metrolinx ensure our communities who live along the LSE have a voice in staging areas and construction timings?	Additional communications will be undertaken during the detailed design and construction phases of the project to ensure that local businesses and adjacent properties owners/tenants are provided with updated information regarding construction activities and timelines within their respective neighborhoods. Detailed design will begin in 2021 and construction for the OnCorr Program is expected to occur from 2022 to 2028. Metrolinx has also developed an Information Sheet on Construction Management that was prepared as part of the consultation materials presented in Round 1 (held February 2020). Please see the link below for further information: https://www.metrolinxengage.com/sites/default/files/info_sheet_6_-_construction_mgmt_-_final2.pdf. Please see the link below to a recent Metrolinx blog post for information on how construction will be managed in Ontario communities: https://blog.metrolinx.com/2020/03/25/getting-past-dirt-and-dust-during-critical-transit-development-how-metrolinx-will-tackle-future-go-expansion-projects-in-your-neighbourhood/

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
11	Metrolinx Engage	Construction - management	Where in your Construction Management Plan does it say that Metrolinx will consult with the community the are working in? Will there be any consultation prior to construction, that will involve all community homeowners and stakeholders, allowing them input into the Construction plans for their area?	Additional communications will be undertaken during the detail design and construction phases of the project to ensure that local businesses and adjacent properties owners/tenants are provided with updated information regarding construction activities and timelines within their respective neighborhoods. Specifically, a Communications and Complaints Protocol will be developed by the Contractor, which will indicate how and when surrounding local businesses and property owners/tenants will be informed of anticipated upcoming construction works. In addition, prior to the commencement of construction, the Contractor will also be required to develop and submit a detailed Construction Noise Management Plan to Metrolinx. Detailed design will begin in 2021 and construction for the OnCorr Program is expected to occur from 2022 to 2028. Metrolinx has also developed an Information Sheet on Construction Management that was prepared as part of the consultation materials presented in Round 1 (held February 2020). Please see the link below for further information: https://www.metrolinxengage.com/sites/default/files/info_sheet_6_-_construction_mgmt_-_final2.pdf.
12	Metrolinx Engage	Construction / Implementation Timelines	Currently the electrification of GO is scheduled to be complete by 2025, with construction starting this year. The June 2020 Market update by Infrastructure Ontario showed that the GO Oncorridor (expansion) contract (which includes electrification) is only scheduled to be awarded in 2022 - yet again delayed. Is electrification still scheduled to start this year? What is causing the delay in the procurement of various contracts GO RER expansion contracts? And is the electrification of GO still scheduled to be complete by 2025?	Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network. Electrification of the system and trains have been studied as part of the Transit Project Assessment Process (TPAP) for the GO Expansion program, currently in the procurement phase. The GO Expansion program is a single innovative, fully-integrated contract to run more and better service. The successful proponent team will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion. The contract is in a multi-year procurement process, and currently teams are completing the bids that will close in 2021. Construction will get underway in 2022, and a proposed schedule for completion will be available at that time.
13	Metrolinx Engage	Rolling Stock	Hi! In one of your responses, you said that the Barrie Line would use the following technologies: - 1 Diesel Locomotive with 6 Cars, which will comprise approximately 4% of trips; - 1 Electric Locomotive with 6 Cars, which will comprise approximately 84% of trips; and - 2 Electric Locomotives with 12 Cars, which will comprise approximately 12% of trips. According to the Go Expansion Business Case, the plan was to solely rely on EMUs and Electric Locomotives. Why did Metrolinx decide to not use EMUs and why won't diesel be fully phased out?	Thank you for your questions and interest in the GO Rail Network Electrification Addendum. The 2018 GO Expansion Business Case indicated that electrified service would be provided by a combination of Electric Multiple Units (EMUs) and electric locomotives. Metrolinx has continued to review the fleet strategy to determine the type(s) of vehicles we will procure. The fleet strategy review is still on-going at this time. For the purposes of assessing noise and vibration related impacts along the Barrie Corridor a future Train Service Scenario was established, representative of the predictable worst-case scenario. Since electric locomotives are louder than EMUs, they were used to capture the range of actual scenarios that may be implemented in the future to deliver the required service levels. This does not preclude the usage of EMUs over electric locomotives on the Barrie corridor in the future. With respect to your question about why diesel service will not be fully phased out, Metrolinx is electrifying GO-owned rail corridors. Service on rail corridors not currently owned by Metrolinx will continue using diesel trains. As such, Metrolinx will maintain a mixed electric and diesel fleet. As part of the predictable worst-case scenario it was assumed that diesel locomotives would be used on 4% of trips along the Barrie Corridor to service any peak period increases above predicted volumes.
14	Metrolinx Engage	Operations – Train Service	Would this result in all day train service?	Until the advent of COVID-19, we had more frequent GO service on the Barrie corridor than ever before, including all-day service on core segments of the line. In 2019, we added more weekend service to Barrie as well. Starting Sept. 5, as the province moves through Stage 3 of pandemic recovery, Metrolinx will be resuming most train service to provide service every hour, with more service during rush hours, and hourly throughout most of the day in the midday, evenings and on weekends. As part of the On Corridor program, the goal is to provide all-day, electrified GO service to Allandale GO Station, and to allow for more travel choices for our customers.
15	Metrolinx Engage	Operations - Fares	When are fares going to cover the actual cost of each ride? As a taxpayer who has not used transit in 50+ years I'm tired of paying anything that needs a subsidy to survive is a failure	Metrolinx is transforming its approach to be more commercial and to act more like a business. We are focused on its goals of increasing service and generating revenue while being cost efficient and reducing the reliance on the provincial operating subsidy. You can find more information and details in the 2019-20 Metrolinx Business Plan here on Metrolinx.com. We continue to look at more transformation initiatives to lower expense and increase revenue.
16	Metrolinx Engage	Rolling Stock	What will be make of the Electric motive power and numbers of engines for the Barrie Corridor?	Thank you for your questions and interest in the GO Rail Network Electrification Addendum. We are currently reviewing the fleet strategy to determine the type(s) of vehicles we will procure. This work is looking at vehicle types from self-propelled electric multiple units (EMUs) to electric locomotives to a combination of both. The fleet strategy review is still on-going at this time. In accordance with the proposed future Train Service Scenario, the following train consists (including revenue and non-revenue movements) are anticipated on the Barrie Corridor post-electrification:

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
				1 Diesel Locomotive with 6 Cars, which will comprise approximately 4% of trips; 1 Electric Locomotive with 6 Cars, which will comprise approximately 84% of trips; and 2 Electric Locomotives with 12 Cars, which will comprise approximately 12% of trips. Metrolinx is currently undertaking system-wide Noise and Vibration and Air Quality Studies associated with increased service levels. Further information, including results of these studies and proposed mitigation are anticipated to be available in the fall of 2020.
17	Metrolinx Engage	Implementation Timelines	What is the earliest date for the two track electrified Barrie line to be operating?	The GO Rail Network Electrification EPR Addendum is anticipated to be complete Spring 2021. GO Expansion is part of a system wide project to design, build, operate and maintain the network, currently in the procurement phase. The winning proponent will propose and procure trains that meet the requirements to deliver future service levels on the GO Transit rail network. Once a proponent is selected there will be further information in terms of construction scheduling and sequencing. Updates will be provided to the public and stakeholders prior to construction.
18	Metrolinx Engage	EA Process - Consultation	How is it that on a page entitled Provide feedback, there is only information on reading more reports and no place to provide feedback (other than ask questions)?	Thanks for your comment. To ensure we accurately address your concern please provide the webpage URL in reference, here. We will review and get back to you asap. Please also feel free to provide the feedback you had hoped to share initially through this same contact page.
19	Metrolinx Engage	GO Stations	Also regarding the Barrie Line, would the Innisfil Transit Hub & TOD be built as part of the station upgrades program? Could you provide an update on the Maple Station rebuild?	Metrolinx acknowledges that the Town of Innisfil is moving forward their Orbit vision for a proposed Transit Oriented Community. In 2016, Metrolinx completed an Initial Business Case (IBC) and further completed a Preliminary Design Business Case (PDBC) in 2018 which examined the benefits of a potential Innisfil GO Station on the Barrie GO rail corridor within the Town of Innisfil at 6th Line, just east of 20th Sideroad. In April 2019, Metrolinx adopted the Transit Oriented Communities Program to implement transit infrastructure that leverages the value of Metrolinx's transit network, service and real estate portfolio. This program involves the partnership between Metrolinx and a third party to deliver new or improved transit infrastructure wherein third parties will fund the design and construction of infrastructure and Metrolinx will operate it. In response, the Town of Innisfil prepared and endorsed the Orbit plan, which is centered around a proposed GO station along the Barrie rail corridor. The proposed GO station which is subject to further approvals and agreements would be delivered by a third party partner and not as part of the station upgrades program. As an update regarding the Maple GO Station, the tender for Maple GO Station Improvements is expected to be issued in Winter 2020. Contract award will be completed in Spring 2021 with construction beginning Summer 2021.
20	Metrolinx Engage	Electrification Infrastructure – RH Corridor	Finally, I was wondering if the Richmond Hill Line will be electrified. I know that there have been studies, but the Business Case states that it'll still use diesel trains.	A portion of the Richmond Hill corridor will be electrified between the Union Station Rail Corridor (USRC) and Pottery Road to allow for efficient movement of trains in and out of the USRC. The assessment of electrification infrastructure is currently being assessed as part of the New Track & Facilities TPAP. More information about the project can be found here: https://www.metrolinxengage.com/en/newtrackfacilities You are correct that train passenger service along the Richmond Hill Corridor will continue to use diesel locomotive trains.
21	Email	Rolling Stock	Will any electrified trains run on the Union Station Rail Corridor (USRC)? If so, roughly what percentage of USRC rail traffic would be electric and what percentage would be diesel? Does Metrolinx own the USRC? That is, will diesel trains continue to run on the USRC? If so, would this be indefinite? Would these diesel trains on the USRC be switched to electric at any point (for example, when the current diesel stock needs replacing), and if so, roughly how long would that take?	Yes, the Union Station Rail Corridor (USRC) will be electrified as described in the 2017 GO Rail Network Electrification Environmental Project Report (EPR). A copy of the EPR and associated technical studies is available here: http://www.metrolinx.com/en/electrification/electric.aspx As part of the plan to electrify the GO Rail Network, some corridors will provide a mix of both diesel and electric train service, while others will be fully electrified. The USRC is the hub of the GO Rail Network, with Union Station serving as the termination point for all rail corridors. As such, the corridor will have a mix of diesel and electric train service. In accordance with the proposed future Train Service Schedule scenario, approximately 48% of the daily trips (including revenue and non-revenue movements) on the corridor will be diesel trains. Metrolinx is currently undertaking system-wide Noise and Vibration and Air Quality Studies associated with increased service levels. Further information, including results of these studies and proposed mitigation are anticipated to be available in the fall of 2020. Metrolinx does own the USRC; however, other rail services such as VIA Rail and CN freight switcher trains are also in operation along the corridor as well. We are currently proposing to electrify Metrolinx-owned portions of the GO Rail Network. Further discussions and

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
				agreements with freight providers (i.e. CN and CP) are required for the remaining portions of the network in order for the system to become fully electrified. Therefore, as long as some portions of the network maintain diesel service, the USRC will as well. However, as corridors within the GO Rail Network become electrified, fewer trips will be made with diesel trains.
22	Email	Rolling Stock	If Metrolinx decides to go with a hydrail solution, would the hydrail trains run on the USRC? Would this be instead of electric trains that need overhead wires?	Regarding your questions about Hydrail, Metrolinx has been investigating the feasibility of using a Hydrail system for one of the largest and most complex rail upgrades in the world. Recent advances in the use of hydrogen fuel cells (HFC) to power trains in other jurisdictions make it important that Metrolinx considers this clean technology. The Minister of Transportation announced in June 2017 that Metrolinx would be undertaking a feasibility study. Since then, we have completed the study report and it is now available. Metrolinx also hosted an international symposium in November 2017 and made progress on both the HFC Electric Multiple Unit (EMU) concept design and the HFC locomotive concept design and prototype project. While the Hydrail projects progress and we continue to investigate which technology will be the right solution for the GO rail network, we are still very much focused on delivering faster and cleaner electrified services. For the purposes of this Transit Project Assessment Process (TPAP) Addendum, only an overhead catenary system is being examined. Metrolinx will continue to monitor the developments of advances in new rail propulsion technology as they become more viable systems in the future. For further information regarding hydrail and the associated feasibility study undertaken, please visit:
23	Email	Electrification Infrastructure - TPFs	What is the exact location of the Station and What is the definition of Switching Station, what does a switching Station look like/entail?	As part of the 2017 GO Rail Network Electrification Transit Project Assessment Process (TPAP), a Switching Station (SWS) was approved at 590 Steven Court in the Town of Newmarket. The location and conceptual layout of the Newmarket SWS is shown on the figure provided as an attachment to this email. A SWS is a traction power facility that is located approximately mid-way between Traction Power Substations (TPS) in order to segregate power flow on the network. SWS equipment will generally include two autotransformers and medium voltage switchgear for connections to the Overhead Contact System (OCS). A photo of a Switching Station has been provided below for your information. Potential effects associated with the installation/operation of the approved traction power facilities (including the Newmarket SWS) were assessed in detail as part of the 2017 GO Rail Network Electrification TPAP. The Environmental Project Report (EPR) and supporting technical studies are available for review at http://www.metrolinx.com/en/electrification/electric.aspx. During detailed design, efforts will be made to minimize visual effects of the SWS infrastructure as much as possible by implementing landscaping and/or screening around the facility. There are no changes to the proposed Newmarket SWS as part of the EPR Addendum from what was shown in the 2017 EPR.

5.3.3 GO Expansion Public Information Centre Round #3

Metrolinx hosted the third round of public consultation for the GO Expansion Program online from November 27 to December 11, 2020. In the third round of consultation, Metrolinx presented available draft environmental and technical study findings and provided updates on outstanding study results for the three (3) TPAPs (New Track and Facilities TPAP, Scarborough Junction Grade Separation TPAP, Stouffville Rail Corridor Grade Separations TPAP) and the two (2) addenda projects (the Network-Wide Structures Project [an Addendum to the Barrie Rail Corridor Expansion TPAP 2017], and the Addendum to the GO Rail Network Electrification TPAP 2017); sought public feedback on the proposed mitigation measures, recommendations, and other advice for implementation for each of the projects; and introduced the Union Station Trainshed – Heritage Conservation project.

A key piece of new information in Round Three included the operational air quality and noise and vibration impacts and proposed mitigation measures that are being undertaken as part of the Addendum to the GO Rail Network Electrification TPAP 2017, which covers new infrastructure across all projects in the GO Expansion Program. Information related to the USRC Hydro One Conflicts assessment was also introduced as part of this round of consultation. **Figure 5-2** shows a screenshot of the Metrolinx Engage GO Rail Network Electrification Addendum page during PIC #3.

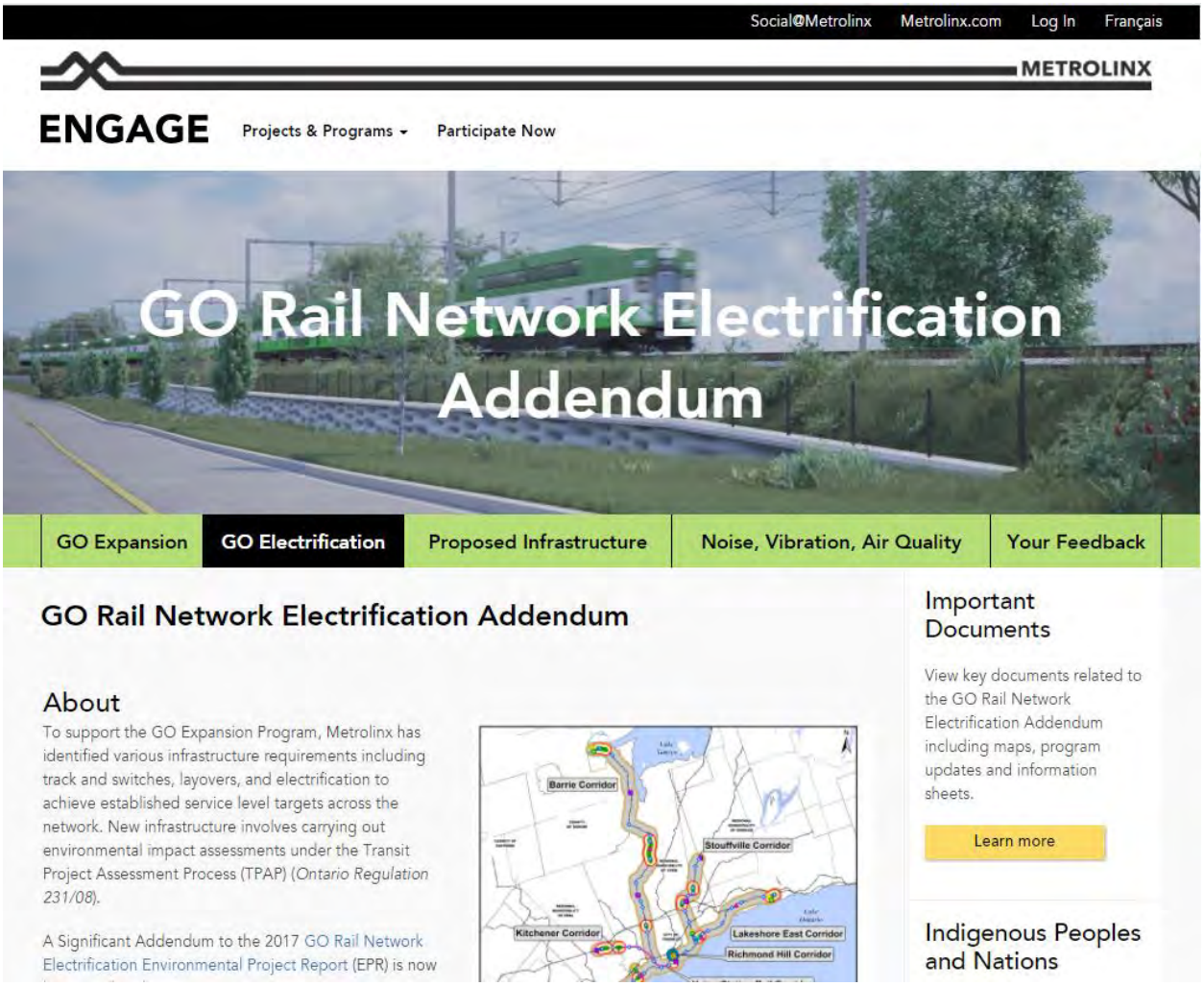

FIGURE 5-2: METROLINX ENGAGE GO RAIL NETWORK ELECTRIFICATION PAGE FOR PIC #3

As with the previous Public Meetings, a summary report was produced that outlined how stakeholders were engaged prior to and during meetings, how and what content was presented, meeting attendance, and the types of feedback that were received. The information panels available online for review covered the following topics:

- New Track and Facilities TPAP – Proposed Walkers Line Layover Facility
- Effects and Proposed Mitigation Measures - Proposed Walkers Line Layover Facility
- New Track and Facilities TPAP – Proposed Don Valley Layover Facility
- Effects and Proposed Mitigation Measures - Proposed Don Valley Layover Facility
- Scarborough Junction Grade Separation Project – Midland Layover Facility Potential Effects and Proposed Mitigation Measures
- Scarborough Junction Grade Separation Project – Corvette Park Multi-use Crossing
- Scarborough Junction Grade Separation Project – Utilities
- Stouffville Rail Corridor Grade Separations Project – Construction Sequencing Considerations
- Stouffville Rail Corridor Grade Separations Project – Study Results

- Stouffville Rail Corridor Grade Separations Project – Progress Avenue Road Over Rail
- GO Rail Network Electrification Addendum – Air Quality Assessment Update
- GO Rail Network Electrification Addendum – USRC Hydro One Conflict Areas
- GO Rail Network Electrification Addendum – Study Highlights
- GO Rail Network Electrification Addendum – Electrification of Proposed Midland Layover
- GO Rail Network Electrification Addendum – Noise and Vibration Assessment Update
- Network Wide Structures Project – McNaughton Road Grade Separation
- Network Wide Structures Project – McNaughton Road Grade Separation Study Highlights
- Union Station Trainshed – Heritage Conservation

5.3.3.1 Notice of Public Meeting

Metrolinx posted a Notice of Public Meeting to inform stakeholders of the opportunity to participate in the Round 3 public meetings. This notice was posted on Facebook, Instagram, LinkedIn and Twitter, as well as on Metrolinx-owned webpages such as Metrolinx News and the GOExpansion webpage.

Additional notification (apart from the notice distributed to those on the Stakeholder Contact List) included the circulation of a Metrolinx Regional Newsletter from December 1, 2020 to December 7, 2020 to interested parties who had signed up to receive Metrolinx news and the distribution of email notifications to participants from Public Information Centre Rounds 1 and 2.

These notices are included in **Appendix M2, Appendix M3, Appendix M8, and Appendix M11.**

5.3.3.2 Public Meetings Overview and Locations

As with the Round 2 consultation efforts, all consultation activities were hosted on the Metrolinx Engage website as part of the Virtual Open House. The GO Expansion Program and its project-specific webpages were organized to clearly present information and seek feedback. The information on the webpages included a combination of Round One, Round Two and Round Three content and materials.

The Electrification page included a page describing the project, a page including links to the associated project studies, a page containing links to important documents (such as the Virtual Open House materials), and a page for the public to provide feedback on the project. A series of panels providing “Study Highlights” served to provide an update on the studies completed to date, including revised information from the key preliminary design and construction commitments provided in previous rounds.

As part of Round 3, an additional page was added to present information about the future service levels and requirement for reassessments, key findings, methods, potential impacts, and proposed mitigation from the System-Wide Operational Noise & Vibration and Air Quality Assessments that cover all of the GO Expansion Programs. A series of panels were included to provide information on the air quality assessments and noise and vibration studies completed, including the new Enhanced Noise Mitigation Assessment completed.

Additional information added to the scope of the EPR Addendum since the completion of the second consultation round included the electrification of the Midland Layover and the USRC Hydro One Conflict Area assessment. For the electrification of the Midland Layover, informational panels were provided with details on the additional studies required to assess the impacts of the OCS infrastructure to be included as part of the layover. For Hydro One Conflict

Areas, a summary of the identified conflict areas, proposed mitigation measures, and cultural heritage studies were presented in a set of linked informational panels. The Hydro One Conflict Areas are located in the vicinity of the USRC and surrounding areas from approximately Mile 0.72E (just east of Henry Lane Terrace) to Mile 1.72E (just west of the Don River Valley), and further information is included in Sections 3.2.3 and 4.2.3.

It is noted that the Enhanced Noise Mitigation Assessment was undertaken as a separate and complementary study to the GO Rail Network Electrification Addendum noise and vibration studies, to examine the potential for additional mitigation along the rail corridors in locations where mitigation was not triggered under the requirements of the Environmental Assessment (EA). The intention is for Metrolinx to consider further noise barriers to protect receptors where absolute noise levels were predicted to be relatively high due to existing rail traffic levels, even if the increase in noise impacts did not meet the (5 dB) threshold for increased noise impacts identified in the updated noise and vibration assessment studies.

As part of the Round 3 consultation activities, the results of this assessment were presented alongside the results of the other noise and vibration assessments so that comments could be solicited on all potential mitigation measures currently proposed. However, the additional noise walls recommended as part of the Enhanced Noise Mitigation Assessment are beyond the scope of this EPR Addendum, and as such are not captioned within this document or supporting studies and materials.

5.3.3.3 Roll Plans

The roll plans from PIC #2 were updated to show the changes to the proposed Walkers Line Layover, along with the addition of the Midland Layover OCS Impact/Vegetation Removal Zone. In addition, the roll plans were updated to show noise and vibration mitigation features along the corridors. This information included the location of representative receptors, noise mitigation barriers (including barriers approved under different projects, barriers meeting the feasibility criteria as part of the EPR Addendum, and barriers meeting the feasibility criteria within the Enhanced Noise Mitigation Assessment), and proposed vibration mitigation for tracks and switches. The maps also featured the Traction Power Facility (TPF) sites and ancillary components (including feeder routes) approved as part of the 2017 TPAP, as well as new areas of impact being assessed as part of the EPR Addendum.

A new interactive mapping tool was also provided on Metrolinx Engage, which included the same information that was included in the roll plans along with information relevant to the other GO Expansion TPAPs.

5.3.3.4 Summary of Attendance and Public Comments Received

As the Virtual Open House format for PIC #3 required that all participants use Metrolinx Engage to view materials, the majority of comments were received through Metrolinx Engage. While comment forms were used as part of this round of consultation, interested parties were still permitted to provide feedback through emails, letters, and phonecalls. The EPR Addendum webpage received approximately 2,760 page views by 870 users.

Approximately thirty-two (32) questions and comments related to the EPR Addendum scope were received through the Ask-a-Question page, Feedback Forms, and the regional email account. Of these, five (5) Feedback Forms were submitted and one (1) email was received. A summary of the general question and comment topics submitted on Metrolinx Engage are as follows:

- **Interest in anticipated timelines and construction schedules**. Some participants were interested to learn about the anticipated timeline for electric train service, associated timelines for the construction of electrification infrastructure, and the sequence for electrification between the GO Rail corridors. There was also a question about whether UP Express will be electrified too.
- **Coordinate electrification infrastructure for both GO and Ontario Line.** A few participants suggested coordinating the construction of infrastructure for both of these services on the Lakeshore East Corridor (where they share the corridor) at the same time to minimize construction impacts to the community (e.g. avoid two periods of construction).
- **Weather-proof OCS infrastructure.** A few questions asked about Metrolinx's solutions for de-icing and weather-proofing OCS; and the service plan for inclement weather for electric train service.
- **Future train technology.** Some participants wanted to know about Metrolinx's future fleet, and whether the plan is to only replace diesel locomotives with electric ones or whether electric multiple units and/or hydrogen trains would be considered. There were also a few questions about how service works in a mixed diesel/electric corridor (i.e. would passengers have to transfer trains in order to continue on their journey).
- **Hydrogen trains.** Some participants were interested in learning about any plans for using hydrogen trains for GO Expansion. There were a few comments that said they prefer hydrogen over electrification because there is no need for OCS and hydrogen trains would emit water (instead of emissions related to electricity generation and diesel); some European countries have started to use hydrogen for rail and road transportation; and infrastructure should accommodate potential hydrogen trains in the future.
- **Future service to Aldershot GO.** A few participants wanted to know if there would be 15-minute electrified service to Aldershot GO in GO Expansion and said it is important to consider frequent service to this area because it is a planned mobility hub/major transit station area with high-density development that would use and benefit from this service.
- **Mixing express and local train service.** A participant wanted to know how express and local trains operate in a rail corridor (along the Stouffville Line, for example) with two tracks while maintaining the frequency of 15-minutes or better with no bypass track.
- **Concerns about noise and vibration impacts**. Several participants shared concerns about noise and vibration impacts as a result of current and future service increases (such as in Agincourt, Riverdale, East York, and other segments along the rail network). Some participants asked what is being done today to mitigate noise and vibration impacts from recent service increases being felt by community members.
- **Interest in Metrolinx's construction noise and vibration standards.** Some participants shared concerns about future construction noise and vibration impacts and wanted more details about Metrolinx's approach to construction noise and vibration mitigation standards. A few participants shared concerns about vibration impacts that might damage properties near the rail corridor.
- **Interest in the recommended additional noise walls beyond the Provincial Protocol.** Several participants were interested in learning more about the additional noise walls that Metrolinx is considering beyond the regulatory requirements of the TPAP and shared support for those additional noise walls. Some participants asked if there will be any additional noise walls considered in Liberty Village, CityPlace, Union Station, and Corktown. A few participants also inquired if it is possible to mitigate and prevent sound from travelling upwards (affecting high rises) and when people could

expect additional noise walls to be built. There was also a suggestion to implement noise walls and ballast mats to the entire GO Rail network.

- **Consider transparent noise walls**. There was a suggestion to install transparent noise walls where streetlights run along the rail corridor.
- **Some said that it is good that Metrolinx is moving to cleaner trains in the future**. A few participants asked how Metrolinx is improving the impacts of older diesel trains. There was also some interest in learning more about the greenhouse gas emissions from electricity generation, and what form of electricity generation the future train service will draw from.
- **Interest to learn more about the Vegetation Guideline and its alignment with other policies**. Some participants shared their concerns about vegetation removals and asked how Metrolinx's approach to vegetation removals and compensation align with policies with the City of Toronto and the Toronto and Region Conservation Authority (TRCA). Others suggested that it is important to ensure that crews that work on vegetation clearance in the corridors are protecting older trees and wildlife habitats; and that vegetation compensation is being carried out.

Table 5-6 summarizes the key issues/comments/questions related to the GO Rail Network Electrification EPR Addendum that were received from the public as part of the Round 3 public consultation, and how they were considered by Metrolinx. Copies of emails and their respective responses, along with the posts made on Metrolinx Engage, are included in **Appendix M7,** and the complete Public Meeting #3 Summary Report can be found in **Appendix M6.**

TABLE 5-6: SUMMARY OF PUBLIC CONSULTATION ROUND 3 PUBLIC COMMENTS RECEIVED (NOVEMBER 2020 – DECEMBER 2020)

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
1	Metrolinx Engage (Ask a Question)	Construction and Facility Siting – Communication	Studies studies studies. There certainly has been a lot of studies. The last TPAP box is headed "2021 and Beyond" and lists design and construction which frankly is very vague. Design could take years and electrification will not happen on all routes at the same time. Its possible that electrification could be 10-20 more years away depending on what line one is talking about. And what about the study of hydrogen? Would that impact implementation? So there is a lot of talk about electrification but no credible dates for actual shovels in the ground building it. On what date will a shovel go in the ground, and where, to start construction of electrification of the GO system?	The Significant Addendum to the 2017 GO Rail Network Electrification Environmental Project Report (EPR) is now being undertaken and is anticipated to be complete Spring 2021, with detailed design to start later in 2021. The construction timeline start is currently estimated for 2022, with construction being phased across the GO rail network. The GO Expansion program is a system wide project to design, build, operate and maintain the network, currently in the procurement phase. Once a proponent is selected there will be further information in terms of construction scheduling and sequencing. Updates will be provided to the public and stakeholders prior to construction. Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network. That's why, in addition to studying the environmental impacts of traditional electrification, Metrolinx has also studied the feasibility of hydrogen powered vehicles. The successful proponent team will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion, including the technology for electrification. As part of the tender process, bidders will be able to propose both hydrail and overhead wire technology to electrify the GO network. The benefit of this approach is it allows one single party to manage all the interrelated decisions necessary and oversee each phase of the process from design to maintenance.
2	Metrolinx Engage (Ask a Question)	Impact Assessment - Noise and Vibration	green 'additional' noise walls I see from the map that additional noise walls will be built in my area around Wildwood Road and Williamson Park Ravine area, when are they slated to be built?	Yes, you are correct that additional noise walls have been proposed in proximity to the referenced location along the Lakeshore East corridor as a mitigation measure that goes above and beyond the Ontario Provincial protocol to ensure noise walls are recommended in communities that are already experiencing high background noise. The supporting Draft Noise and Vibration Study for the Lakeshore East Corridor is available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-important- documents-0 The Significant Addendum to the 2017 GO Rail Network Electrification Environmental Project Report (EPR) is now being undertaken and is anticipated to be complete Spring 2021, with detailed design to start later in 2021. The construction timeline start is currently estimated for 2022, with construction being phased across the GO Rail Network. GO Expansion is part of a system wide project to design, build, operate and maintain the network, currently in the procurement phase. Once a proponent is selected there will be further information in terms of construction scheduling and sequencing. Updates will be provided to the public and stakeholders prior to construction.
3	Metrolinx Engage (Ask a Question)	UP Express	UP Express Is the UP Express still on track to become part of the GO rail network? If so, once the line uses EMU's, a service concept can be Pearson-Unionville. That way, with fare integration and higher frequencies, that will drive up ridership for the line	Metrolinx is continuing to make transit more accessible and affordable in the region. In 2014, Metrolinx completed an environmental assessment to electrify the UP Express service from Union Station to Pearson International Airport. The GO Rail Network Electrification TPAP (completed in 2017) picked up where the previous study left off by assessing segments of other Metrolinx-owned rail corridors. Under the current GO Expansion Program, Metrolinx is actively procuring a single contractor to design, build, operate and maintain the GO Transit Rail Network. The service plan will be determined by the successful contractor responding to service level, maximum journey times and frequency requirements predetermined by Metrolinx. The service will transform rail travel throughout the Greater Toronto and Hamilton Region moving from an essentially commuter based service to a two-way-all day service operating at a minimum of 15 minute frequencies over the core segments, meaning nearly all connecting times will be reduced The method of scheduling, including the use of schedule symmetry or otherwise, will be determined by the successful proponent who is incentivised to provide the best overall offering of service to give maximum economic benefit in accordance with the GO Expansion Business Case (which can be found here), the Business Case assessment includes factors relating generalized journey times which includes transfer time.

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
4	Metrolinx Engage (Feedback Form)	Impact Assessment - Noise and Vibration	1. What do you like about GO Expansion? 2. Are there any specific features, sensitive locations and areas of interest that were not identified in the 2017 Electrification TPAP, that you feel should be addressed in this Electrification EPR Addendum? Noise barriers and vibration mitigation all long the track and not just in specific area. 3. For noise and vibration, are there any sensitive areas, neighbourhoods or locations that you feel have not been identified or sufficiently addressed in the assessments? The area between Coxwell and Woodbine. 4. Do you have any questions about the one-time only Enhanced Noise Mitigation Program being offered? Why isn`t a noise mitigation program being offered all along the track? 5. For air quality, are there any sensitive areas, neighborhoods or locations that you feel have not been identified or sufficiently addressed in the assessments? What is being done now to address the air quality of the trains. The older trains are heavy polluters. It is great to plan for the future but what are the plans to remove the older trains. 6. Are there any mitigation measures for construction, operation and maintenance of the electrified GO rail network that you feel are missing? If so, do you have any suggestions for the Project Team? Garbage removal and tree planting along the tracks. 7. Are there any concerns or other impacts associated with electrification that you'd like us to consider? 8. Any other comments or advice you'd like to share with the team? The crew that is working on the tracks is clear cutting the trees. No consideration for the animal life or the people on or off the trains that appreciate the vegetation that lines the tracks. There are no protection zones being place around the older (100 year plus trees) along the tracks many which are on the property lines between Metrolinx and private home owners. The heavy machines working along the tracks are damaging these older trees.	As part of the GO Rail Network Electrification Addendum, updated noise and vibration studies have been undertaken to assess potential impacts associated with Metrolinx's new detailed service plan. The new noise and vibration studies being undertaken for the upcoming Electrification EPR Addendum supersede the previous 2017 studies. With respect to assessing potential impacts associated with noise and vibration and to determine when mitigation is warranted, Metrolinx follows a specific Ontario Provincial Protocol (Ministry of Environment, Conservation and Parks (MECP)/GO Transit Protocol for Noise and Vibration Assessment), regardless of existing noise barriers or proximity to a GO Station. Noise receptors along the rail corridor were considered as part of the updated assessments. Under the Ontario Provincial Protocol, mitigation is considered under the following conditions: Noise: Where post-project noise exposure levels are expected to exceed, by at least 5 dBA, corresponding pre-project levels or MECP objectives (55 dBA for daytime and 50 dBA for nighttime) – whichever are greater. Vibration: Where pre-project vibration exposure is expected to exceed its pre-project level or the MECP objective (0.14mm/s) by at least 25% - whichever is greater. More detailed information regarding the Noise and Vibration Assessment Update presented as part of PIC #3, including further clarification regarding assessment methodology and mitigation is available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-noise-vibration-and-air-quality-studies The segment of the Lakeshore East corridor between Coxwell and Woodbine was considered as part of the updated assessment. The supporting Draft Noise and Vibration Study for the Lakeshore East Corridor is available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-important-documents-0 Additional noise walls have been proposed in proximity to the referenced location along the Lakeshore East corridor as a mitigation measure that goes above and beyond the Ontario Provincial protocol to ensure noise walls are recommended in communities that are already experiencing high background noise. An Interactive Map and Roll Plans showing the location of recommended noise and vibration mitigation has been presented as part of PIC #3 and can be viewed at the following link: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-noise-vibration-and-air-quality-studies As noted in response to Comment #1, mitigation is considered under specific conditions in accordance with the Ontario Provincial Protocol. In addition to the new detailed service plan, four significant enhancements have been integrated into the 2021 noise and vibration assessment update: • Source-based noise mitigation measures, which are the most effective noise reduction measures and it reduces sound levels for all properties along Metrolinx rail corridors. • Fair distribution of proposed mitigation measures to maximize benefits. • Technical constructability, which is usually applied at a later design stage. • A maximum 7-metre noise barrier height could be considered where a 5-metre barrier height will not achieve the required noise reduction. The most effective form of mitigation is reducing or eliminating the sound at the source. Not only is source mitigation most effective, but it reduces sound levels for all properties along Metrolinx rail corridors. Metrolinx will implement a number of source mitigation measures across the network, including: • Installing exhaust noise silencers on existing and future Metrolinx diesel locomotives, which will decrease the sound from these trains by an estimated 3 dB at all properties along the corridors. • Where possible, using 6-car rather than 12-car trains during off-peak periods. • Using EMUs along the Stouffville and Kitchener corridors. • Reducing engine idling. • Improvements to tracks and switches to reduce vibration and noise. • Installation of ballast mats underneath new tracks and switches to reduce vibration. The largest reduction of potential noise increases will come from electrification on core segments of the network. The bulk of service increases will be delivered by electric trains, which are near silent at low speeds, starting or stopping, and when stopped. Metrolinx is committed to implementing electric rail service and improving air quality impacts from its trains. As part of the GO Rail Network Electrification Addendum, updated air quality studies have been undertaken to assess the potential impacts associated with Metrolinx's new detailed service plan. This study examines how emissions from Greenhouse Gases (GHGs) and other contaminants

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				may change during the shift from existing operations to proposed future operations on a network-wide scale within the GO Expansion program area. Metrolinx is committed to reducing local air pollution emissions by implementing the following measures: • Electrify the system to the maximum extent possible • Make future diesel engine purchases and rebuilds compliant with the Tier 4 exhaust emission standards • Reduce idling with technical and operational means • Store only electric trains at the Bathurst and Wilson Yard Layovers, eliminating diesel engine idling and related emissions • Idling will also be reduced through the implementation of technical and operational changes. A summary of the key findings of the Air Quality Assessment Update can be viewed here: https://www.metrolinxengage.com/sites/default/files/goelectrification_air_quality_study.pdf The supporting Draft Air Quality Assessment studies are available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-important-documents-0 Corridor maintenance, such as garbage removal is managed by Metrolinx and is outside the scope of the GO Rail Network Electrification Addendum. It is acknowledged that there will be visual effects of varying degrees due to the implementation of an Overhead Contact System (OCS), i.e. poles, wires along the rail corridors. Visual impacts were assessed as part of the 2017 GO Rail Network Electrification TPAP and documented in the Visual Impact Assessment Report (Appendix H2 of the EPR). Visual impacts associated with additional electrification infrastructure proposed as part of the GO Rail Network Electrification Addendum are also being assessed. Should traditional electrification technology be selected by the successful proponent team, the OCS support structures will be positioned along the track at a maximum spacing of approximately 65m. The OCS design including placement of support structures would be finalized during the detailed design phase. The installation of OCS infrastructure will affect the viewshed along the rail corridors, particularly in areas of vegetation/tree clearing. Visual impact mitigation strategies for OCS will be identified and incorporated into the detailed design process. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor. Areas of 'high' visual impact (as defined in Appendix H2 of the EPR) will be identified and specific design measures will be incorporated to mitigate visual impacts of OCS. For a copy of the 2017 Visual Impact Assessment Report, please visit: http://www.metrolinx.com/en/aboutus/publications/environmental_assessment.aspx#electrification Compensation for any tree removals required as part of the GO Rail Network Electrification Project will be undertaken in accordance with Metrolinx's Vegetation Guideline (2020). To learn more about Metrolinx's Vegetation Management Strategy and Compensation Approach, please view the panels and Vegetation Guideline presented during the first two rounds of public consultation. Current construction activities along the Lakeshore East Corridor is not associated with the GO Rail Network Electrification Project. Vegetation removal associated with the GO Rail Network Electrification Project shall be undertaken in accordance with the mitigation and monitoring commitments identified in the 2017 EPR and/or the 2021 EPR Addendum. The Significant Addendum to the 2017 GO Rail Network Electrification Environmental Project Report (EPR) is now being undertaken and is anticipated to be complete Spring 2021, with detailed design to start later in 2021. The construction timeline start is currently estimated for 2022, with construction being phased across the GO Rail Network. Prior to the commencement of construction, the contractor will be required to develop and submit a detailed Construction Noise Management Plan to Metrolinx. Also, a Communications and Complaints Protocol will be developed by the contractor, which will indicate how and when surrounding local businesses and property owners/tenants will be informed of anticipated upcoming construction works (including work at night) and who they can contact should they have any concerns. For an update regarding upcoming construction along the Lakeshore East Corridor please see the link below for further information: https://blog.metrolinx.com/2020/12/17/construction-ahead-for-lakeshore-east-rail-corridor-heres-what-residents-can-expect/

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
5	Metrolinx Engage (Ask a Question)	Impact Assessment - Noise and Vibration	Noise and vibration mitigation Can you provide an update on measures that will be taken to provide noise and vibration mitigation in specific areas? For instance, the 2017 noise and vibration modelling report concludes that barriers are indeed feasible behind Darrell Avenue, just east of Woodbine. Considering how close the street is to the tracks, this is an absolute necessity in the case of expanded tracks and trains in that area. When will be be able to find out what the specific plans are for areas like that? If you are going to increase train volume that dramatically, you must take every possible measure to decrease noise and vibration. Thanks!	Since 2017, Metrolinx has developed a detailed design and service plan for how increased passenger service will be delivered for the GO Expansion program in the future, including a mix of diesel and electric propulsion. These proposed changes required a reassessment of potential noise and vibration effects as part of an addendum to the 2017 EPR. As part of the addendum, Metrolinx looked not only at where mitigation measures may be placed, but where their placement will benefit the most people. We also considered mitigation where the project will not increase noise significantly, but existing noise levels are already high. This updated assessment provides a clear understanding for residents, businesses and other properties along our corridors, on what noise and vibration impacts may affect them, and the mitigation measures that will be implemented. Metrolinx will go above and beyond regulatory requirements to mitigate noise and vibration as part of GO Expansion. The most effective form of mitigation is reducing or eliminating the sound at the source. Not only is source mitigation most effective, but it reduces sound levels for all properties along Metrolinx rail corridors, not only those identified as impacted in the EA Assessment. For example, Metrolinx has committed to installing exhaust noise silencers on existing and future Metrolinx diesel locomotives which will decrease the sound from these trains by 3 dB at all properties along the corridors. Where mitigation at the source itself is not possible, receptor-based mitigation such as noise walls are then considered to protect areas most affected. Since the previous EA was completed in 2017 Metrolinx has already contracted to build approximately 27.25 km of noise walls along the Barrie and Stouffville rail corridors where new track is being constructed. The area around the Lakeshore East corridor is an area where the project will not increase noise significantly, but existing noise levels are already high. Therefore, Metrolinx will go above and beyond the Ontario Provincial protocol, and include noise walls in this area. In addition, vibration mitigation for new tracks have also been recommended at this location. The supporting Draft Noise and Vibration Study for the Lakeshore East Corridor is available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-important- documents-0 An interactive map and roll plans showing the location of recommended noise and vibration mitigation has been presented as part of PIC #3 and can be viewed at the following link: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-noise-vibration- and-air-quality-studies
6	Metrolinx Engage (Ask a Question)	Electrification Benefits and Impacts	How will electrification reduce "greenhouse gases"? I can see that not running as many diesel locomotives will naturally eliminate them as a source of greenhouse gases, but the energy to power the trains still needs to come from somewhere. Is there enough capacity in Ontario's current generation capability to power a fully electrified GO system, or will additional generation capacity need to be brought online? If so, what form of generation is GO planning to support?	Metrolinx is committed to implementing electric rail service and improving air quality impacts from its trains. As part of the GO Rail Network Electrification Addendum, updated air quality studies have been undertaken to assess the potential impacts associated with Metrolinx's new detailed service plan. This study examines how emissions from Greenhouse Gases (GHGs) and other contaminants may change during the shift from existing operations to proposed future operations on a network-wide scale within the GO Expansion program area. You may be interested in viewing the study here, or reading the summary of Air Quality Assessment Updates here. The Province of Ontario, the Ministry of Energy, Northern Development and Mines, and the Independent Electricity Systems Operator (IESO) work collaboratively to maintain the electrical system in the Province as well as forecast future energy planning needs. Any cumulative demands on the network which result from electrification would be captured under IESO's energy planning mandate. At this time it is not anticipated that any new electrical supply would be required to operate electrified GO trains. Furthermore, Metrolinx and Hydro One are co-proponents of the GO Rail Network Electrification Project. The traction power supply for the network will be provided from Hydro One's existing high voltage grid via connections to new Traction Power Substations (TPS). Metrolinx has worked with Hydro One to ensure that the addition of an electrified GO train service does not impact the electrical supply/demand balance for Ontario's electricity system. More information on approved traction power supply and distribution components of the project were assessed in detail as part of the 2017 GO Rail Network Electrification Transit Project Assessment Process (TPAP), you can find the Environmental Project Report (EPR) and supporting technical studies here.

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
7	Metrolinx Engage (Ask a Question)	General	I live next to the tracks in . There was a proposed mobility hub site where our house is. That project looks like it is not happening but I see there is something on the Electrification map, but the legend is not in English. (Seriously) . Would like an English version. Our house has been in the family since 1967 long before Metrolinx existed. Trains are noisy, and mostly empty going back and forth wasting tax payers money and dumping diesel fumes into the air. The fence in our backyard between the rail and us is about 40 years old and compromised. would Metrolinx consider a precast barrier wall to provide security and privacy. The trains literally stop in our backyard and we are gawked at by the few riders there are.	Hi Thank you for reaching out to us during the GO Expansion Virtual Open House. As the dedicated Community Relations Specialist for your area, I'm happy to respond. The Newmarket GO Station is a designated mobility hub, which is a station where different modes of transportation come together seamlessly – not unlike the connection of the GO Barrie line and Viva Yellow bus route in your area. In 2018, Metrolinx completed a study of the Newmarket GO Station mobility hub to establish a vision for the area, provide guidance on how it should look and function, and recommend improvements for the GO station. This summer, for example, we made some of those improvements by installing new digital schedule signs and tactile plates were installed at the station for better wayfinding, safety and accessibility. If you are interested in learning more about the mobility hub study, you may find it here. As part of the GO Expansion Program, Metrolinx is committed to making the GO network better, faster and easier to move throughout the GTHA. Electrification is one way that we are doing this. Using electric trains on the Barrie corridor will not only allow for a more efficient, reliable service with faster trains, more frequent service and lower operating cost, but it will also mean quieter trains, reduction in greenhouse gases and improved local air quality. I understand your concerns about the condition of the fence located between you and the rail corridor. Could you kindly confirm if the fence in question is your fence or a Metrolinx owned fence? Perhaps send me a photo of the fence so that I can get a better sense of the issue? At this time there are no plans to build a noise mitigation barrier in this area. Finally, thank you for bringing to our attention that the French version of the electrification map is on the English webpage. I have notified the appropriate party and the site should be updated shortly. For your reference, I have attached the English version of the map to this email. If you have any further questions or concerns, please let me know.
8	Metrolinx Engage (Ask a Question)	TPAP Timeline	When will this be constructed?	The Significant Addendum to the 2017 GO Rail Network Electrification Environmental Project Report (EPR) is now being undertaken and is anticipated to be complete Spring 2021, with detailed design to start later in 2021. The construction timeline start is currently estimated for 2022, with construction being phased across the GO Rail Network. GO Expansion is part of a system wide project to design, build, operate and maintain the network, currently in the procurement phase. Once a proponent is selected there will be further information in terms of construction scheduling and sequencing. Updates will be provided to the public and stakeholders prior to construction.
9	Metrolinx Engage (Ask a Question)	Electrification Infrastructure	How does GO plan to address the problem of icing? During the winter months, overhead wires often accumulate ice, especially during icy precipitation or freezing rain events. How have other northern countries with electric rail service addressed this problem? What does GO plan to do?	The Overhead Contact System (OCS) for the GO Rail Network Electrification Project will be designed to meet both Canadian Standards Association (CSA) and American Railway Engineering and Maintenance-of-Way Association (AREMA) standards. Both standards require the OCS to be designed for extreme weather conditions, including temperatures of -40°C, wind speeds of up to 125 kph, and ice accumulation of 12.5 millimetres. Additionally, the OCS will be installed with tension compensation devices. These devices allow for changes due to climatic conditions, without causing the added stresses to the system. Typically the best way to avoid ice accumulation on the OCS is to continue train operation, which shakes the ice from the wires.
10	Metrolinx Engage (Ask a Question)	TPAP Process - Consultation	How will construction impacts on neighbouring homes be mitigated If night construction work is planned, will residents be temporarily relocated to hotels to prevent loss of sleep?	When possible, construction will be limited to the time periods allowed by the applicable local bylaws (generally during the daytime hours and during weekdays). However, certain types of construction work can only be completed when trains are not in service (i.e., outside of business hours). Prior to the commencement of construction, the contractor will be required to develop and submit a detailed Construction Noise Management Plan to Metrolinx. Also, a Communications and Complaints Protocol will be developed by the contractor, which will indicate how and when surrounding local businesses and property owners/tenants will be informed of anticipated upcoming construction works (including work at night) and who they can contact should they have any concerns. Metrolinx has developed an Information Sheet on Construction Management that was prepared as part of the consultation materials presented in Round 1 (held February 2020). Please see the link below for further information: https://www.metrolinxengage.com/sites/default/files/info_sheet_6_-_construction_mgmt_-_final2.pdf.

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11	Metrolinx Engage (Ask a Question)	Electrification Infrastructure	Hydrogen technology Metrolinx had previously considered hydrogen trains for the electrification of the GO network. I personally thought that this was a risky proposition to use untested technology. I haven't seen hydrogen mentioned in a while. Has this idea been dropped?	Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network. That's why, in addition to studying the environmental impacts of traditional electrification, Metrolinx has studied the feasibility of another form of electrification - hydrogen powered vehicles. Both options have been studied as part of the Transit Project Assessment Process (TPAP) for the GO Expansion program. The successful proponent team will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion, and bidders will be able to propose hydrail or overhead wire technology to electrify the GO network. The contract is in a multi-year procurement process, and currently teams are completing the bids that will close in summer 2021. Construction will get underway in 2022.
12	Regional Email	Impact Assessment - Noise and Vibration	Good Morning, I know that I speak for the entire community which is certainly well over 1,000 people when I say that we are overjoyed to see that Metrolinx will be building a noise barrier along the south side of the tracks from Monarch park to Wildwood Park. I'm sorry to see that parks will not be protected and it's possible that the noise will render Wildwood Park unusable. However, there is progress after four years. I'm writing to ask for details regarding what look like new standards for Construction Noise and Vibration. Can you tell us what these standards are? (Last slide) https://www.metrolinxengage.com/sites/default/files/goelectrification_noise_and_vibration_study_1.pdf As you know, construction has begun in our area and if there exposure limits or industry best practices then they have not been in evidence. Can you tell us exactly what this new promise means? If there are improvements to come can you let us know when they will come into being? I know that you and your colleagues work very hard to try to keep us up to date. I can see this effort and I want you to know that I appreciate it. Earlier this morning I wrote that it seems as if Metrolinx management consists exclusively of refugees from the Soviet Politburo. I was in the Soviet Union in 1969/1970 and I remember Pravda was four pages long with two of the pages reporting sports. It's not easy to get information from that kind of organization. Thank you,	Yes, you are correct that additional noise walls have been proposed in proximity to the referenced location along the Lakeshore East corridor as a mitigation measure that goes above and beyond the Ontario Provincial protocol to ensure noise walls are recommended in communities that are already experiencing high background noise. The additional noise wall on the south side of the tracks will assist in reducing noise at adjacent noise receptors, open spaces and community facilities such as Wildwood Crescent Playground. In addition, recommended vibration mitigation for new track within this segment of the corridor is proposed as well. The supporting Draft Noise and Vibration Study for the Lakeshore East (LSE) Corridor is available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-important-documents-0 Prior to the commencement of construction, the contractor will be required to develop and submit a detailed Construction Noise Management Plan to Metrolinx. Also, a Communications and Complaints Protocol will be developed by the contractor, which will indicate how and when surrounding local businesses and property owners/tenants will be informed of anticipated upcoming construction works (including work at night) and who they can contact should they have any concerns. Metrolinx has developed an Information Sheet on Construction Management that was prepared as part of the consultation materials presented in Round 1 (held February 2020). Please see the link below for further information: https://www.metrolinxengage.com/sites/default/files/info_sheet_6_-_construction_mgmt_-_final2.pdf. The Draft Noise and Vibration Study for the LSE Corridor provided at the link in the above response included a construction noise and vibration assessment for activities associated with electrification. Recommendations for a number of mitigation measures and monitoring activities to be undertaken during the construction phase of the project are provided in Table 12 With respect to construction currently underway, as was identified during our site walk at Small's Creek, we have asked our LSE West contractors to follow Metrolinx's Noise and Vibration Guideline (included in the contract). The guideline is developed with consideration to the unique challenges associated with maintaining a large mass transit system, with due regard to short-term and longer-term community effects, existing industry best-practices, and the Canadian regulatory context. Metrolinx is committed to further discussions with the community as the project advances. We will be in a position to speak to exactly what specific noise mitigation and monitoring approaches will be undertaken when the contractor has developed a workplan and schedule. Throughout the project, Metrolinx is committed to sharing information on upcoming work and expected noise impacts. For the Lakeshore East Early Works program Metrolinx has committed to provide a dedicated phone line to register concerns on a 24 hour basis. The Significant Addendum to the 2017 GO Rail Network Electrification Environmental Project Report (EPR) is now being undertaken and is anticipated to be complete Spring 2021, with detailed design to start later in 2021. These proposed changes require a reassessment of potential noise, vibration, and air quality impacts and the associated mitigation measures, undertaken in the 2021 Addendum to the 2017 GO Rail Network Electrification TPAP. Technical documentation related to noise mitigation for construction work is identified in the draft Lakeshore East Noise and Vibration Assessment – starting on page 48. Construction activities associated with the GO Rail Network Electrification Project will comply with the recommended mitigation measures and monitoring activities documented within the Draft Noise and Vibration Study for the LSE Corridor. The construction timeline start is currently estimated for 2022, with construction being phased across the GO Rail Network.

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13	Metrolinx Engage (Ask a Question)	TPAP Timeline	Coordination of GO electrification with Ontario Line Metrolinx has promised that the Ontario Line will be electric. Do you promise that the work to electrify Line 4 in the Joint corridor where the Ontario Line and GO will run side-by-side will be done at the same time as the Ontario Line work? That is, will you do all of the construction work for both of these projects at the same time so we don't have to live through this disruption twice?	At Metrolinx, our delivery teams for GO Expansion and the Ontario Line are working very closely to coordinate the required early work for both projects. However, both projects are in the procurement phase, and construction phasing and schedules will be submitted by the proponent teams as part of their bids. Once the proponents are on board, we will continue to look at the best way to coordinate the work and find the most efficient way to deliver both projects. Limiting the amount of tunnelling and excavation needed for the Ontario Line project reduces its complexity, which in turn helps reduce construction timelines and impacts. This will be done by aligning Ontario Line operations within sections of existing above-ground rail corridors in the western and eastern segments of the line, and along elevated structures in the northern segment. In communities like Riverside, we are also able to streamline our work with existing GO Expansion plans along the rail corridor, which reduces the number of construction zones and related impacts in the surrounding community. While doing this work, we will also deliver noise walls alongside a robust package of other mitigation measures to address both noise and vibration. In the joint corridor (a shared railway where Ontario Line will run parallel to GO), early works within and along the rail corridor will proceed ahead of station and track construction. Planned early works, from Eastern Avenue to Logan Avenue, include: • GO rail corridor expansion to accommodate two Ontario Line tracks and 4th GO track • Installation or upgrading of vegetated slopes or retaining walls and noise barriers next to the corridor, where appropriate • Relocation or protection of utilities • Construction of new Ontario Line bridges on each side of the existing at Queen Street East, Dundas Street East and Logan Avenue bridges This work will proceed following an early works environmental assessment and related consultations, including consultations with Indigenous communities and the public. Significant design and engineering efforts have been made to ensure the six-track corridor does not significantly impact bordering properties or other ongoing infrastructure projects. Using the existing rail corridor and streamlining Ontario Line construction work with planned GO Expansion means we can keep mostly within an existing footprint and minimize impacts to surrounding neighbourhoods. Early works will begin in 2021. More details, including timelines, will be shared as procurement advances. To stay informed about upcoming work and future consultations, sign up for updates.
14	Metrolinx Engage (Feedback Form)	TPAP Timeline	8. Any other comments or advice you'd like to share with the team? I want to be sure that you coordinate the construction of the GO expansion in Lakeshore East corridor with the Ontario Line that will run on the same corridor. We do not want to live through the mess of construction twice. Do all of the electrification at once. 9. Please provide an email if you would like our Community Relations team to follow up on your feedback.	At Metrolinx, our delivery teams for GO Expansion and the Ontario Line are working very closely to coordinate the required early work for both projects. However, both projects are in the procurement phase, and construction phasing and schedules will be submitted by the proponent teams as part of their bids. Once the proponents are on board, we will continue to look at the best way to coordinate the work and find the most efficient way to deliver both projects. Limiting the amount of tunnelling and excavation needed for the Ontario Line project reduces its complexity, which in turn helps reduce construction timelines and impacts. This will be done by aligning Ontario Line operations within sections of existing above-ground rail corridors in the western and eastern segments of the line, and along elevated structures in the northern segment. In communities like Riverside, we are also able to streamline our work with existing GO Expansion plans along the rail corridor, which reduces the number of construction zones and related impacts in the surrounding community. While doing this work, we will also deliver noise walls alongside a robust package of other mitigation measures to address both noise and vibration. In the joint corridor (a shared railway where Ontario Line will run parallel to GO), early works within and along the rail corridor will proceed ahead of station and track construction. Planned early works, from Eastern Avenue to Logan Avenue, include: • GO rail corridor expansion to accommodate two Ontario Line tracks and 4th GO track • Installation or upgrading of vegetated slopes or retaining walls and noise barriers next to the corridor, where appropriate • Relocation or protection of utilities • Construction of new Ontario Line bridges on each side of the existing at Queen Street East, Dundas Street East and Logan Avenue bridges This work will proceed following an early works environmental assessment and related consultations, including consultations with Indigenous communities and the public. Significant design and engineering efforts have been made to ensure the six-track corridor does not significantly impact bordering properties or other ongoing infrastructure projects. Using the existing rail corridor and streamlining Ontario Line construction work with planned GO Expansion means we can keep mostly within an existing footprint and minimize impacts to surrounding neighbourhoods. Early works will begin in 2021. More details, including timelines, will be shared as procurement advances. To stay informed about upcoming work and future consultations, sign up for updates.

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15	Metrolinx Engage (Ask a Question)	Electrification Infrastructure	What is an "electric train"? “Electric trains accelerate and slow down faster, while maintaining higher speeds better than heavy diesel locomotives. This results in trains and service that runs up to 29% faster.” I hope Metrolinx understands what defining expectations means. Only a couple of years ago, Metrolinx explained that it was merely replacing the diesel locomotives with electric locomotives and keeping the heavy rail passenger coaches. There is only a minor performance difference between a train with “electric locomotives” and passenger coaches and a diesel locomotive and the same passenger coaches. An “electric train” with light body passenger coaches and light propulsion system (like an EMU) will perform much faster. Question 1 Does the electrification project include replacing only the diesel locomotives with electric locomotives or a complete change of rolling stock to “electric trains”? Question 2 If the answer is only replacing the locomotives, what is the improvement of service, still 29%? “the GO Expansion program also includes ...signal upgrades.” You are not staying on topic. As part of the electrification project you said “This results in trains and service that runs up to 29% faster.” The GO Expansion program does the signal upgrades, not the electrification project. Realistic faster service can only occur with signal upgrades. A couple of years ago Metrolinx said signal upgrades were scheduled for 2026-7. Question 3 What say Metrolinx? I hope Metrolinx understands what defining expectations means.	The GO Expansion project includes new trains, signals, systems, track, electrification infrastructure, as well as the maintenance and operation of the system for years to come. The successful proponent team will be responsible for procuring and operating new trains to a world-class standard and selecting and delivering the right infrastructure to unlock the benefits of GO Expansion. The proponent will select the infrastructure (signals, electrification, etc.) and trains to meet the performance standard set out in the bid documents. Today, we run 1,500 weekly trips on the GO Transit system. Each year we’re adding more, and when we’re done building, we’ll be running over 6,000 weekly trips. The service increase will be delivered by new trains procured as part of the contract. Current diesel trains will continue to operate on the system as well, on corridors that are not fully owned by Metrolinx, and will not be fully electrified. The contract is in a multi-year procurement process, and currently teams are completing the bids that will close in 2021. Construction will get underway in 2022.

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16	Metrolinx Engage (Ask a Question)	Impact Assessment - Noise and Vibration	Increase noise and vibration With the expansion of service across the GTA, there has been increase noise, vibrations, and horns of all GO trains headings towards Union Station at all hours of the day from 5am-2am. Can sound barriers be improved on all routes within the Toronto downtown core? (ie. Liberty Village, CityPlace, Union, Distillery, Corktown)	Since approval of the GO Rail Network Electrification TPAP in 2017, Metrolinx has developed a detailed service plan for how increased passenger service will be delivered for the GO Expansion program in the future, including a mix of diesel and electric trains. These proposed changes require a reassessment of potential noise, vibration, and air quality impacts and the associated mitigation measures, undertaken in the 2021 Addendum to the 2017 GO Rail Network Electrification TPAP. Detailed information regarding noise and vibration studies, including operational mitigation measures such as noise walls have been presented as part of PIC #3 and can be viewed at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-noise-vibration-and-air-quality-studies It is noted that certain portions of the Union Station Rail Corridor (USRC), such as the portion west of Union Station are outside of the GO Rail Network Electrification Addendum study area. Noise and Vibration assessments will be undertaken for increased service levels in those areas as part of a separate Metrolinx undertaking. The most effective form of mitigation is reducing or eliminating the sound at the source. Not only is source mitigation most effective, but it reduces sound levels for all properties along Metrolinx rail corridors. Metrolinx will implement a number of source mitigation measures across the network, including: • Installing exhaust noise silencers on existing and future Metrolinx diesel locomotives, which will decrease the sound from these trains by an estimated 3 dB at all properties along the corridors. • Where possible, using 6-car rather than 12-car trains during off-peak periods. • Using EMUs along the Stouffville and Kitchener corridors. • Reducing engine idling. • Improvements to tracks and switches to reduce vibration and noise. • Installation of ballast mats underneath new tracks and switches to reduce vibration. The largest reduction of potential noise increases will come from electrification on core segments of the network, such as the USRC. The bulk of service increases will be delivered by electric trains, which are near silent at low speeds, starting or stopping, and when stopped. At Metrolinx, safety is our number one priority, and bells, whistles and horns play an important role in keeping people out of harm's way. Train bells, whistles and horns are a requirement under the Railway Safety Act which is administered and regulated by the federal government, through Transport Canada. Metrolinx must adhere to the specific safety rules for sounding bells, whistles and horns. They are used in different ways for different situations and the unnecessary use of them is not permitted. Horns and whistles may be used when approaching at-grade crossings or in cases of emergencies. Bells are used at stations and layovers including on approach; however, these are for safety concerns and generally cannot be avoided.
17	Metrolinx Engage (Ask a Question)	Impact Assessment - Construction Impacts	Raildeck Park Would the installation of electrification hinder the potential for building on top of rail corridor/ rail yard for Rail Deck Park, Oxford proposed park, and CIBC Square/Union park?	The electrification of the Union Station Rail Corridor (USRC) between Bathurst Street and Union Station was assessed as part of the 2014 UP Express Electrification Project Transit Project Assessment Process (TPAP). The EPR and supporting technical studies are available for review at: http://www.metrolinx.com/en/aboutus/publications/environmental_assessmen... Metrolinx will continue to work with the City of Toronto and/or private developers with respect to the protection and/or integration of electrification infrastructure within any future developments proposed over the USRC. It is noted that Metrolinx has been involved in the CIBC Square Park initiative. Please see the link below for further information: https://blog.metrolinx.com/2020/04/08/photo-update-rail-deck-spans-acros...

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18	Metrolinx Engage (Ask a Question)	Impact Assessment - Noise and Vibration	1. What do you like about GO Expansion? : Access for the GTA community 2. Are there any specific features, sensitive locations and areas of interest that were not identified in the 2017 Electrification TPAP, that you feel should be addressed in this Electrification EPR Addendum? : Toronto CityPlace (Bathurst to Blue Jay Way) - why do all the trains blow their horn in this area, accelerate their engine and send lots of exhaust in the air, conduct 8pm-3am rail construction, and have no sound barriers of noise travelling up? 3. For noise and vibration, are there any sensitive areas, neighbourhoods or locations that you feel have not been identified or sufficiently addressed in the assessments? Toronto CityPlace - with increased traffic to service GTA, Toronto residents now have a train running every 5 minutes as trains consolidate at Union station. The vibration shakes the building and they blow horns at all times 4. Do you have any questions about the one-time only Enhanced Noise Mitigation Program being offered? Can they build sound barriers to prevent more sound going up? Or build a shelter to block sound? 5. For air quality, are there any sensitive areas, neighborhoods or locations that you feel have not been identified or sufficiently addressed in the assessments? Toronto CityPlace - all trains seems to accelerate here leaving black exhaust on the bridge 6. Are there any mitigation measures for construction, operation and maintenance of the electrified GO rail network that you feel are missing? If so, do you have any suggestions for the Project Team? They should not only test decimal sounds at ground level, but at different areas (sidewalk, bridge, overpass, and possibly nearby buildings balconies 7. Are there any concerns or other impacts associated with electrification that you'd like us to consider? : 8. Any other comments or advice you'd like to share with the team? : Why has there been construction outside the Bathurst rail yard since Jan 1,2020 from 8pm to 3 am everyday? 9. Please provide an email if you would like our Community Relations team to follow up on your feedback.:	Thank you. Metrolinx is improving service as part of the GO Expansion Program by increasing train frequency and availability. The long-term goal and vision of the GO Expansion Program is to provide 15-minute two-way all-day service on core segments of the rail network. At Metrolinx, safety is our number one priority, and bells, whistles and horns play an important role in keeping people out of harm's way. Train bells, whistles and horns are a requirement under the Railway Safety Act which is administered and regulated by the federal government, through Transport Canada. Metrolinx must adhere to the specific safety rules for sounding bells, whistles and horns. They are used in different ways for different situations and the unnecessary use of them is not permitted. Horns and whistles may be used when approaching at-grade crossings or in cases of emergencies. Bells are used at stations and layovers including on approach; however, these are for safety concerns and generally cannot be avoided. When possible, construction is limited to the time periods allowed by the applicable local bylaws (generally during the daytime hours and during weekdays). However, certain types of construction work can only be completed when trains are not in service (i.e., outside of business hours). With respect to air quality, please see our response to comment #5 below. With respect to noise and associated mitigation (such as noise barriers), please see our response to comment #4 and #6 below. Metrolinx has developed a detailed service plan for how increased passenger service will be delivered for the GO Expansion program in the future, including a mix of diesel and electric trains. These proposed changes require a reassessment of potential noise, vibration, and air quality impacts and the associated mitigation measures, undertaken in the 2021 Addendum to the 2017 GO Rail Network Electrification TPAP. Detailed information regarding noise and vibration studies, including operational mitigation measures such as noise walls have been presented as part of PIC #3 and can be viewed at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-noise-vibration-and-air-quality-studies It is noted that certain portions of the Union Station Rail Corridor (USRC), such as the portion west of Union Station are outside of the GO Rail Network Electrification Addendum study area. Noise and Vibration assessments will be undertaken for increased service levels in those areas as part of a separate Metrolinx undertaking for the UP Express Electrification TPAP. The most effective form of mitigation is reducing or eliminating the sound at the source. Not only is source mitigation most effective, but it reduces sound levels for all properties along Metrolinx rail corridors. For high-rises and condos along the right-of-way, noise mitigation walls are not a viable option. However Metrolinx will implement a number of source mitigation measures across the network, including: • Installing exhaust noise silencers on existing and future Metrolinx diesel locomotives, which will decrease the sound from these trains by an estimated 3 dB at all properties along the corridors. • Where possible, using 6-car rather than 12-car trains during off-peak periods. • Using EMUs along the Kitchener corridors. • Reducing engine idling. • Improvements to tracks and switches to reduce vibration and noise. • Installation of ballast mats underneath new tracks and switches to reduce vibration. The largest reduction of potential noise increases will come from electrification on core segments of the network, such as the USRC. The bulk of service increases will be delivered by electric trains, which are near silent at low speeds, starting or stopping, and when stopped. Metrolinx is committed to reducing local air pollution emissions by implementing the following measures: • Electrify the system to the maximum extent possible • Make future diesel engine purchases and rebuilds compliant with the Tier 4 exhaust emission standards • Reduce idling with technical and operational means • Store only electric trains at the Bathurst and Wilson Yard Layovers, eliminating diesel engine idling and related emissions • Idling will also be reduced through the implementation of technical and operational changes. A summary of the key findings of the Air Quality Assessment Update can be viewed here: https://www.metrolinxengage.com/sites/default/files/goelectrification_air_quality_study.pdf The supporting Draft Regional Air Quality Study is available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-important-documents-0

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				With respect to assessing potential impacts associated with noise and vibration and to determine when mitigation is warranted, Metrolinx follows a specific Ontario Provincial Protocol (Ministry of Environment, Conservation and Parks (MECP)/GO Transit Protocol for Noise and Vibration Assessment). Noise receptors along the rail corridor were considered as part of the updated assessments. Under the Ontario Provincial Protocol, mitigation is considered under the following conditions: Noise: Where post-project noise exposure levels are expected to exceed, by at least 5 dBA, corresponding pre-project levels or MECP objectives (55 dBA for daytime and 50 dBA for nighttime) – whichever are greater. Vibration: Where pre-project vibration exposure is expected to exceed its pre-project level or the MECP objective (0.14mm/s) by at least 25% - whichever is greater. More detailed information regarding the Noise and Vibration Assessment Update presented as part of PIC #3, including further clarification regarding assessment methodology and mitigation is available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-noise-vibration-and-air-quality-studies Metrolinx has many construction projects in the Union Station Rail Corridor (USRC) which is extremely busy during normal operating hours. Certain types of construction work can only be completed when trains are not in service (i.e., outside of business hours). To receive community updates please sign up at TorontoWest@metrolinx.com.
19	Metrolinx Engage (Ask a Question)	Project Scope	Will Aldershot be included in 15 minute (electrified) service? In previous documents, Aldershot was shown as the western terminus for the electrified portion of the Lakeshore West line. Recent documents show the terminus now at Burlington station. Why was this changed? And what does this mean for mobility hub / major transit station area planning for the vicinity of the Aldershot GO station, which is being planned for high-density development?	The 2017 GO Rail Network Electrification Transit Project Assessment Process and Environmental Project Report looked at Burlington GO Station as the terminus of electrified service. The portion of track between Burlington and Aldershot GO Stations is owned by Canadian National Railway. For now we are working on implementing electrification on the areas of our network we do own. We are also always working with our freight partners to find better ways to coexist and bring more and better service to all communities we serve. We are working on ways to improve the customer experience and upgrade our infrastructure. You can find more information on our approach to station improvements on Metrolinx.com. Also, please sign up to the Halton Region newsletter to be kept up to date with working happening at your station here. Thank you,

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20	Metrolinx Engage (Ask a Question)	Electrification Benefits and Impacts	Where is the hydrogen power alternative study?	Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network. That's why, in addition to studying the environmental impacts of traditional electrification, Metrolinx has studied the feasibility of another form of electrification - hydrogen powered vehicles. Both options have been studied as part of the Transit Project Assessment Process (TPAP) for the GO Expansion program. The successful proponent team will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion, and bidders will be able to propose hydrail or overhead wire technology to electrify the GO network. The contract is in a multi-year procurement process, and currently teams are completing the bids that will close in summer 2021. Construction will get underway in 2022. For further information regarding hydrail and the associated feasibility study undertaken, please visit: http://www.metrolinx.com/en/news/announcements/hydrail- resources/Hydrail%20Factsheet_Feb21.pdf
21	Metrolinx Engage (Ask a Question)	Electrification Infrastructure	Dishonest Process and where is the hydrogen power study? When I first communicated with Metrolinx 4 years ago, Metrolinx said they were studying alternative means of propulsion. What I read gave the impression that Metrolinx was genuinely open to considering electric and hydrogen power. I now read today that the final decision employing electrification was finalized in 2017. I and I assume many others, feel duped. I was under the impression that hydrogen power was going to be given serious consideration in my correspondence with Metrolinx. This communication was not honest.The documents today provide no indication that hydrogen power is even on the table. Who wants the view of unsightly overhead wires and towers from your home windows? The installation and upkeep of this kind of infrastructure must be enormous. Was there outside pressure from the privatized electrical generation industry or government to pursue electrification only? In the meantime, European nations have already started using hydrogen-powered trains. Germany has a hydrogen-powered line doing very well and Britain has advanced planning to use the same technology on a main north-south express link. Why hydrogen powered trains? The only infrastructure would be 2 or 3 hydrogen refuelling staions. It is a proven technology, especially for trains, trucks and busses. There would be no costly and unsightly overhead wires. The only exhaust is water. Yes, there would be costs to convert the locomotives but so too with electrification. I can't help but sense that all these studies and the supposed involvement of the public are nothing but an expensive and dishonest ruse. The public provides serious input but their ideas and concerns are pretty much tossed to the side. These window-dressing attempts to placate the populace are detoured to the wastebasket while the powers that be push their own agenda. No doubt Metrolinx and some readers will see this memo as nothing more than the rantings of some misguided kook. So be it. But, perhaps, it might open some discussion on the broader issue of how Metrolinx really works.	GO Expansion is part of a system wide project to design, build, operate and maintain the network, and it is currently in a multi-year procurement process. Right now, teams are completing the bids that will close in summer 2021 and construction will get underway in 2022. The successful proponent will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion, and bidders will be able to propose hydrogen-powered vehicles or overhead wire technology to electrify the GO network. So hydrogen is by no means off the table – we're simply leaving it up to the market to determine what is the most effective technology in order to achieve the service levels we want to introduce. We are committed to finding the most sustainable solution for electrifying the GO rail network, and we have studied different options for electrification. As part of the Transit Project Assessment Process (TPAP) for the GO Expansion program we have studied both the environmental impacts of traditional electrification and the feasibility of electrification using hydrogen powered vehicles (hydrail). You can find information regarding hydrail and the associated feasibility study undertaken here: http://www.metrolinx.com/en/news/announcements/hydrail-resources/Hydrail... As part of the 2017 GO Rail Network Electrification TPAP, we assessed the visual impacts of the Overhead Contact System (OCS) for traditional electrification. These impacts would include wires and poles along the rail corridor. You can find this assessment in the Visual Impact Assessment Report (Appendix H2 of the EPR). If the successful proponent selects traditional electrification, then the OCS design, including the placement of support structures, would be finalized during the detailed design stage. During this stage, visual impact mitigation strategies for OCS will be identified and incorporated. These strategies will address the range of conditions, area allocations, and mitigation needs along the corridor. Areas of 'high' visual impact (as defined in Appendix H2 of the EPR) will be identified, and specific design measures will be incorporated to mitigate visual impacts for these areas.

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
22	Metrolinx Engage (Ask a Question)	Electrification Infrastructure	When will electrification start? In what order will the GO lines be electrified. Will the UP Express be electrified as well?	The Significant Addendum to the 2017 GO Rail Network Electrification Environmental Project Report (EPR) is now being undertaken to assess additional electrification infrastructure required for new tracks and layover facilities (which are being studied as part of a separate Metrolinx study called "New Track & Facilities TPAP" and "Scarborough Junction Grade Separations TPAP") proposed across various portions of the GO rail network that were not previously examined as part of the 2017 Environmental Project Report (EPR). In addition, updated assessments of noise, vibration and air quality associated with increased service levels across six Metrolinx-owned rail corridors are also being undertaken. The TPAP Addendum is anticipated to be complete Spring 2021, with detailed design to start later in 2021. The GO Expansion construction timeline start is currently estimated for 2022, with construction being phased across the GO Rail Network. In 2014, Metrolinx completed an environmental assessment to electrify the UP Express service from Union Station to Pearson International Airport. The EPR and supporting technical studies are available for review at: http://www.metrolinx.com/en/aboutus/publications/environmental_assessmen... GO Expansion is part of a system wide project to design, build, operate and maintain the network and is currently in the procurement phase. Once a proponent is selected there will be further information in terms of construction scheduling and sequencing. Updates will be provided to the public and stakeholders prior to construction.
23	Metrolinx Engage (Ask a Question)	TPAP Timeline	When will Lakeshore East be electrified? I seem to remember a 2020 promise.	The Significant Addendum to the 2017 GO Rail Network Electrification Environmental Project Report (EPR) is now being undertaken to assess additional electrification infrastructure required for new tracks and layover facilities (which are being studied as part of a separate Metrolinx study called "New Track & Facilities TPAP" and "Scarborough Junction Grade Separations TPAP") proposed across various portions of the GO rail network that were not previously examined as part of the 2017 Environmental Project Report (EPR). In addition, updated assessments of noise, vibration and air quality associated with increased service levels across six Metrolinx-owned rail corridors are also being undertaken. The TPAP Addendum is anticipated to be complete Spring 2021, with detailed design to start later in 2021. The GO Expansion construction timeline start is currently estimated for 2022, with construction being phased across the GO Rail Network. GO Expansion is part of a system wide project to design, build, operate and maintain the network, currently in the procurement phase. Once a proponent is selected there will be further information in terms of construction scheduling and sequencing. Updates will be provided to the public and stakeholders prior to construction. We encourage residents to sign up to our eNewsletter which can be found here at https://metrolinx.us4.list-manage.com/subscribe?u=e3e2dcbefa63d1ca424de3...
24	Metrolinx Engage (Ask a Question)	Electrification Infrastructure	Will any of the planned noise walls let light through? If so, how much and where? I think see-through walls should be considered whenever there's a street running next to the tracks.	GO Expansion is part of a system wide project to design, build, operate and maintain the GO network, and is currently in the procurement phase. Once a proponent is selected, further planning such as detailed design will occur. Having said this, a Reference Concept Design (RCD) for recommended noise walls is currently being undertaken and specifications for materials / aesthetics are being developed. During the detailed design phase, considerations for the placement of transparent acrylic panels within the wall may be reviewed for specific locations, given the acoustic performance requirements for noise reduction can be achieved. Kindly note that transparent panels would have certain requirements such as the application of black stripes vertically or horizontally for bird protection, be capable of withstanding graffiti, be resistant to weathering and meet requirements for wind loading. To stay up to date about the progression of recommended noise walls in your area, you may wish to subscribe to the e-newsletter in your region here.
25	Metrolinx Engage (Ask a Question)	Electrification Infrastructure	Are Hydrogen-powered trains being considered for the new Lines? And if not, is there any infrastructure being built in to accomodate such trains in the future?	Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network. That's why, in addition to studying the environmental impacts of traditional electrification, Metrolinx has studied the feasibility of another form of electrification - hydrogen powered vehicles. Both options have been studied as part of the Transit Project Assessment Process (TPAP) for the GO Expansion program. The successful proponent team will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion, and bidders will be able to propose hydrail or overhead wire technology to electrify the GO network. The contract is in a multi-year procurement process, and currently teams are completing the bids that will close in summer 2021. Construction will get underway in 2022.

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
26	Metrolinx Engage (Ask a Question)	Impact Assessment - Noise and Vibration	In regards to the noise and vibration from increased service levels, what will be done for existing residential areas that already have noise walls and are not located near a station? Residents will have additional noise and vibration that will affect their quality of life including the damage to their homes from the additional vibration. In addition, how will the construction impact residents in relation to the noise impacts?	As part of the GO Rail Network Electrification Addendum, updated noise and vibration studies have been undertaken to assess potential impacts associated with Metrolinx's new detailed service plan. The new noise and vibration studies being undertaken for the upcoming Electrification TPAP Addendum supersede the previous 2017 studies. With respect to assessing potential impacts associated with noise and vibration and to determine when mitigation is warranted, Metrolinx follows a specific Ontario Provincial Protocol (Ministry of Environment, Conservation and Parks (MECP)/GO Transit Protocol for Noise and Vibration Assessment). Noise receptors along the rail corridor were considered as part of the updated assessments, regardless of existing noise barriers or proximity to a GO Station. Under the Ontario Provincial Protocol, mitigation is considered under the following conditions: Noise: Where post-project noise exposure levels are expected to exceed, by at least 5 dBA, corresponding pre-project levels or MECP objectives (55 dBA for daytime and 50 dBA for nighttime) – whichever are greater. Vibration: Where pre-project vibration exposure is expected to exceed its pre-project level or the MECP objective (0.14mm/s) by at least 25% - whichever is greater. More detailed information regarding the Noise and Vibration Assessment Update presented as part of PIC #3, including further clarification regarding assessment methodology and mitigation is available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-noise-vibration-and-air-quality-studies The supporting Draft Noise and Vibration Studies undertaken are available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-important-documents-0 The most effective form of mitigation is reducing or eliminating the sound at the source. Not only is source mitigation most effective, but it reduces sound levels for all properties along Metrolinx rail corridors. Metrolinx will implement a number of source mitigation measures across the network, including: • Installing exhaust noise silencers on existing and future Metrolinx diesel locomotives, which will decrease the sound from these trains by an estimated 3 dB at all properties along the corridors. • Where possible, using 6-car rather than 12-car trains during off-peak periods. • Using EMUs along the Stouffville and Kitchener corridors. • Reducing engine idling. • Grade separations, which reduce noise by avoiding deceleration, idling and acceleration by both road and rail transportation vehicles. • Improvements to tracks and switches to reduce vibration and noise. • Installation of ballast mats underneath new tracks and switches to reduce vibration. The largest reduction of potential noise increases will come from electrification on core segments of the network. The bulk of service increases will be delivered by electric trains, which are near silent at low speeds, starting or stopping, and when stopped. Prior to the commencement of construction, the contractor will be required to develop and submit a detailed Construction Noise Management Plan to Metrolinx. Also, a Communications and Complaints Protocol will be developed by the contractor, which will indicate how and when surrounding local businesses and property owners/tenants will be informed of anticipated upcoming construction works (including work at night) and who they can contact should they have any concerns. Metrolinx has developed an Information Sheet on Construction Management that was prepared as part of the consultation materials presented in Round 1 (held February 2020). Please see the link below for further information: https://www.metrolinxengage.com/sites/default/files/info_sheet_6_-_construction_mgmt_-_final2.pdf

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
27	Metrolinx Engage (Ask a Question)	Impact Assessment - Noise and Vibration	1. What do you like about GO Expansion? 2. Are there any specific features, sensitive locations and areas of interest that were not identified in the 2017 Electrification TPAP, that you feel should be addressed in this Electrification TPAP Addendum? 3. For noise and vibration, are there any sensitive areas, neighbourhoods or locations that you feel have not been identified or sufficiently addressed in the assessments? I don't believe that existing residential areas with noise walls have been considered in these evaluations. With the increase in noise and vibration from additional service levels, there doesn't seem to be any consideration on the impact on quality of life. Homeowners will be responsible for the damages to their homes from the additional vibrations that they had no control of. I hope that these issues are being considered. 4. Do you have any questions about the one-time only Enhanced Noise Mitigation Program being offered? 5. For air quality, are there any sensitive areas, neighborhoods or locations that you feel have not been identified or sufficiently addressed in the assessments? 6. Are there any mitigation measures for construction, operation and maintenance of the electrified GO rail network that you feel are missing? If so, do you have any suggestions for the Project Team? Residents will need to continue to live while this construction occurs and I hope that the impact of the construction on local residents is considered too. 7. Are there any concerns or other impacts associated with electrification that you'd like us to consider? 8. Any other comments or advice you'd like to share with the team? 9. Please provide an email if you would like our Community Relations team to follow up on your feedback.	As part of the GO Rail Network Electrification Addendum, updated noise and vibration studies have been undertaken to assess potential impacts associated with Metrolinx's new detailed service plan. The new noise and vibration studies being undertaken for the upcoming Electrification TPAP Addendum supersede the previous 2017 studies. With respect to assessing potential impacts associated with noise and vibration and to determine when mitigation is warranted, Metrolinx follows a specific Ontario Provincial Protocol (Ministry of Environment, Conservation and Parks (MECP)/GO Transit Protocol for Noise and Vibration Assessment). Noise receptors along the rail corridor were considered as part of the updated assessments, regardless of existing noise barriers. Under the Ontario Provincial Protocol, mitigation is considered under the following conditions: Noise: Where post-project noise exposure levels are expected to exceed, by at least 5 dBA, corresponding pre-project levels or MECP objectives (55 dBA for daytime and 50 dBA for nighttime) – whichever are greater. Vibration: Where pre-project vibration exposure is expected to exceed its pre-project level or the MECP objective (0.14mm/s) by at least 25% - whichever is greater. More detailed information regarding the Noise and Vibration Assessment Update presented as part of PIC #3, including further clarification regarding assessment methodology and mitigation is available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-noise-vibration-and-air-quality-studies The supporting Draft Noise and Vibration Studies undertaken are available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-important-documents-0 The most effective form of mitigation is reducing or eliminating the sound at the source. Not only is source mitigation most effective, but it reduces sound levels for all properties along Metrolinx rail corridors. Metrolinx will implement a number of source mitigation measures across the network, including: • Installing exhaust noise silencers on existing and future Metrolinx diesel locomotives, which will decrease the sound from these trains by an estimated 3 dB at all properties along the corridors. • Where possible, using 6-car rather than 12-car trains during off-peak periods. • Using EMUs along the Stouffville and Kitchener corridors. • Reducing engine idling. • Grade separations, which reduce noise by avoiding deceleration, idling and acceleration by both road and rail transportation vehicles. • Improvements to tracks and switches to reduce vibration and noise. • Installation of ballast mats underneath new tracks and switches to reduce vibration. The largest reduction of potential noise increases will come from electrification on core segments of the network. The bulk of service increases will be delivered by electric trains, which are near silent at low speeds, starting or stopping, and when stopped. Prior to the commencement of construction, the contractor will be required to develop and submit a detailed Construction Noise Management Plan to Metrolinx. Also, a Communications and Complaints Protocol will be developed by the contractor, which will indicate how and when surrounding local businesses and property owners/tenants will be informed of anticipated upcoming construction works (including work at night) and who they can contact should they have any concerns. Metrolinx has developed an Information Sheet on Construction Management that was prepared as part of the consultation materials presented in Round 1 (held February 2020). Please see the link below for further information: https://www.metrolinxengage.com/sites/default/files/info_sheet_6_-_construction_mgmt_-_final2.pdf.

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
28	Metrolinx Engage (Feedback Form)	Electrification Infrastructure	1. Do you have any questions or comments about this project that you would like clarified? In the drawing, I see that the terminus for the electrification is at Burlington station. However in previous documents the terminus for 15 minute service was to be Aldershot station. Have you changed the proposal for 15 minute two-way service? If not, how will Aldershot be included? Will there be transfers? Will trains serving Aldershot remain diesel? 2. Do you have any questions or comments about the findings presented in the materials, including the potential impacts and mitigation? I support the relocation of the layover facility to the proposed location east of Walkers' line. The Beach layover would have been incompatible with the city's planned Major Transit Station Area which should be the focal point for higher-density development in the future under the City and Region's new Official Plans. I am concerned about the location of the traction power station west of Cumberland Dr. The City of Burlington has planned to utilize this land for a trail connecting North and South Burlington. Will it still be possible for the City to construct this facility, which is an important part of the city's future active transportation network? Will Metrolinx be supporting the construction of a trail across this parcel of land? Link here: https://www.burlington.ca/en/services-for- you/resources/Initiative%20Pro... 3. Any other comments or advice you would like to share with the team? GO stations on Lakeshore West line need much greater connectivity with safe, protected connections for walking and biking, in order to take pressure off of the parking and facilitate growth of the Lakeshore West. These facilities need to be included in planning for all-day 15 minute service, and should include safe passage + wayfinding across the GO station properties in addition to on/off street connections to neighbourhoods. 4. Please provide an email if you would like our Community Relations team to follow up on your feedback.	The western termination point for electrified service along the Lakeshore West Corridor as documented in the 2017 GO Rail Network EPR was at Burlington GO Station. The portion of track between Burlington GO Station and Aldershot GO Station is owned by Canadian National Railway (CN Rail). Further discussions with CN Rail are required before electrified service beyond Burlington can be implemented. Diesel trains will service the portion of the Lakeshore West Corridor west of Burlington GO Station. Additional information regarding Metrolinx's new detailed service plan, presented as part of PIC #3 can be viewed at the following link: https://www.metrolinxengage.com/sites/default/files/goelectrification_service_level_plan.pdf Once electrification is implemented, Metrolinx will maintain a mixed fleet of both diesel and electric trains. It is important to note that diesel trains will still be able to operate along the electrified corridors, so passengers will not have to switch trains to continue traveling past the point of electrification. Thank you for your input. After receiving feedback from the public and stakeholders and completing additional studies, Metrolinx completed an options analysis to identify an alternate site to the previously proposed Beach Layover. This resulted in the identification of the Walkers Line Layover site which provides sufficient storage space to meet service requirements along the Lakeshore West rail corridor and provides many benefits compared to the Beach Layover location The Burlington Tap/Traction Power Substation (TPS) was previously assessed and approved as part of the 2017 GO Rail Network Electrification Transit Project Assessment Process (TPAP). The Tap/TPS will be located on Hydro One's existing Cumberland Transmission Station property. No further modifications to the site are being considered as part of the GO Rail Network Electrification Addendum. The Environmental Project Report (EPR) and supporting technical studies are available for review at: http://www.metrolinx.com/en/electrification/electric.aspx. It is noted that the City of Burlington was consulted as part of the 2017 TPAP and they are aware of the location of the Burlington Tap/TPS. The City continues to be engaged as part of the GO Rail Network Electrification Addendum. Any proposed use or impact to Hydro One's property or transmission corridor as a result of a proposed trail would be undertaken directly between the City of Burlington and Hydro One. Station upgrades are not within the scope of the GO Rail Network Electrification Addendum. Metrolinx is committed to providing the best access and connectivity to GO stations and our customers. For example, Metrolinx is currently undertaking upgrades to the existing Long Branch GO Station along the Lakeshore West Corridor. Enhancements include a new station building, improved access, new tunnels with stairs and elevators to platforms and provisions for two-way, all-day rail service. These enhancements are anticipated to be completed in 2023. For more information please visit: http://www.metrolinx.com/en/greaterregion/projects/longbranch-go.aspx

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
29	Metrolinx Engage (Feedback Form)	General	1. What do you like about GO Expansion? I love more options for public transit!! 2. Are there any specific features, sensitive locations and areas of interest that were not identified in the 2017 Electrification TPAP, that you feel should be addressed in this Electrification TPAP Addendum? Please do not impact green spaces like the Don. They are the best parts of Toronto and we need them not to be infringed upon. 3. For noise and vibration, are there any sensitive areas, neighbourhoods or locations that you feel have not been identified or sufficiently addressed in the assessments? The Don is the most majestic and sensitive parts of toronto. Please do not touch. 4. Do you have any questions about the one-time only Enhanced Noise Mitigation Program being offered? O 5. For air quality, are there any sensitive areas, neighborhoods or locations that you feel have not been identified or sufficiently addressed in the assessments? The Don! 6. Are there any mitigation measures for construction, operation and maintenance of the electrified GO rail network that you feel are missing? If so, do you have any suggestions for the Project Team? 7. Any other comments or advice you'd like to share with the team? Thanks for your work. Please don't touch the Don/taylor creek etc.	Thank you. Metrolinx is improving service as part of the GO Expansion Program by increasing train frequency and availability. The long-term goal and vision of the GO Expansion Program is to provide 15-minute two-way all-day service on core segments of the rail network. Electrification of the Richmond Hill Corridor is being assessed as part of the New Track & Facilities TPAP. This project also proposes a new layover facility within the Don Valley in the vicinity of the Prince Edward Viaduct. More information about the New Track and Facilities TPAP is available at the following location: https://www.metrolinxengage.com/en/engagement-initiatives/new-track-facilities-pic3 The proposed location for Don Valley Layover was made after consulting with the public and other stakeholders throughout 2020, and after completing a number of studies to assess potential impacts to the environment. The design has been revised since the second round of public consultation to reflect stakeholder feedback. Changes have been made to the site plan to use an already disturbed location to minimize any impact on the Don Valley, use already existing infrastructure so less new infrastructure needs to be built, relocate buildings to a higher elevation to floodproof the facility, and shift buildings away from the Lower Don Trail. A layover at this location is needed to reduce congestion at Union Station, which is a bottle-neck in the GO network. The proposed site is the only feasible location that will enable Metrolinx to achieve GO Expansion service targets that will result in greatly expanded transit opportunities for riders across the Greater Toronto and Hamilton Area. A thorough assessment of potential impacts to the natural environment has been completed and mitigation has been identified to avoid/offset these effects, as applicable. Specifically, a Natural Environment Impact Assessment was completed with the assistance of local municipalities and conservation authorities to ensure local conditions/concerns were appropriately identified and addressed. This report is available at the following link: https://www.metrolinxengage.com/sites/default/files/new_track_facilities_natural_environment_impact_assessment_report_draft.pdf. The Environmental Project Report for New Track and Facilities is now available for public review from December 30, 2020 to January 28, 2021. This report identifies anticipated environmental impacts and presents associated mitigation measures for all facets of the environment. No impacts to the Don River or Taylor Creek are anticipated as a result of the proposed electrification of the Richmond Hill Corridor or Don Valley Layover. All completed environmental and technical studies presenting anticipated impacts and associated mitigation measures are available for public review and comment at the following link: https://www.metrolinxengage.com/en/content/new-track-facilities-important-documents-0

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
30	Metrolinx Engage (Ask a Question)	General	Can Metrolinx seek international expertise? Since heavy-railway electrification never happened anywhere in Canada in recent past, Metrolinx may have a capability gap. Getting some advice from competent national railway authorities of France, Japan, India (doing 100% electrification currently), Germany etc. can certainly make it easier. This needs some inter-governmental cooperation that would be cheaper than hiring consulting firms. Too much protracted studies / reviews do not largely help with systemic efficiency as the construction cost goes up every year. Question: Has Metrolinx made attempts to learn from the other countries about how their national railways would go about electrification?	In 2010 as part of the GO Transit Electrification Study we reviewed several different types of technologies around the world. We examined the impact of different rail technologies used globally and involved a review and comparison of the power supply and power distribution options to deliver electrified rail service. This study created the basis of the GO Network Electrification TPAP now going through an addendum. We continue to work with global partners as our electrification teams have been working closely with networks in United Kingdom to understand and learn more about the implementation of electrification. The Metrolinx Technical Advisor for electrification is a global firm with extensive experience with rail systems in North America. North American examples are key in order to ensure a safe and efficient traction power system, as European systems differ in some areas. Also, it is important to note the proponents that are participating in the bidding process are made up of both global and local firms who are experienced in the design, construction and operation of electrified rail systems worldwide.

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
31	Metrolinx Engage (Ask a Question)	Electric Trains	Isn't it wrong to say "Electric trains run 29% faster"? Patricia Pytel, Metrolinx manager of Capital Communications, GO Rail Expansion wrote "Electric trains run up to 29 per cent faster..." All trains can run faster with appropriate signaling systems, even diesel trains. The current GO Rail system does not have adequate signaling to allow trains to run faster. The difference between an electric and diesel locomotive is not 29%. This is misleading and should be corrected. Trains will run faster when GO upgrades its signaling system. Isn't this so?	While we improve track and signal infrastructure to run better more reliable service, diesel propulsion still puts constraints on our system. Electric trains accelerate and slow down faster, while maintaining higher speeds better than heavy diesel locomotives. This results in trains and service that runs up to 29% faster. To achieve the speed and journey times needed to meet 15 minute two—way all day service on core segments, the GO Expansion program also includes grade separations, new track, and signal upgrades.

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
32	Metrolinx Engage (Feedback Form)	Enhanced Noise Mitigation	4. Do you have any questions about the one-time only Enhanced Noise Mitigation Program being offered? I have no idea what this is and there is nothing about it on your site. Please email me at with details.	The Significant Addendum to the 2017 GO Rail Network Electrification Environmental Project Report (EPR) is now being undertaken to assess additional electrification infrastructure required for new tracks and layover facilities (which are being studied as part of a separate Metrolinx study called "New Track & Facilities TPAP" and "Scarborough Junction Grade Separations TPAP") proposed across various portions of the GO rail network that were not previously examined as part of the 2017 Environmental Project Report (EPR). In addition, updated assessments of noise, vibration and air quality associated with increased service levels across six Metrolinx-owned rail corridors are also being undertaken. In addition to the new detailed service plan, four significant enhancements have been integrated into the 2021 noise, vibration and air quality assessment update: • Source-based noise mitigation measures, which are the most effective noise reduction measures and it reduces sound levels for all properties along Metrolinx rail corridors. • Fair distribution of proposed mitigation measures to maximize benefits. • Technical constructability, which is usually applied at a later design stage. • A maximum 7-metre noise barrier height could be considered where a 5-metre barrier height will not achieve the required noise reduction. More detailed information regarding the Noise and Vibration Assessment Update presented as part of PIC #3, including the Enhanced Noise Mitigation Program is available at the link below: https://www.metrolinxengage.com/en/content/go-rail-network-electrification-addendum-noise-vibration-and-air-quality-studies

5.3.4 GO Expansion / USRC Hydro One Conflicts Public Information Centre Update

Metrolinx hosted an additional round of public consultation online from February 2 to February 11, 2021 to provide additional information regarding the proposed scope of work within the USRC and surrounding areas associated with the Hydro One Conflicts, including upgrades to the existing/expanded and new Don Fleet Junction. **Figure 5-3** shows a screenshot of the Metrolinx Engage GO Rail Network Electrification Addendum page during PIC #3.

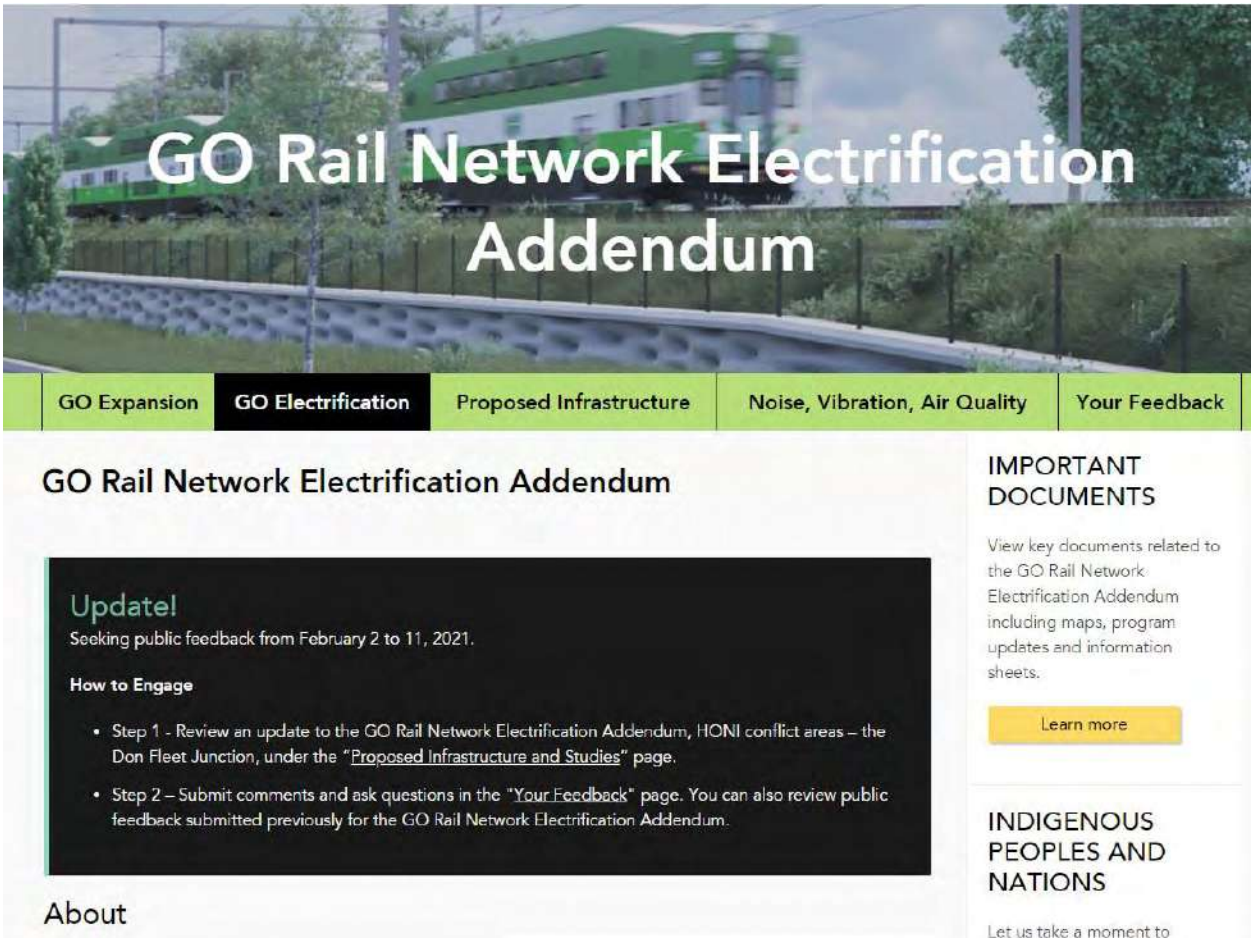

FIGURE 5-3: METROLINX ENGAGE GO RAIL NETWORK ELECTRIFICATION PAGE FOR PIC UPDATE

The information panels available online for review covered the following topics:

- Metrolinx Rail Corridor and Hydro One Conflict Areas
- Summary of Purposed Works within the USRC and Surrounding Areas
- Don Fleet Junction Scope of Work
- Don Fleet Junction Potential Effects and Proposed Mitigation Measures

5.3.4.1 Notice of Public Meeting

Metrolinx posted a Notice of Public Meeting to inform stakeholders of the opportunity to participate in the Public Meeting Update. This notice was posted on Facebook, Instagram and Twitter, as well as on Metrolinx-owned webpages such as Metrolinx News and the GOExpansion webpage.

Additional notification was distributed to Indigenous Nations and organizations, elected officials within the vicinity of the USRC Hydro One Conflicts Area, and other impacted stakeholders on the notification list.

These notices are included in **Appendix M2, Appendix M3, Appendix M8, and Appendix M11.**

5.3.4.2 Public Meetings Overview and Locations

As with the previous consultation efforts, all consultation activities were hosted on the Metrolinx Engage website as part of the Virtual Open House. The information on the webpage included a combination of all previously presented material in a manner that allows new participants to clearly understand the previous stages of the study.

The Electrification page included a page describing the project, a page containing information on proposed infrastructure, a page containing links to important documents (such as the Virtual Open House materials), a page providing information on System-Wide Operational Noise & Vibration and Air Quality Assessments (added as part of Round 3), and a page for the public to provide feedback on the project. An “Updated Information” section was added to the “Proposed Infrastructure” page that included some background information on the USRC Hydro One Conflicts Assessment, along with the information panels.

5.3.4.3 Summary of Attendance and Public Comments Received

As the Virtual Open House format for the Don Fleet Junction Update required that all participants use Metrolinx Engage to view materials, the majority of comments were received through Metrolinx Engage. While comment forms were used as part of this round of consultation, interested parties were still permitted to provide feedback through emails, letters, and phone calls. The EPR Addendum webpage received approximately 1,141 page views by 406 users.

Seven (7) questions and comments related to the USRC Hydro One Conflicts and Don Fleet Junction were received through the Ask-a-Question page, Feedback Forms, and the regional email account. Of these, four (4) Feedback Forms were submitted, one (1) question was posted on the Ask-a-Question page and two (2) emails were received. A summary of the general question and comment topics submitted on Metrolinx Engage are as follows:

- **Interest in anticipated timelines and construction schedules.** Some participants were interested to learn about the anticipated timeline for construction of the proposed works at the new and existing Don Fleet Junction and if there will be impacts on traffic and Active Transportation.
- **Scope of work and conflicts with other scheduled projects**. Some participants wanted to clarify the scope of work and confirm there will be no conflicts with other projects such as the Gardiner Expressway.
- **Concerns about infrastructure.** Several participants shared concerns about the OCS.

Table 5-6a Summarizes the key issues/comments/questions related to the USRC Hydro One Conflicts and Don Fleet Junction that were received from the public as part of the PIC Update, and how they were considered by Metrolinx.

TABLE 5-6a: SUMMARY OF PUBLIC CONSULTATION FOR DON FLEET JUNCTION UPDATE PUBLIC COMMENTS RECIEVED (FEBRUARY 2021)

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
1	Regional Email	General	Thank you for the information below regarding the update to the Don Fleet Junction, as part of the GO Rail Network Electrification Addendum. Please find attached to this email the information found on the Metrolinx website regarding the Don Fleet Junction Update. Can you please confirm whether this is the only information that Metrolinx is seeking feedback on at this time?	Thank you for your interest in the Union Station Rail Corridor (USRC) Hydro One Conflicts, including the proposed scope of work at the new and existing Don Fleet Junction. The USRC Hydro One conflicts scope of work includes the relocation of two (2) existing Hydro One overhead transmission circuits and one (1) existing Hydro One underground transmission circuit to an underground transmission corridor with the USRC, from Esplanade Transmission Station to Don Fleet Junction. Upgrades proposed at the new and existing Don Fleet Junction are required for the transition of circuits from the underground transmission corridor to overhead circuits. While existing overhead Hydro One infrastructure north of the Don Fleet Junction is outside of the scope of the current assessment, we will take your feedback and share it with the planning team for future consideration.
2	Email	Impact Assessment - Construction Impacts	Thank you for the opportunity to review technical documents relating to the GO Rail Network Electrification Addendum – Don Fleet Junction Update. We understand that several documents are in development and have yet to be published, among them (Impacts on) Socio-economic and land use. It is this document that most interests us as it outlines the physical environment in which the construction or expansion projects occur. In some cases, parks or recreation areas are affected, but this is rare, and tends to fall under discussions of impact of construction – noise, dust, vibration – or cases where trees must be removed in parks. In particular, we are interested in the impact of construction on Active Transportation (e.g. multi-use walking and cycle trails) that either run parallel to or bi-sect the construction areas. Previous TPAP assessments that we have reviewed have been diligent in identifying areas in which disruptions occur and workarounds or mitigation procedures. If electrification results in fewer disruptions than new construction of, for example, a layover, as it involves modifications to existing rail lines, such disruptions may not occur, or may occur less often. Above all, we would recommend outlining mitigation steps when disruptions occur. If there are no disruptions, please note these in the report. Likewise, if there are enhancements to active transportation in areas in which electrification occurs or will occur, please note these as well. Thank you again for the opportunity to review these documents and best wishes.	As a follow up to the earlier email, please see below for responses to your comments. The Land Use & Socio-Economic Impact Assessment related to the Don Fleet Junction is contained within Section 4.3.2.5 of the GO Rail Network Electrification EPR Addendum, which is to be circulated to stakeholders in the coming weeks. The GO Rail Network Electrification EPR Addendum documents that construction of the new and expanded Don Fleet Junction (JCT) has the potential to impact the Lower Don Trail. The location of potential impact is shown in the figure below: Since it is anticipated that the Lower Don Trail will be closed during construction due to public safety reasons, the following mitigation measures are recommended: • If possible, an alternative temporary detour will be provided for the duration of construction. • Metrolinx will coordinate internally and with the City of Toronto to develop a trail diversion/detour plan prior to construction and trail closure. • Fencing/gates will provide separation between Lower Don Trail users and construction activities. • If the Lower Don Trail is directly impacted due to construction activities, it will be rehabilitated and brought to current City standards. • Metrolinx will engage with the City of Toronto to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals. Nuisance effects may also be experienced by the public during construction, which are short-term effects that are difficult to prevent (e.x. noise, dust, etc.). The City of Toronto Parks, Forestry and Recreation Department and Ward Councillors will be notified prior to release of a public notice for construction. Mitigation measures related to potential nuisance effects are outlined in the Air Quality and Noise and Vibration commitment tables, and will be adhered to. Following construction, the Lower Don Trail will be re-opened for public use to maintain accessibility and connectivity within the City of Toronto and surrounding parklands. Permanent Durisol© walls will delineate the Don Fleet JCT from the Lower Don Trail, to ensure public safety and access to Hydro One infrastructure for approved personal only. Most vegetation within the USRC Hydro One Conflicts study area, specifically the new Don Fleet JCT and the Wilson Yard has been/will be permanently removed during construction of the Wilson Yard, as documented and approved in the 2018 USRC East Enhancements EPR. It is anticipated that any remaining vegetation within the USRC Hydro One Conflicts study area will be impacted during construction. Therefore, the following mitigation measures are proposed: • If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2020). Metrolinx will adhere to all applicable bylaws for tree removals outside of Metrolinx properties. • Pruning of branches will be conducted through the implementation of proper arboricultural techniques. • Prior to undertaking of tree removals, a Tree Removal Strategy, building upon the considerations and elements set out in the Metrolinx Vegetation Guideline (2020), will be developed and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections. • Vegetation removals will also consider and mitigate potential impacts to sensitive species, e.g., migratory birds and Species at Risk (SAR), and features, e.g., Designated Natural Areas and Significant Wildlife Habitat. Metrolinx is committed to continued consultation with the City of Toronto and TRCA. Thank you again for contacting us, your participation and feedback is an important part of our work. We look forward to your continued involvement with the Project.

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
3	Metrolinx Engage (Feedback Form)	Don Fleet Jct	Are there any specific features, sensitive locations and areas of interest associated with the Don Fleet Junction that you feel have not been addressed by the Electrification TPAP Addendum? Construction timeframe Are there any concerns or other impacts associated with the Don Fleet Junction that you'd like us to consider for the next stage of the project? Traffic anxiety Any comments or advice you'd like to share with the team? Anxiety	Thank you for your inquiry regarding the Don Fleet Junction Update currently live on Metrolinx Engage from February 2-February 11, 2021. Construction timelines for the USRC Hydro One Conflicts scope of work, including proposed works at the new and existing Don Fleet Junction will be confirmed during design validation. Currently, Metrolinx anticipates construction will commence in 2022 and will provide advance notification to the public once the schedule is confirmed The Don Fleet Junction scope of work is not anticipated to impact traffic on surrounding roadways. Construction of the Don Fleet Junction does however have the potential to impact pedestrian and cyclists along the Lower Don Trail. It is anticipated that the Lower Don Trail will be closed during construction due to public safety reasons, but a temporary detour will be provided for the duration of construction. Prior to beginning construction fences and gates will be installed to create separation between Lower Don Trail users and construction activities. Following construction, the Lower Don Trail will be re-opened for public use. Should you have any other questions regarding the project, please do not hesitate to ask.
4	Metrolinx Engage (Ask a Question)	Don Fleet Jct	Why can't the overhead transmission wires be buried? The overhead transmission wires should be buried from Don fleet junction as far north as possible to improve views in the don river valley and protect against extreme weather events (ice storms). The only reason this might not be possible is to due to the don river valley being a flood zone?	Thank you for your interest in the Union Station Rail Corridor (USRC) Hydro One Conflicts, including the proposed scope of work at the new and existing Don Fleet Junction. The USRC Hydro One conflicts scope of work includes the relocation of two (2) existing Hydro One overhead transmission circuits and one (1) existing Hydro One underground transmission circuit to an underground transmission corridor with the USRC, from Esplanade Transmission Station to Don Fleet Junction. Upgrades proposed at the new and existing Don Fleet Junction are required for the transition of circuits from the underground transmission corridor to overhead circuits. While existing overhead Hydro One infrastructure north of the Don Fleet Junction is outside of the scope of the current assessment, we will take your feedback and share it with the planning team for future consideration.
5	Metrolinx Engage (Feedback Form)	Don Fleet Jct	Are there any specific features, sensitive locations and areas of interest associated with the Don Fleet Junction that you feel have not been addressed by the Electrification TPAP Addendum? Are there any concerns or other impacts associated with the Don Fleet Junction that you'd like us to consider for the next stage of the project? Any comments or advice you'd like to share with the team? The design height of the roof of existing Bi-level vehicles is 15"11'. If an overhead catenary/solid contact wire is to be used in the confines of Union Station is there sufficient electrical clearance between: 1) the roof of such vehicles and the electrified conductor, and 2) the conductor and the train shed? Has any consideration been given to propelling Bi-level vehicles with electro-diesels as in Montreal and New Jersey?	Thank you for your inquiry regarding the Don Fleet Junction Update currently live on Metrolinx Engage from February 2-February 11, 2021. The overhead contact system to be used will be designed to applicable standards and code for clearance to safely accommodate the train shed roof, and all vehicles that will operate within the train shed. This includes existing and new bi-levels, and existing and new locomotives. The future train fleet will be a combination of new electric and existing diesel trains. The successful proponent will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of the GO Expansion Program. Should you have any other questions regarding the Project, please do not hesitate to ask.
6	Metrolinx Engage (Feedback Form)	Don Fleet Jct	Are there any specific features, sensitive locations and areas of interest associated with the Don Fleet Junction that you feel have not been addressed by the Electrification TPAP Addendum? Utility bridge at Cherry Street may affect plans to extend the 504 King streetcar line into the port lands. Are you in contact with Waterfront Toronto and TTC? Are there any concerns or other impacts associated with the Don Fleet Junction that you'd like us to consider for the next stage of the project? Will moving the hydro line underground conflict with City of Toronto plans to realign the eastern part of the Gardiner Expressway and create a new stormwater management pond in this area? Are you in contact with City Transportation Services? Any comments or advice you'd like to share with the team? It will be good to eliminate diesel fumes from the Union Station corridor where so many people live and work.	Thank you for your inquiry regarding the Don Fleet Junction Update currently live on Metrolinx Engage from February 2-February 11, 2021. Metrolinx is committed to ongoing engagement with stakeholders and is aware of the planned Waterfront LRT and Cherry streetcar line within the USRC. Following the TPAP Addendum and as part of design validation, Metrolinx will continue to consult with all applicable stakeholders. At this time, Metrolinx does not anticipate this project to impact City of Toronto realignment of the Gardiner Expressway. During the design validation process, Metrolinx will consult with all applicable stakeholders including the City of Toronto, Waterfront Toronto and TTC. Finally, thank you for the positive feedback regarding improving air quality within the Union Station Rail Corridor for residents. Metrolinx is committed to implementing electric rail service to improve air quality impacts from its trains. Therefore, Metrolinx is taking the following steps to reduce air emission from trains: • Electrify the system to the maximum extent possible. • Deliver most service with electric locomotives and EMUs. • Purchase only Tier-4 compliant equipment in the future, in addition to 17 Tier 4 locomotives already purchased. Tier 4 locomotives are the cleanest diesel technology currently available. • Rebuild existing diesel engines to Tier-4 standard at the first scheduled major rebuild.

ID	Source	Issue Category	Question/Comment	How Comment was Considered by Metrolinx
				• Use the "cleanest low-sulphur" diesel fuel. • Minimize diesel engine idling and restrict location of idling. • Minimize non-revenue train movements by locating train storage throughout the system. • Match train frequency and size to demand for minimizing energy consumption and emissions. • Provide training to operator and maintenance staff in energy efficiency practices. • Adhere to highest equipment maintenance standards. Thank you again for contacting us, your participation and feedback is an important part of our work. We look forward to your continued involvement with the Project.
7	Metrolinx Engage (Feedback Form)	Don Fleet Jct	Are there any specific features, sensitive locations and areas of interest associated with the Don Fleet Junction that you feel have not been addressed by the Electrification TPAP Addendum? No, I thought it comprehensive. Are there any concerns or other impacts associated with the Don Fleet Junction that you'd like us to consider for the next stage of the project? No, I thought it comprehensive. Any comments or advice you'd like to share with the team? I am very happy to hear that electrification is proceeding, and that high cost hydrogen has been eliminated as an option. Electrification will improve the commute and the air (and sound!) of GO Train lines to nearby neighbourhoods.	Acknowledged as received.

5.4 Indigenous Nations & Organizations Consultation

Consultation with Indigenous Nations and organizations was carried out in parallel with public and agency consultation activities. As part of the 2017 TPAP, Metrolinx submitted a request to the MECP Environmental Assessment and Approvals Branch (EAAB) on December 23, 2015 to assist in identifying potentially interested and affected Indigenous Nations and organizations as per the requirements of subsection 7(4) of the O.Reg. 231/08.

In 2018, Metrolinx made a commitment to building positive and meaningful relationships with Indigenous Peoples in alignment with its strategic objectives. The Indigenous Relations Office (IRO), established in 2019, has a mandate to build and grow relationships with Indigenous Nations, organizations, businesses and customer-residents. In 2020, the IRO became the sole point of contact for Indigenous Nations and supports the Environmental Programs & Assessment department to coordinate engagement and communication related to all Metrolinx projects. The IRO recognizes that in addition to the Nations listed who hold Aboriginal and Treaty rights, the Anishinabek Nation Union of Ontario Indians, and Association of Iroquois and Allied Indians represent Nations whose rights and interests may be impacted.

The following Indigenous Nations and organizations were identified as potentially affected or having interest in the GO Rail Network Electrification TPAP and were subsequently consulted as part of the Significant Addendum:

- Alderville First Nation;
- Beausoleil First Nation;
- Chippewas of Rama First Nation;
- Curve Lake First Nation;
- Hiawatha First Nation;
- Huron-Wendat Nation;
- Kawartha Nishnawbe First Nation;
- Mississaugas of the Credit First Nation;
- Mississaugas of Scugog Island First Nation;
- Moose Deer Point First Nation;
- Six Nations of the Grand River;
- Wahta Mohawks;
- Anishinabek Nation Union of Ontario Indians;
- Association of Iroquois and Allied Indians;
- Métis Nation of Ontario,
- Williams Treaties First Nations (WTFN); and,
- Haudenosaunee Confederacy Chiefs Council.

5.4.1 Notifications and Correspondence – Indigenous Nations & Organizations

Correspondence with Indigenous Nations and organizations began in February 2020. Each one identified in the Stakeholder Contact List was sent a letter through standard letter mail, as well as an identical email on February 6, 2020. This correspondence provided an introduction to the GO Expansion Program and the proposed scope of work, a list of all upcoming Round 1 Public Information Centres (location, date, and time of each meeting) and details of how they could reach out to Project staff should they have any questions or concerns, and/or wish to participate

in the consultation process. The notifications sent to those listed in **Table 5-7** all contained info on the Significant Addendum to the Electrification TPAP.

In addition to the notices below, Indigenous Nations and organizations were invited to provide comments on the Draft EPR Addendum along with other key stakeholders. Further details on the circulation of the Draft EPR Addendum are included in Section 5.8, and correspondence with Indigenous Nations and organizations related to the circulation are captioned in **Table 5-11**.

TABLE 5-7: CORRESPONDENCE PROVIDED TO INDIGENOUS NATIONS & ORGANIZATIONS

Community Name	Notice of PIC 1	Notice of PIC 2	Notice of PIC 3	Notice of PIC Update
Alderville First Nation	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Beausoleil First Nation	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Chippewas of Georgina Island First Nation	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Chippewas of Rama First Nation	Letter: Feb. 7, 2020 Email: Feb. 7, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Curve Lake First Nation	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Hiawatha First Nation	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Huron-Wendat Nation	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Kawartha Nishnawbe First Nation	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Mississaugas of the Credit First Nation	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Mississaugas of Scugog Island First Nation	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Moose Deer Point First Nation	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Six Nations of the Grand River	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Wahta Mohawks	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Anishinabek Nation Union of Ontario Indians	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Association of Iroquois and Allied Indians	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Métis Nation of Ontario	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Williams Treaties First Nations (WTFN)	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021
Haudenosaunee Confederacy Chiefs Council	Letter: Feb. 6, 2020 Email: Feb. 6, 2020	Email: Aug. 18, 2020	Email: Nov. 27, 2020	Email: Feb. 2, 2021

Copies of letters provided to Indigenous Nations & organizations are included in **Appendix M3**.

5.4.2 Summary of Indigenous Nations & Organizations Comments Received

Metrolinx received correspondence from Indigenous Nations as follows:

- Curve Lake First Nation;
- Huron Wendat Nation;
- Six Nations of the Grand River;
- Mississaugas of Scugog Island; and
- Chippewas of Rama First Nation.

Generally, the response from these Indigenous Nations indicated that they were interested in the Project and looked forward to being part of the consultation process. All the responding Nations wished to play a proactive role in the consultation process by setting up meetings with Metrolinx to discuss the Project. Common concerns for all of the Nations related to the potential impact the Project may have on culturally significant locations and the uncovering of burial sites. Summaries of the responses received by each Nation are provided below.

Huron-Wendat Nation

On February 6, 2020, Huron-Wendat Nation acknowledged the receipt of the project notification. The Huron-Wendat Nation reminded Metrolinx of Huron-Wendat Nation interests and how they want to be engaged. On August 4, 2020 Huron-Wendat Nation responded to the Draft EPR Addendum circulation by acknowledging receipt of the materials. On February 4, 2021, Huron-Wendat Nation acknowledged receipt of the Notice of PIC Update.

Curve Lake First Nation

On February 10, 2020, Curve Lake First Nation acknowledged the receipt of the project notification. Curve Lake First Nation notified Metrolinx that they would like Metrolinx to coordinate a meeting with them to discuss the project as well as other projects included under the GO Expansion Program. On April 14, 2020 a meeting was held with Curve Lake First Nation. Further details regarding the meeting are provided in Section 5.4.3.

Six Nations of the Grand River

On February 13, 2020, Six Nations of the Grand River acknowledged the receipt of the project notification. On August 4, 2020, Six Nations of the Grand River acknowledged receipt of the Draft EPR Addendum package and indicated that they would be interested in providing comments.

On September 17, 2020 Six Nations of the Grand River indicated via a letter the Nation's stance on Metrolinx projects, which was in response to the GO Rail Network Electrification project. They noted that due to the extremely large volume of reports and studies coming to Six Nations of the Grand River on Metrolinx projects, they did not have the resources or the capacity to be reading through each document. While this letter was received in response to the GO Rail Network Electrification EPR Addendum, it speaks to the broader relationship between Metrolinx and Six Nations of the Grand River and outlines the expectation of engagement and consultation broadly by the Nation.

Senior Management at Metrolinx have subsequently met with Six Nations of the Grand River and are currently reviewing this letter and preparing a response. This letter and response are

more broadly related to Metrolinx's overall practices, which includes the GO Rail Network Electrification project, but the response required is not specific to this project and will be addressed through the Indigenous Relations Office in coordination with Senior Management at Metrolinx.

Mississaugas of Scugog Island First Nation

On August 25, 2020 the Mississaugas of Scugog Island responded to the Draft EPR Addendum Circulation by confirming receipt of the materials and acknowledging that they had no comments to provide at this time.

Chippewas of Rama First Nation

On August 4, 2020 the Chippewas of Rama First Nation responded to the Draft EPR Addendum Circulation to acknowledge receipt and to note the difficulty in completing a comprehensive review in the provided timeframe. Metrolinx acknowledged their concerns and provided an extension to the comment period, as well as providing the opportunity to meet and discuss the project. A meeting was held on September 16, 2020, as detailed in Section 5.4.3.

5.4.3 Meetings with Indigenous Nations & Organizations

Huron-Wendat Nation

On November 13, 2019, a meeting was held between Metrolinx and the Huron Wendat Nation to provide a high-level summary of ongoing Metrolinx projects, including the GO Rail Network Electrification project.

Curve Lake First Nation

A meeting took place on April 14, 2020, where Metrolinx presented an overview of the GO Expansion Program, as well as the environmental assessments and network-wide studies currently underway. Another meeting was held on July 15, 2020 to provide an update on the GO Expansion Program, including the GO Rail Network Electrification Addendum.

Six Nations of the Grand River

On August 28, 2020, a meeting was held between Metrolinx and Six Nations of the Grand River to discuss Indigenous engagement best practices and concerns related to the GO Expansion program. Specific concerns were related to loss of vegetation, impacts to wildlife, and impacts to archaeological features. Metrolinx committed to provide information on Tree Removal Policies and to provide regular updates on Archaeological Assessments happening throughout the project study area. A second meeting was held on October 20, 2020 to provide updates on the Vegetation Removal Guidelines and discuss environmental monitoring, but specific discussions regarding the GO Rail Network Electrification were not held.

Chippewas of Rama First Nation

Following receipt of the GRT Review package, the Chippewas of Rama First Nation indicated that they would be interested in attending a meeting to discuss the project, along with additional concerns including adequate involvement in consultations. A meeting was held on September 16, 2020 to discuss the EPR Addendum, along with other aspects of the GO Expansion Program. Details were provided on the nature of rail electrification and the types of infrastructure that are involved, including OCS and TPFs, and how this would interact with existing train service (i.e. how CN and CP rail would operate on electrified tracks and if diesel trains will continue to see service). Questions were also asked about the extent of the program, and if electrification on Lakeshore West would continue to Hamilton. Clarification was provided that

electrification would only extend to Burlington Station. A commitment for a followup meeting to discuss consultation process and resource availability was agreed to.

5.4.4 Follow Up Efforts and Communications

In addition to the formal engagement outlined above, the Metrolinx Indigenous Relations Office contacted or communicated with Indigenous Nations on this project through the following means:

- Forecasting upcoming communication across all projects to each Nation on a monthly basis
- Providing regular email reminders regarding deadlines across all projects to each Nation on a monthly basis, on:
    - September 9, 2020; and
    - December 1, 2020.
- Receiving feedback and answering questions over the phone or during non-project specific meetings or engagements for:
    - Six Nations of the Grand River; and
    - Chippewas of Rama First Nation.

5.5 Property Owners Consultation

Metrolinx went beyond the recommended 30 metre requirement and sent mailers to property owners within 100 metres of the study area when issuing Notices for the following events:

- Public Meeting - Round1
- Public Meeting – Round 3
- Notice of EPR Addendum

Mailers were sent via Canada Post Smartmail Marketing Campaign. Over 312,000 addresses were included in the 100 metre study area mail out. Samples of the bulk mail notices are included in **Appendix M2.**

Metrolinx also contacted property owners with an identified impact as a result of the infrastructure proposed as part of the NT&F TPAP.

For the Notice as part of Public Meeting Round 2, property owners with potential property impacts arising from the Scarborough Junction Grade Separation TPAP and Stouffville Corridor Grade Separation TPAP study areas were sent notices as the second round of public consultations was heavily focused on these two projects.

For the Notice as part of Public Meeting Round 3, notices were only sent to property owners not previously contacted as part of the previous rounds of consultation, which only included properties affected as part of the NT&F TPAP and Network Wide Structures Project.

5.5.1 Property Owner Meetings

Some property requirements have been identified in association with infrastructure proposed as part of the NT&F TPAP. Electrification infrastructure, such as OCS pole foundations are anticipated to be contained within the property footprint requirements identified as part of the NT&F TPAP; as such, meetings with property owners were not specific to the 2017 GO Rail Network Electrification EPR Addendum, and are instead captioned in the NT&F EPR.

5.6 Review Agency Consultation

All review agencies on the Stakeholder Contact List were sent an email on January 30, 2020 notifying them of the first round of public meetings. The agencies identified were as follows:

Federal

- Canadian Environmental Assessment Agency;
- Canadian Transportation Agency;
- Crown-Indigenous Relations and Northern Affairs Canada;
- Environment and Climate Change Canada;
- Fisheries and Oceans Canada;
- Health Canada;
- Impact Assessment Agency of Canada;
- National Trust for Canada;
- Parks Canada; and

- Transport Canada.

Provincial

- Architectural Conservancy of Ontario;
- Central East LHIN;
- Central LHIN;
- Central West LHIN;
- Conservation Ontario;
- Infrastructure Ontario;
- Ministry of Agriculture, Food, and Rural Affairs;
- Ministry of Children, Community and Social Services;
- Ministry of Community Safety and Correctional Services;
- Ministry of Economic Development, Job Creation and Trade;
- Ministry of Education;
- Ministry of Energy, Northern Development and Mines;
- Ministry of Environment, Conservation and Parks;
- Ministry of Heritage, Sport, Tourism, and Culture Industries;
- Ministry of Indigenous Affairs
- Ministry of Municipal Affairs and Housing;
- Ministry of Natural Resources and Forestry;
- Ministry of Transportation;
- North Simcoe Muskoka LHIN;
- Ontario Growth Secretariat
- Ontario Heritage Trust; and
- Ontario Provincial Police.

Municipal

- City of Barrie;
- City of Brampton;
- City of Burlington
- City of Markham;
- City of Mississauga;
- City of Oshawa;
- City of Pickering;
- City of Toronto;
- City of Vaughan;

- County of Simcoe;
- Region of Durham;
- Region of Halton;
- Region of Peel;
- Region of York;
- Town of Ajax;
- Town of Aurora;
- Town of Bradford/West Gwillimbury;
- Town of East Gwillimbury;
- Town of Innisfil;
- Town of Newmarket;
- Town of Oakville;
- Town of Whitby;
- Town of Whitchurch-Stouffville; and
- Township of King.

Conservation Authorities

- Conservation Halton (CH);
- Credit Valley Conservation (CVC);
- Lake Simcoe Region Conservation Authority (LSRCA);
- Central Lake Ontario Conservation Authority (CLOCA); and
- Toronto and Region Conservation Authority (TRCA).

Other Stakeholders

- Toronto Transit Commission;
- VIA Rail;
- Greater Toronto Airports Authority;
- Canadian Pacific Rail;
- The Canadian National Railway Company;
- NavCanada;
- Canada Lands Company;
- Architectural Conservancy of Ontario;
- Toronto Lands Corporation; and
- Waterfront Toronto.

The Stakeholder Contact List and copies of notifications sent to review agencies are included in **Appendix M1** and **Appendix M3** respectively.

5.6.1 Federal

Metrolinx has worked to coordinate reviews of key items with Federal Agencies where possible. A number of Federal Agencies have been notified of major project milestones and will remain on the Stakeholder Contact List unless they ask to be removed. It should be noted that no Federal Agencies provided questions/comments or requested to meet with the Project Team to discuss this project.

5.6.2 Provincial

5.6.2.1 Ministry of Transportation (MTO)

A meeting was held with the MTO on September 16, 2019 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented. Metrolinx noted that there have been changes to the requirements to meet GO Expansion service levels since the completion of the 2017 GO Rail Network Electrification TPAP, and that the NT&F TPAP (along with the other projects within the GO Expansion Program) are required to meet these targets.

5.6.2.2 Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)

Following the circulation of the Draft EPR Addendum, additional details and studies became available regarding the assessment of USRC Hydro One Conflicts. Prior to the Notice of EPR Addendum, information was shared with MHSTCI and further correspondence was undertaken. On September 23, 2020, Metrolinx requested that MHSTCI review the following draft HIAs and provide comments:

- Cherry Street Subway, PHP (Union Station Rail Corridor);
- Sherbourne St. Subway, PHP (Union Station Rail Corridor);
- Parliament St. Subway, PHP (Union Station Rail Corridor).

A Cultural Heritage Report (CHR) was also prepared separately for the USRC Hydro One Conflicts scope of work, which was shared with MHSTCI on October 27, 2020. Comments on all four (4) reports were received on December 12, 2020.

Prior to the start of the formal 30-day public review period of the EPR Addendum, a pre-notice was circulated to MHSTCI on January 22, 2021 that contained Sections 1 & 2 of the EPR Addendum, along with select impact assessment reports. The purpose of this pre-notice was to allow for additional time to review the documents in advance of the 30-day public review period.

A record of the comments provided by MHSTCI on the HIAs and CHR and Metrolinx's response are included in **Appendix M10.** Comments provided by MHSTCI as part of the circulation of the Draft EPR Addendum are included in **Table 5-15**.

5.6.2.3 Ministry of the Environment, Conservation and Parks

Prior to the start of the formal 30-day public review period of the EPR Addendum, a pre-notice was circulated to MECP on January 22, 2021 that contained Sections 1 & 2 of the EPR Addendum, along with select impact assessment reports. The purpose of this pre-notice was to allow for additional time to review the documents in advance of the 30-day public review period.

5.6.3 Municipal

5.6.3.1 City of Markham

Metrolinx acknowledges that the City of Markham passed a council motion in September 2020 objecting to the proposed location of the Unionville Storage Yard as proposed withing the NT&F TPAP. On January 28, 2021 a response was provided to the City of Markham outlining the need for the facility, highlighting the discussions that have occurred with TRCA, and providing an overview of the assessed impacts and property requirements. A copy of this letter is included in **Appendix M9.**

5.6.3.2 City of Toronto

Following the circulation of the Draft EPR Addendum, additional EPR Addendum content and study results became available regarding the assessment of USRC Hydro One Conflicts, which was shared with the City of Toronto on October 5, 2020 for review and comment (the draft USRC Hydro One Conflicts Significant Addendum Memorandum). It is noted that the following HIAs had been provided to the City of Toronto for review and comment on September 18, 2020:

- Cherry Street Subway, PHP (Union Station Rail Corridor);
- Sherbourne St. Subway, PHP (Union Station Rail Corridor);
- Parliament St. Subway, PHP (Union Station Rail Corridor).

Comments on the HIAs were provided to Metrolinx on October 19, 2020, while comments on the draft USRC Hydro One Conflicts Significant Addendum Memorandum were provided to Metrolinx on November 3, 2020.

Prior to the start of the formal 30-day public review period of the Final EPR Addendum, a pre-notice was circulated to the City of Toronto that contained Sections 1 & 2 of the EPR Addendum, along with select impact assessment reports. The purpose of this pre-notice was to allow for additional time to review the documents in advance of the 30-day public review period.

A record of the comments provided by the City of Toronto and Metrolinx's response are included in **Appendix M9.** Comments provided by the City as part of the circulation of the Draft EPR Addendum are included in **Table 5-23**.

5.6.3.3 Municipal Technical Advisory Committees

Municipal Technical Advisory Committees (TACs) were established to bring together municipal and regional staff with knowledge of the local environment and infrastructure, so that they could be consulted with on important matters related to Metrolinx projects within their respective jurisdictions. While the primary purpose of these consultations was to discuss the NT&F TPAP, other Metrolinx projects within the GO Expansion Program were included in discussions, including the Significant Addendum to the Electrification EPR and the USRC Hydro One Conflicts Assessment. A full list of these TAC Meetings is provided in **Table 5-8:**.

TABLE 5-8: TECHNICAL ADVISORY COMMITTEE (TAC) MEETINGS

Title of TAC	Meeting #	Municipalities in Attendance	Date of Meeting
York - Aurora TAC	TAC #1	• Town of Aurora • City of Vaughan • Town of Newmarket	May 22, 2019
York - Aurora TAC	TAC #2	• Town of Aurora	December 11, 2019
Simcoe TAC	TAC #1	• City of Barrie • County of Simcoe	October 18, 2019
Durham TAC	TAC #1	• Region of Durham • City of Pickering • City of Oshawa • Town of Whitby	July 4, 2019
Durham TAC	TAC #2	• Region of Durham • City of Pickering • City of Oshawa • Town of Whitby	November 1, 2019
Durham TAC	TAC #3	• Durham Region • City of Oshawa • Town of Whitby • Central Lake Ontario Conservation Authority (CLOCA)	July 29, 2020
Halton TAC	TAC #1	• Region of Halton • Town of Oakville • City of Burlington	May 15, 2019
Halton TAC	TAC #2	• Region of Halton • Town of Oakville • City of Burlington • Conservation Halton	October 22, 2019
Halton TAC	TAC #3	• Region of Halton • Town of Oakville • City of Burlington • Conservation Halton	June 18, 2020
Halton TAC	TAC #4	• City of Burlington	December 4, 2020
York - King TAC	TAC #1	• Region of York • Township of King	May 24, 2019
York - Markham TAC	TAC #1	• Region of York • City of Markham	May 13, 2019
York - Markham TAC	TAC #2	• Region of York • City of Markham	January 31, 2020
City of Toronto TAC	TAC #1	• City of Toronto	August 16, 2019
City of Toronto TAC	TAC #2	• City of Toronto	October 9, 2019
City of Toronto TAC	TAC #3	• City of Toronto	December 12, 2019
City of Toronto TAC	TAC #4	• City of Toronto	February 12, 2020
City of Toronto TAC	TAC #5	• City of Toronto	May 6, 2020
City of Toronto TAC	TAC #6	• City of Toronto • TRCA	June 4, 2020
City of Toronto TAC	TAC #7	• City of Toronto • TRCA	August 18, 2020

Title of TAC	Meeting #	Municipalities in Attendance	Date of Meeting
Toronto - Hydro One TAC	TAC #1	• City of Toronto • Hydro One	October 8, 2020
Toronto - Hydro One TAC	TAC #2	• City of Toronto • Hydro One	November 26, 2020
Toronto - Hydro One TAC	TAC #3	• City of Toronto • Hydro One	January 19, 2021

Although the general content was similar for all the municipal meetings, each meeting was tailored to meet the specific concerns of each municipality. The following is a list of meetings in which matters related to electrification were specifically discussed, along with a description of these discussions.

5.6.3.3.1 York-Aurora TAC Meeting #1

A meeting was held with the Town of Aurora, City of Vaughan, and Town of Newmarket on May 22, 2019 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.3.3.2 York-Aurora TAC Meeting #2

A meeting was held with the Town of Aurora on December 11, 2019 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.3.3.3 Simcoe TAC Meeting #1

A meeting was held with the County of Simcoe and the City of Barrie on October 18, 2019 to provide an overview of the NT&F TPAP and associated projects. During the meeting, high-level information related to the implementation of electrification was presented, including diagrams and descriptions of the OCS infrastructure.

5.6.3.3.4 Durham TAC Meeting #1

A meeting was held with the City of Pickering, Region of Durham, City of Oshawa, and the Town of Whitby on July 4, 2019 to provide an overview of the GO Expansion Program, NT&F TPAP, and associated projects. During the meeting, information was presented on the Thickson Road widening, including information on how this project will interact with electrification. Since the railway passes over the road, it was noted that there is no requirement for flash plates or OCS attachments underneath the bridge. The current design concept indicates the span between OCS poles is great enough that they can be placed on either side of the bridge. Information on bridge barriers, OCS attachments, vertical clearance, and other bridge modifications associated with electrification was also presented.

5.6.3.3.5 Durham TAC Meeting #2

A meeting was held with the City of Pickering, Region of Durham, City of Oshawa, and the Town of Whitby on November 1, 2019 to provide updates on the information presented July 4, 2019, including the Thickson Road widening.

5.6.3.3.6 Durham TAC Meeting #3

The Region of Durham, City of Oshawa, Town of Whitby and CLOCA were invited to attend this meeting, held on July 29, 2020. The primary purpose of this meeting was to discuss NT&F

infrastructure within the Region of Durham, the Bowmanville Expansion Project, and the Thickson Road Bridge expansion. Some high-level discussions related to the implementation of electrification occurred.

5.6.3.3.7 Halton TAC Meeting #1

A meeting was held with the City of Burlington, Region of Halton, and the Town of Oakville on May 15, 2019 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.3.3.8 Halton TAC Meeting #2

A meeting was held with the City of Burlington, Region of Halton, Conservation Halton, and the Town of Oakville on October 22, 2019 to provide an overview of the GO Expansion Program, NT&F TPAP, and associated projects. The impact of OCS infrastructure on surface drainage and a creek near Oakville GO Station was discussed, and it was noted that OCS foundations will be located entirely within the existing rail ROW.

5.6.3.3.9 Halton TAC Meeting #3

This meeting was held with the City of Burlington, Region of Halton, Conservation Halton, and the Town of Oakville on June 18, 2020. Metrolinx provided an overview on final Beach Layover facility Reference Concept Design (RCD); new potential layover site introduced (Walkers Line); status of Draft NT&F EPR that was circulated on April 27, 2020; status of final Impact Assessment Reports; and upcoming Round Two of public consultation, which will be a virtual online engagement.

5.6.3.3.10 Halton TAC Meeting #4

A meeting was held with the City of Burlington on December 4, 2020 to provide an updated site plan for the proposed Walkers Line Layover. This included a discussion of the electrification infrastructure required for the layover facility.

5.6.3.3.11 York-King TAC Meeting #1

A meeting was held with the Region of York and the Township of King on May 24, 2019 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.3.3.12 York-Markham TAC Meeting #1

A meeting was held with the Region of York and the City of Markham on May 13, 2019 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.3.3.13 York-Markham TAC Meeting #2

A meeting was held with the Region of York and the City of Markham on January 31, 2020 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.3.3.14 Toronto TAC Meeting #1

A meeting was held with the City Toronto on August 16, 2019 to provide an overview of the GO Expansion Program, with a specific focus on new infrastructure proposed within the City of Toronto. The meeting also provided an overview of the Significant Addendum to the

Electrification EPR and provided City staff with the opportunity to comment on electrification infrastructure, including bridge barriers and OCS attachments.

5.6.3.3.15 Toronto TAC Meeting #2

A meeting was held with the City Toronto on October 9, 2019 to provide an update of activities completed since the last TAC meeting for the NT&F TPAP and other GO Expansion Programs. During the meeting, discussions were held regarding the impacts of electrification infrastructure (OCS attachments and barriers) on future bridge maintenance. The project team confirmed that the GO Expansion Project Co. will be responsible for the maintenance of this infrastructure, including the cleaning of transparent barrier panels. The project team also confirmed that the GO Expansion Project Co. will be assessing the structural integrity of bridge components to ensure that they can handle the attachment of new infrastructure, and any reinforcement/repairs associated with these structures will be handled by them as well.

5.6.3.3.16 Toronto TAC Meeting #3

A meeting was held with the City Toronto on December 12, 2019 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.3.3.17 Toronto TAC Meeting #4

A meeting was held with the City Toronto on February 12, 2020 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.3.3.18 Toronto TAC Meeting #5

A meeting was held with the City Toronto on May 6, 2020 to discuss the GO Expansion Program, with a primary focus on impacts related to the Don Valley Layover facility. During the meeting, high-level information related to the Electrification Addendum was presented, including upcoming consultation activities.

5.6.3.3.19 Toronto TAC Meeting #6

A meeting was held with the City Toronto and TRCA on June 4, 2020 to discuss the GO Expansion Program, with a primary focus on impacts related to the Don Valley Layover facility. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.3.3.20 Toronto TAC Meeting #7

A meeting was held with the City Toronto and TRCA on August 18, 2020 to discuss the GO Expansion Program, with a primary focus on impacts related to the Don Valley Layover facility. During the meeting, high-level information related to the Electrification Addendum was presented, including upcoming consultation activities and the layout of the virtual consultation activities.

5.6.3.3.21 Toronto - Hydro One TAC Meeting #1

A meeting was held with Hydro One and the City of Toronto on October 8, 2020 to discuss the USRC Hydro One Conflicts scope of work, including the HIAs completed for the USRC bridges and the proposed utility bridges required for the project. Metrolinx agreed to provide the City with more information on the proposed transmission structure, and the City agreed to provide further information on the heritage abutments associated with the original Don River crossing.

Metrolinx agreed to further review the information the City provided to confirm any further impacts, and agreed to make revisions to publicly presented information for the next round of consultation.

5.6.3.3.22 Toronto - Hydro One TAC Meeting #2

A meeting was held with Hydro One and the City of Toronto on November 26, 2020 to further discuss the USRC Hydro One Conflicts scope, including the addition of a steel monopole structure (which is outside of the scope of this EPR Addendum). An update was also provided on the work at the Don Fleet Junction, and discussions were held related to the finalization of the EPR Addendum document and coordination with TRCA.

5.6.3.3.23 Toronto – Hydro One TAC Meeting #3

A meeting was held with Hydro One and the City Toronto on January 19, 2021 to discuss the USRC Hydro One Conflicts scope, including providing updates on the work at the Don Fleet Junction. Most of the discussions held were related to the design of the Wilson Yard and the steel monopole structure, which are outside the scope of the EPR Addendum. Information related to the upcoming PIC Update was also shared at the time.

5.6.4 Conservation Authorities

5.6.4.1 Toronto Region Conservation Authority (TRCA)

A meeting was held with the TRCA on July 25, 2019 to discuss the GO Expansion Program. During the meeting, information related to the Electrification Addendum progress (including consultation timelines) was presented along with information on the Unionville Storage Yard.

A second meeting was held with the TRCA on January 21, 2020 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

Prior to the start of the formal 30-day public review period for the EPR Addendum, a pre-notice was circulated to TRCA on January 22, 2021 that contained Sections 1 & 2 of the EPR Addendum, along with select impact assessment reports. The purpose of this pre-notice was to allow for additional time to review the documents in advance of the 30-day public review period.

5.6.4.2 Conservation Halton (CH)

A meeting was held with CH on August 19, 2019 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.5 Other Stakeholders

5.6.5.1 Lakeshore East Community Advisory Committee (CAC)

A meeting was held with the Lakeshore East CAC on May 13, 2020 to discuss the GO Expansion Program and the Ontario Line. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.5.2 Aurora Town Park Area Ratepayers Association

A meeting was held with the Aurora Town Park Ratepayers Association on October 8, 2020 to discuss the GO Expansion Program, Aurora GO Station upgrades, Wellington Street Grade Separation, and the Bloomington GO Station. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.5.3 Aurora Baywell Community Ratepayers Association

A meeting was held with the Aurora Baywell Community Ratepayers Association on October 13, 2020 to discuss the GO Expansion Program, Aurora GO Station upgrades, Wellington Street Grade Separation, and the Bloomington GO Station. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.5.4 Keller Williams Barrie

A meeting was held with Keller Williams Barrie on October 13, 2020 to discuss the GO Expansion Program, Bradford Station upgrades, and the proposed Innisfil GO Station. During the meeting, high-level information related to the Electrification Addendum was presented.

5.6.5.5 Hydro One

Prior to the start of the formal 30-day public review period for the EPR Addendum, a pre-notice was circulated to Hydro One on January 22, 2021 that contained Sections 1 & 2 of the EPR Addendum, along with select impact assessment reports. The purpose of this pre-notice was to allow for additional time to review the documents in advance of the 30-day public review period.

5.6.5.6 Waterfront Toronto

Following the circulation of the Draft EPR Addendum, additional EPR Addendum content and study results became available regarding the assessment of USRC Hydro One Conflicts, which was shared with Waterfront Toronto on November 6, 2020 for review and comment. It is noted that the following HIAs had been provided to Waterfront Toronto for reference:

- Cherry Street Subway, PHP (Union Station Rail Corridor);
- Sherbourne St. Subway, PHP (Union Station Rail Corridor);
- Parliament St. Subway, PHP (Union Station Rail Corridor).

Comments were provided to Metrolinx on November 24, 2020.

Prior to the start of the formal 30-day public review period for the EPR Addendum, a pre-notice was circulated to Hydro One on January 22, 2021 that contained Sections 1 & 2 of the EPR Addendum, along with select impact assessment reports. The purpose of this pre-notice was to allow for additional time to review the documents in advance of the 30-day public review period.

A record of the comments provided by Waterfront Toronto and Metrolinx's response are included in **Appendix M10.**

5.7 Elected Officials Consultation

All elected officials whose electoral riding intersected with the Study Area were sent a briefing package that included a notice of the first round of public meetings on and between December 20, 2019 and February 4, 2020. The package also invited officials to contact the Project Team if they wished to schedule a meeting with Project staff. A second briefing package that included a notice of the second round of virtual open houses was sent via email to select elected officials between May 29, 2020 and August 10, 2020. The notice for the third round of virtual open houses was distributed the week of November 23, 2020. Elected officials were asked to help promote the public meetings and virtual open houses by distributing the notice to their

constituents. The email invited elected officials to contact the Project Team if they wish to schedule a meeting. Below is a summary of comments received and meetings that took place.

A list of elected officials contacted is included in **Table 5-9** and **Table 5-10** and copies of briefing packages and a copy of all elected officials' correspondence and meeting materials are included in **Appendix M11**.

Briefing packages included an overview of the following:

- GO Expansion Program;
- GO Expansion Program infrastructure requiring EA approval;
- New Track and Facilities Project;
- New Track and Facilities TPAP: Lakeshore West Corridor;
- New Track and Facilities TPAP: Lakeshore West Corridor;
- New Track and Facilities anticipated property impacts;
- Metrolinx Integrated Vegetation Management (IVM) Strategy;
- Tree Removal Strategy;
- GO Expansion Program – Revised Noise and Vibration and Air Quality studies;
- Anticipated TPAP timeline; and
- Public consultation approach.

TABLE 5-9: SUMMARY OF ISSUED BRIEFING PACKAGES FROM THE FIRST ROUND OF PUBLIC CONSULTATION

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
City of Barrie	Andrea Khanjin	MPP	Barrie-Innisfill	January 14, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Barrie	Jim Harris	Councillor	Ward 8	February 04, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Burlington	Jane McKenna	MPP	Burlington	January 8, 2020	• New Track & Facilities TPAP • Vegetation Removal and Compensation Program

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
City of Burlington	Lisa Kearns	Councillor	Ward 2	January 8, 2020	• New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Markham	Isa Lee	Councillor	Ward 8	December 20, 2019	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Markham	Reid McAlpine	Councillor	Ward 3	December 20, 2019	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Markham	Andrew Keyes	Councillor	Ward 5	December 20, 2019	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Oshawa	John Gray	Councillor	Ward 5	January 7, 2020	• New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Oshawa	Brian Nicholson	Councillor	Ward 5	January 7, 2020	• New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Toronto	Jim Karygiannis	Councillor	Ward 22 Scarborough-Agincourt	January 14, 2020	• Stouffville Grade Separations TPAP • Vegetation Removal and Compensation Program
City of Toronto	Jessica Bell	MPP	University-Rosedale	January 14, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
					• Vegetation Removal and Compensation Program
City of Toronto	Suze Morrison	MPP	Toronto-Centre	January 14, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Toronto	Mike Layton	Councillor	Ward 11 University-Rosedale	January 14, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Toronto	Michael Thompson	Councillor	Ward 21 Scarborough-Centre	January 14, 2020	• Stouffville Grade Separations TPAP • Vegetation Removal and Compensation Program
City of Toronto	Aris Babikian	MPP	Scarborough-Agincourt	January 14, 2020	• Stouffville Grade Separations TPAP • Vegetation Removal and Compensation Program
City of Toronto	Marilyn Iafrate	Councillor	Vaughan Ward 1	January 14, 2020	• Electrification EPR Addendum • Vegetation Removal and Compensation Program • Significant EA Addendum to Barrie Expansion TPAP (2017)
City of Toronto	Sandra Yeung Racco	Councillor	Ward 4	January 14, 2020	• Vegetation Removal and Compensation Program • Significant EA Addendum to Barrie Expansion TPAP (2017)
City of Toronto	Dolly Begum	MPP	Scarborough-Southwest	January 14, 2020	• Scarborough Junction Rail/Rail

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
					Grade Separation TPAP • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Toronto	Christina Maria Mitas	MPP	Scarborough-Centre	January 14, 2020	• Vegetation Removal and Compensation Program • Stouffville Grade Separations TPAP
City of Toronto	Raymond Sung Joon Cho	MPP	Scarborough-North	January 14, 2020	• Vegetation Removal and Compensation Program • Stouffville Grade Separations TPAP
City of Toronto	Peter Tabuns	MPP	Toronto-Danforth	January 14, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Toronto	Kathleen O. Wynne	MPP	15 Don Valley West	January 14, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
City of Toronto	Gary Crawford	Councillor	Ward 20 Scarborough-Southwest	January 08, 2020	• Scarborough Junction Rail/Rail Grade Separation TPAP • New Track and Facilities TPAP • Vegetation Removal and Compensation Program
City of Toronto	Paula Fletcher	Councillor	Ward 14 Toronto-Danforth	January 14, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
					Compensation Program
City of Toronto	Kristyn Wong-Tam	Councillor	Ward 13 Toronto-Centre	January 14, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
Town of Aurora	Tom Mrakas	Mayor	Barrie-Innisfill	January 14, 2020	• Significant EA Addendum to Barrie Corridor Expansion TPAP (2017) • New Track & Facilities TPAP • Vegetation Removal and Compensation Program
Town of Oakville	Stephen Crawford	MPP	Oakville	January 8, 2020	• New Track & Facilities TPAP • Vegetation Removal and Compensation Program
Town of Oakville	Dave Gittings	Regional Councillor	Ward 3	January 8, 2020	• New Track & Facilities TPAP • Vegetation Removal and Compensation Program
Town of Oakville	Janet Haslett-Theall	Councillor	Ward 3	January 8, 2020	• New Track & Facilities TPAP • Vegetation Removal and Compensation Program
Town of Whitby	Maleeha Shahid	Councillor	Ward 4	January 7, 2020	• New Track & Facilities TPAP • Vegetation Removal and Compensation Program
Town of Whitby	Steve Yamada	Councillor	Ward 4	January 7, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Removal and Compensation Program

TABLE 5-10: SUMMARY OF ISSUED BRIEFING PACKAGES FROM THE SECOND ROUND OF PUBLIC MEETINGS

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
-	Doug Ford	Ontario Premier		August 18, 2020	• General invitation to participate in consultation
City of Vaughan	Sandra Yeung Racco	Councillor	Ward 4	May 29, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP
City of Toronto	Brad Bradford	Councillor	Ward 19	June 8, 2020	• Electrification EPR Addendum • System-Wide Noise & Vibration Study
City of Toronto	Jennifer McKelvie	Councillor	Ward 25	August 13, 2020	• General invitation to participate in consultation
City of Toronto	Paul Ainslie	Councillor	Ward 24	August 13, 2020	• General invitation to participate in consultation
City of Toronto	Cynthia Lai	Councillor	Ward 23	August 13, 2020	• General invitation to participate in consultation
City of Toronto	Mike Layton	Councillor	Ward 11	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Stan Cho	MPP	Willowdale	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Christina Mitas	MPP	Scarborough Centre	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Aris Babikan	MPP	Scarborough-Agincourt	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Doly Begum	MPP	Scarborough Southwest	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Kathleen Wynne	MPP	Don Valley West	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Suze Morrison	MPP	Toronto Centre	August 11, 2020	• General invitation to participate in consultation

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
City of Toronto	Chris Glover	MPP	Spadina-Fort York	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Jessica Bell	MPP	University-Rosedale	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Michael Thompson	Councillor	Ward 21	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Jim Karygiannis	Councillor	Ward 22	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Paula Fletcher	Councillor	Ward 14	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Gary Crawford	Councillor	Ward 20	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Josh Matlow	Councillor	Ward 12	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Shelley Carroll	Councillor	Ward 17	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Denzil Minnan-Wong	Councillor	Ward 16	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Jaye Robinson	Councillor	Ward 15	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Paula Fletcher	Councillor	Ward 14	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Kristyn Wong-Tam	Councillor	Ward 13	August 11, 2020	• General invitation to participate in consultation
City of Toronto	Joe Cressy	Councillor	Ward 10	August 11, 2020	• General invitation to participate in consultation
City of Toronto	John Tory	Mayor		August 11, 2020	• General invitation to participate in consultation
City of Toronto	Michael Ford	Councillor	Ward 1	August 18, 2020	• General invitation to participate in consultation

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
City of Barrie	Jim Harris	Councillor	Ward 8	August 10, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Compensation Program
City of Barrie	Natalie Harris	Councillor	Ward 6	August 10, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Compensation Program
Town of Aurora	Tom Mrakas	Mayor	Barrie-Innisfil	August 10, 2020	• New track infrastructure (Network-wide) • Vegetation Compensation Program • Wellington Street / Rail Grade Separation, Aurora
City of Barrie	Andrea Khanjin	MPP	Barrie-Innisfil	August 10, 2020	• GO Electrification EPR Addendum • New track infrastructure (Network-wide) • Vegetation Compensation Program
Town of Aurora	Christine Elliott	Deputy Premier	Aurora Newmarket	August 10, 2020	• Electrification EPR Addendum • New Track & Facilities TPAP • Vegetation Compensation Program • Wellington Street / Rail Grade Separation, Aurora
City of Vaughan / Township of King	Stephen Lecce	MPP	Vaughan King	August 10, 2020	• Electrification EPR Addendum • Vegetation Compensation Program • McNaughton Road/ Rail Grade Separation, Vaughan

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
City of Vaughan	Sandra Yeung Racco	Councillor	Ward 4	August 10, 2020	• Vegetation Compensation Program • McNaughton Road/ Rail Grade Separation, Vaughan
City of Markham	Andrew Keyes	Councillor	Ward 5	August 10, 2020	• New Track Infrastructure (Network Wide)
City of Markham	Isa Lee	Councillor	Ward 8	August 10, 2020	• GO Electrification EPR Addendum • Vegetation Compensation Program • New Track Infrastructure (Network Wide) • Stouffville Grade Separation TPAP o Kennedy Road o Denison Street
City of Markham	Billy Pang	MPP	Markham- Unionville	August 10, 2020	• GO Electrification EPR Addendum • Vegetation Compensation Program • Unionville Storage Facility (STVL) • New Track Infrastructure (Network Wide)
City of Markham	Logan Kanapathi	MPP	Markham- Thornhill	August 10. 2020	• GO Electrification EPR Addendum • Vegetation Compensation Program • New Track Infrastructure (Network Wide) • Stouffville Grade Separation TPAP o Kennedy Road o Denison Street

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
City of Markham	Paul Calandra	MPP	Markham- Stouffville	August 10, 2020	• New Track Infrastructure (Network-Wide)
City of Markham	Reid McAlpine	Councillor	Ward 3	August 10, 2020	• GO Electrification EPR Addendum • Vegetation Compensation Program • Unionville Storage Facility (STVL) • New Track Infrastructure (Network Wide)
City of Pickering	Shaheen Butt	Councillor	Ward 3	August 11, 2020	• General invitation to participate in consultation
City of Pickering	Kevin Ashe	Councillor	Ward 1	August 11, 2020	• General invitation to participate in consultation
City of Pickering	Bill Mclean	Councillor	Ward 2	August 11, 2020	• General invitation to participate in consultation
City of Pickering	David Pickles	Councillor	Ward 3	August 11, 2020	• General invitation to participate in consultation
City of Pickering	Maurice Brenner	Councillor	Ward 1	August 11, 2020	• General invitation to participate in consultation
City of Pickering	Ian Cumming	Councillor	Ward 2	August 11, 2020	• General invitation to participate in consultation
City of Pickering	David Ryan	Mayor		August 11, 2020	• General invitation to participate in consultation
Town of Ajax	Lisa Bower	Councillor	Ward 3	August 11, 2020	• General invitation to participate in consultation
Town of Ajax	Joanne Dies	Councillor	Ward 3	August 11, 2020	• General invitation to participate in consultation
Town of Ajax	Rob Tyler-Morin	Councillor	Ward 1	August 13, 2020	• General invitation to participate in consultation
Town of Ajax	Marilyn Crawford	Councillor	Ward 1	August 13, 2020	• General invitation to participate in consultation

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
Town of Ajax	Shaun Collier	Mayor		August 13, 2020	• General invitation to participate in consultation
Town of Whitby	Maleeha Shahid	Councillor	Ward 4	August 11, 2020	• General invitation to participate in consultation
Town of Whitby	Elizabeth Roy	Councillor	Regional	August 11, 2020	• General invitation to participate in consultation
Town of Whitby	Chris Leahy	Councillor	Regional	August 11, 2020	• General invitation to participate in consultation
Town of Whitby	Deidre Newman	Councillor	Ward 2	August 11, 2020	• General invitation to participate in consultation
Town of Whitby	Steve Lee	Councillor	Ward 1	August 13, 2020	• General invitation to participate in consultation
Town of Whitby	Rhonda Mulcahy	Councillor		August 13, 2020	• General invitation to participate in consultation
City of Oshawa	Dan Carter	Mayor		August 11, 2020	• General invitation to participate in consultation
City of Oshawa	Lorne Coe	MPP	Whitby- Oshawa	August 11, 2020	• General invitation to participate in consultation
City of Oshawa	Derek Giberson	Councillor	Ward 4	August 13, 2020	• General invitation to participate in consultation
City of Oshawa	Rick Kerr	Councillor	Ward 4	August 13, 2020	• General invitation to participate in consultation
City of Oshawa	Bradley Marks	Councillor	Ward 3	August 13, 2020	• General invitation to participate in consultation
City of Oshawa	Bob Chapman	Councillor	Ward 3	August 13, 2020	• General invitation to participate in consultation
City of Oshawa	Jane Hurst	Councillor	Ward 2	August 13, 2020	• General invitation to participate in consultation
City of Oshawa	Tito-Dante Marimpietri	Councillor	Ward 2	August 13, 2020	• General invitation to participate in consultation

Municipality	Name	Title	Riding/Ward/Community	Date of Issuance	Relevant TPAP/EA Addenda Project
City of Oshawa	Rosemary McConkey	Councillor	Ward 1	August 13, 2020	• General invitation to participate in consultation
City of Oshawa	John Neal	Councillor	Ward 1	August 13, 2020	• General invitation to participate in consultation
Municipality of Clarington	Margaret Zwart	Councillor	Ward 4	August 13, 2020	• General invitation to participate in consultation
Municipality of Clarington	Corinna Trail	Councillor	Ward 3	August 13, 2020	• General invitation to participate in consultation
Municipality of Clarington	Ron Hooper	Councillor	Ward 2	August 13, 2020	• General invitation to participate in consultation
Municipality of Clarington	Janice Jones	Councillor	Ward 1	August 13, 2020	• General invitation to participate in consultation
Municipality of Clarington	Granville Anderson	Councillor	Ward 3	August 13, 2020	• General invitation to participate in consultation
Municipality of Clarington	Joe Neal	Councillor	Ward 1 and 2	August 13, 2020	• General invitation to participate in consultation
Municipality of Clarington	Adrian Foster	Mayor		August 13, 2020	• General invitation to participate in consultation

A high-level summary of the meetings held with elected officials related to the Electrification EPR Addendum are detailed below.

5.7.1 Doly Begum – MPP (Scarborough Southwest)

A meeting was held with MPP Doly Begum on January 16, 2020 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.7.2 Suze Morrison – MPP (Toronto Centre)

A meeting was held with MPP Suze Morrison on January 20, 2020 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

In addition, a meeting was held with constituents within the Toronto Centre riding on March 2, 2020 to allow for further consultations on the GO Expansion Program beyond the PICs. The benefits of electrification were discussed, and questions were asked related to noise, construction impacts, and the mix of diesel and electric trains on the corridors.

5.7.3 Gary Crawford – Ward 20 Councillor (Scarborough Southwest)

A meeting was held with Councillor Gary Crawford on January 29, 2020 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.7.4 Lisa Kearns – Ward 2 Councillor (Burlington)

A meeting was held with Councillor Lisa Kearns on February 6, 2020 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

In addition, a meeting was held with constituents within Ward 2 on February 20, 2020 to allow for further consultations on the GO Expansion Program beyond the PICs. Discussions were held regarding the broader consultation process, along with the power system utilized for the proposed electrification infrastructure.

5.7.5 Paula Fletcher – Ward 14 Councillor (Toronto-Danforth)

A meeting was held with Councillor Paula Fletcher on February 16, 2020 to discuss GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented.

5.7.6 Sandra Yeung Racco – Ward 4 Councillor (Vaughan)

A meeting was held with Councillor Yeung Racco on May 26, 2020 to discuss aspects of the GO Expansion Program, including the Network-Wide Noise and Vibration Study.

5.7.7 Brad Bradford – Ward 19 Councillor (Beaches-East York)

A meeting was held with Councillor Brad Bradford on June 8, 2020 to discuss the GO Expansion Program. During the meeting, high-level information related to the Electrification Addendum was presented, including information on the changes since the 2017 GO Rail Network Electrification TPAP and new noise studies.

5.7.8 Durham Region MPPs

A meeting was held with MPPs from Durham Region on October 14, 2020 to discuss the GO Expansion Program, including the Thickson Road Bridge widening.

5.7.9 Jane McKenna – MPP (Burlington)

A briefing was held with MPP McKenna on December 4, 2020 to discuss GO Expansion, including details on the Walkers Line Layover.

5.7.10 Steve Yamada – Deputy Mayor and Regional Councillor (Whitby)

A briefing was held with Mayor Yamada on December 7, 2020 to discuss GO Expansion, including details on the Thickson Bridge widening and improvements within Whitby and Oshawa.

5.7.11 Maleeha Shahid – East Ward Councillor (Whitby)

A briefing was held with Mayor Yamada on December 11, 2020 to discuss GO Expansion, including details on the Thickson Bridge widening and improvements within Whitby and Oshawa.

5.7.12 Faisal Hassan – MPP (York South - Weston)

A briefing was held with MPP Hassan on February 8, 2021 to discuss GO Expansion, including the GO Rail Network Electrification Addendum. MPP Hassan expressed support for the electrification of the GO Rail Network and the implementation of noise walls within their riding, and asked for clarification on construction timelines and impacts.

5.8 Draft EPR Addendum Circulation

As part of seeking comments and feedback prior to issuing the Notice of EPR Addendum, a copy of the Draft EPR, including copies of supporting technical studies (included as EPR Addendum Appendices) was circulated to over 80 federal, provincial, municipal review agencies and Indigenous Nations and organizations in August 2020. The complete list of review agencies and Indigenous Nations and organizations who received a copy of the Draft EPR Addendum has been provided in **Table 5-11**. A cover letter was included with the submission, which provided background information on the project, a description of the Draft EPR Addendum content and Appendices, contact information, and described how comments could be submitted to the project team. The cover letters also outlined specific sections of the Draft EPR Addendum that each review agency/Indigenous community may be most interested in (where applicable) in order to assist in navigating the reports and to help focus their review. A sample copy of the cover letter can be found in **Appendix M3**, along with a copy of the email which was sent to each contact.

TABLE 5-11: LIST OF REVIEW AGENCIES & INDIGENOUS NATIONS & ORGANIZATIONS WHO RECEIVED THE DRAFT EPR FOR REVIEW

Review Agency/ Indigenous Community	Draft EPR Addendum Sent	Follow-up Correspondence	Date Comments Received/ Confirmation No Comments Forthcoming	Additional Follow-up/ Confirmation of Comments
Federal				
Department of Fisheries and Oceans Canada	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Environment and Climate Change Canada	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Health Canada	August 4, 2020	August 25, 2020	-	September 1, 2020
National Trust for Canada	August 4, 2020	August 25, 2020, September 11, 2020	-	
Parks Canada	August 4, 2020	August 25, 2020	September 4, 2020	September 4, 2020
Transport Canada	August 4, 2020		August 12, 2020	-
Canadian Transport Agency	August 4, 2020	August 25, 2020	August 25, 2020	-
Greater Toronto Airport Authority	August 4, 2020	August 25, 2020, September 11, 2020	-	-
NavCanada	August 4, 2020	September 11, 2020	-	-
Provincial				
Infrastructure Ontario	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Ministry of Colleges and Universities	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Ministry of Agriculture Food and Rural Affairs	August 4, 2020	August 25, 2020	September 1, 2020	September 3, 2020
Ministry of Children, Community and Social Services	August 4, 2020	August 25, 2020	August 25, 2020	August 26, 2020
Ministry of Community Safety and Correctional Services	August 4, 2020	August 25, 2020, September 11, 2020	-	-

Review Agency/ Indigenous Community	Draft EPR Addendum Sent	Follow-up Correspondence	Date Comments Received/ Confirmation No Comments Forthcoming	Additional Follow-up/ Confirmation of Comments
Ministry of Economic Development, Job Creation and Trade	August 4, 2020		August 17, 2020	August 17, 2020
Ministry of Education	August 4, 2020	August 25, 2020	August 25, 2020	August 26, 2020
Ministry of Energy, Northern Development and Mines	August 4, 2020	August 25, 2020	August 31, 2020	August 31, 2020
Ministry of Indigenous Affairs	August 4, 2020	August 25, 2020, September 11, 2020	September 15, 2020	September 15, 2020
Ministry of Municipal Affairs and Housing	August 4, 2020		August 6, 2020	August 6, 2020
Ministry of Natural Resources and Forestry	August 4, 2020	August 25, 2020	September 3, 2020	September 3, 2020
Ministry of the Environment, Conservation and Parks	August 4, 2020		September 8, 2020	September 8, 2020
Ministry of Heritage, Sport, Tourism and Culture Industries – Sport, Recreation and Community Programs	August 4, 2020	August 25, 2020	August 28, 2020	August 31, 2020
Ministry of Heritage, Sport, Tourism and Culture Industries – Heritage Planning Unit	August 4, 2020	August 25, 2020	September 3, 2020	-
Ministry of Transportation	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Ontario Growth Secretariat	August 4, 2020	August 25, 2020	September 8, 2020	September 10, 2020
Ontario Provincial Police	August 4, 2020		August 24, 2020	August 25, 2020

Review Agency/ Indigenous Community	Draft EPR Addendum Sent	Follow-up Correspondence	Date Comments Received/ Confirmation No Comments Forthcoming	Additional Follow-up/ Confirmation of Comments
Municipal				
City of Barrie	August 4, 2020		September 4, 2020	September 4, 2020
City of Brampton	August 4, 2020	August 25, 2020	September 4, 2020	September 9, 2020
City of Burlington	August 4, 2020	August 25, 2020	September 10, 2020	September 10, 2020
City of Markham	August 4, 2020	August 25, 2020	September 4, 2020	September 4, 2020
City of Mississauga	August 4, 2020		September 3, 2020	September 4, 2020
City of Oshawa	August 4, 2020		September 15, 2020	September 15, 2020
City of Pickering	August 4, 2020		August 6, 2020	August 6, 2020
City of Toronto	August 4, 2020		September 9, 2020	September 10, 2020
City of Vaughan	August 4, 2020	August 25, 2020, September 11, 2020	-	-
County of Simcoe	August 4, 2020	August 25, 2020	August 26, 2020	August 28, 2020
Region of Durham	August 4, 2020		September 4, 2020	-
Region of Halton	August 4, 2020	August 25, 2020	September 3, 2020	September 4, 2020
Region of Peel	August 4, 2020	August 25, 2020	August 25, 2020	September 1, 2020
Region of York	August 4, 2020	August 25, 2020	September 9, 2020	September 10, 2020
Town of Ajax	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Town of Aurora	August 4, 2020	August 25, 2020	September 4, 2020	September 8, 2020
Town of Bradford West Gwillimbury	August 4, 2020	August 25, 2020	August 25, 2020	August 26, 2020
Town of East Gwillimbury	August 4, 2020	August 25, 2020	September 8, 2020	-
Town of Innisfil	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Town of Newmarket	August 4, 2020	August 25, 2020, September 11, 2020	September 11, 2020	September 11, 2020

Review Agency/ Indigenous Community	Draft EPR Addendum Sent	Follow-up Correspondence	Date Comments Received/ Confirmation No Comments Forthcoming	Additional Follow-up/ Confirmation of Comments
Town of Oakville	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Town of Whitby	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Town of Whitchurch-Stouffville	August 4, 2020	August 25, 2020	September 4, 2020	September 4, 2020
Township of King	August 4, 2020	August 25, 2020	September 4, 2020	September 4, 2020
Conservation Authorities				
Central Lake Ontario Conservation Authority	August 4, 2020	August 25, 2020	September 9, 2020	-
Credit Valley Conservation Authority	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Halton Region Conservation Authority	August 4, 2020	August 25, 2020	September 4, 2020	September 8, 2020
Lake Simcoe Region Conservation Authority	August 4, 2020	August 25, 2020, September 11, 2020	September 15, 2020	September 15, 2020
Toronto and Region Conservation Authority	August 4, 2020	September 11, 2020	September 4, 2020	September 14, 2020
Other Stakeholders				
Canadian Pacific Railway	August 4, 2020	August 25, 2020, September 11, 2020	September 17, 2020	September 17, 2020
Canadian National Railway Company	August 4, 2020		August 7, 2020	August 7, 2020
Ontario Heritage Trust	August 4, 2020	August 25, 2020	August 26, 2020	August 28, 2020
Ontario Power Generation	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Via Rail	August 4, 2020	August 25, 2020, September 11, 2020	-	-

Review Agency/ Indigenous Community	Draft EPR Addendum Sent	Follow-up Correspondence	Date Comments Received/ Confirmation No Comments Forthcoming	Additional Follow-up/ Confirmation of Comments
Hydro One	August 4, 2020	August 25, 2020	September 4, 2020	September 8, 2020
407 ETR	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Canada Lands Company	August 4, 2020	August 25, 2020, September 11, 2020	-	-
Indigenous Communities				
Alderville First Nation	August 4, 2020	August 28, 2020	-	-
Beausoleil First Nation	August 4, 2020	August 28, 2020	-	-
Chippewas of Georgina Island	August 4, 2020		-	-
Chippewas of Rama First Nation	August 4, 2020	August 28, 2020	-	-
Curve Lake First Nation	August 4, 2020	August 28, 2020	-	-
Haudenosaunee Confederacy Chiefs Council	August 4, 2020	August 28, 2020	-	-
Hiawatha First Nation	August 4, 2020	August 28, 2020	-	-
Huron-Wendat Nation	August 4, 2020	August 28, 2020	-	-
Kawartha Nishnawbe First Nation	August 4, 2020	August 28, 2020	-	-
Mississaugas of the New Credit First Nation	August 4, 2020	August 28, 2020	-	-
Mississaugas of Scugog Island First Nation	August 4, 2020		August 25, 2020	August 25, 2020
Moose Deer Point First Nation	August 4, 2020	August 28, 2020	-	-
Six Nations of the Grand River	August 4, 2020	August 28, 2020	September 17, 2020	September 17, 2020
Wahta Mohawks	August 4, 2020	August 28, 2020	-	-
Anishinabek Nation Union of Ontario Indians	August 4, 2020	August 28, 2020	-	-
Association of Iroquois and Allied Indians	August 4, 2020	August 28, 2020	-	-

Review Agency/ Indigenous Community	Draft EPR Addendum Sent	Follow-up Correspondence	Date Comments Received/ Confirmation No Comments Forthcoming	Additional Follow-up/ Confirmation of Comments
Métis Nation of Ontario	August 4, 2020	August 28, 2020	-	-
Williams Treaties First Nations (WTFN)	August 4, 2020	August 28, 2020	-	-

The review agencies, Indigenous Nations and organizations were asked to provide comments no later than September 4, 2020, with extensions granted for review agencies and Indigenous Nations and organizations to provide comments by September 11, 2020 and September 18, 2020 respectively. While most comments were received by these dates, it is noted that several were received after the due date; however, these comments were still considered and responded to by Metrolinx. Approximately 23 review agencies provided comments on the Draft EPR Addendum. Each comment/question was responded to via detailed comment/response tables that were prepared and submitted back to each review agency. Table 5-12 to Table 5-33 below contain each comment (verbatim) submitted by each specific review agency as well as how the comment was considered and responded to by Metrolinx.

It is noted that while a response with comments was received from Six Nations of the Grand River, not all comments were specific to the EPR Addendum. Further details on this letter are included in Section 5.4.2.

As a follow-up to Metrolinx responses, some stakeholders provided additional comments or clarifications. These stakeholders include MHSTCI, TRCA, and CoT. These additional comments and clarifications, including Metolinx's responses, are included in their respective tables below. Additional technical comments on the Noise and Vibration and Air Quality reporting were also provided by MECP and the City of Toronto between November 2020 and January 2021. These comments were incorporated into the final reporting for these documents, which is captioned within Sections 2, 3, 4, and 6 of the EPR Addendum.

The following review agencies and Indigenous Nations and organizations confirmed receipt of the Draft EPR Addendum and advised that they had no comments at the time:

Federal

- Transport Canada
- Health Canada
- Canadian Transportation Agency

Provincial

- Ministry of Agriculture, Food, and Rural Affairs
- Ministry of Economic Development, Job Creation and Trade
- Ministry of Education
- Ministry of Energy, Northern Development and Mines

- Ministry of Children, Community and Social Services
- Ministry of Municipal Affair and Housing
- Ministry of Indigenous Affairs
- Ontario Provincial Police

Municipal

- City of Pickering
- County of Simcoe
- Town of Bradford West Gwillimbury

Other

- Ontario Heritage Trust
- Canadian National (CN) Railway Company
- Canadian Pacific (CP) Railway Company

Indigenous Nations & Organizations

- Mississaugas of Scugog Island First Nation

5.8.1.1 Federal Review Agency Comments Received on Draft EPR Addendum

Table 5-12 and **Table 5-13** below contains comments (verbatim) submitted by each federal review agency as well as how the comment was considered and responded to by Metrolinx.

TABLE 5-12: PARKS CANADA DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Commitments/Future Work	Parks Canada appreciates and acknowledges Metrolinx's engagement efforts to help address our previous comments identified within the previous Environmental Project Report (EPR) correspondence, most recently acknowledged in communications received on Nov. 17, 2017, our comments remain consistent. Please see the attached letter for the above-mentioned correspondence.	Acknowledged. Commitments made as part of the 2017 GO Rail Network Electrification EPR will continue to be upheld.
2	General	We would like to acknowledge the several references to Rouge National Urban Park. Further, we would like to express our appreciation for considering the park when projects are not necessarily within the limits of the park, but in close proximity to our official boundary.	Acknowledged.
3	Referencing	Since our last correspondence in 2017, the Rouge National Urban Park Management Plan has come into full force and effect, and the 2014 Draft Management Plan is no longer the most up-to-date version. Please consider this letter as a confirmation that the 2014 Draft Management Plan will no longer be referenced and rather replaced with its official counterpart, the Rouge National Urban Park Management Plan (2019).	Acknowledged, applicable references within the EPR Addendum and associated technical reports will be updated.
4	General	Thank you for continuing to include Parks Canada in the engagement process of your upcoming and future projects by requesting our commentary. As custodians of Rouge National Urban Park, we take great pride in our role as the protectors of natural and cultural heritage. With this being said, we value the relationship we have with Metrolinx as a great conveyor of regional access, which helps to bring both new and existing visitors to our park.	Thank you for the support. We look forward to working with Parks Canada through the subsequent phases of the project As part of GO Expansion, Metrolinx is pleased to provide funding opportunities for initiatives such as the recent planting of approximately 4,800 trees and 7,500 shrubs at Rouge National Urban Park by Parks Canada and the TRCA. https://blog.metrolinx.com/2020/10/30/metrolinx-partners-with-toronto-conservation-authority-and-parks-canada-to-plant-more-than-12000-trees-and-shrubs-at-rouge-national-urban-park/

TABLE 5-13: TRANSPORT CANADA DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Requirement for Transport Canada Review	Please note Transport Canada does not require receipt of all individual or Class EA related notifications. We are requesting project proponents self-assess if their project: 1. Will interact with a federal property and/or waterway by reviewing the Directory of Federal Real Property, available at at www.tbs-sct.gc.ca/dfrp-rbif/; and 2. Will require approval and/or authorization under any Acts administered by Transport Canada* available at http://www.tc.gc.ca/eng/acts-regulations/menu.htm.	• With respect to potential interactions with federal property, please refer to Response #2 below. • With respect to identification of any approvals and/or authorizations under any Acts administered by Transport Canada that may be applicable to the GO Rail Network Electrification TPAP Addendum undertaking: ○ Transport Canada is responsible for administering the *Navigation Protection Act* (formerly the Navigable Waters Protection Act). The *Navigation Protection Act* applies to works which are constructed or placed in, on, over, under, though, or across scheduled navigable waterways. ▪ With respect to proposed infrastructure under the current GO Rail Network Electrification TPAP Addendum scope, no infrastructure is proposed to be constructed or placed in, over, under, though, or across scheduled navigable waterways. At this time none of the activities required as part of project are anticipated to require authorization under this Act. Notwithstanding this, Navigation Protection Act provisions will be reviewed during detailed design, and the Contractor shall abide by the requirements of applicable legislation including the *Navigation Protection Act*. ○ Transport Canada is responsible for administering the *Railway Safety Act*. The majority of the work will be taking place on Metrolinx owned rail corridors and Metrolinx owned right of way. Consequently, Transport Canada does not have direct jurisdiction over these works. ○ Transport Canada is responsible for administering the *Transportation of Dangerous Goods Act* (TDGA). The TDGA regulates the transportation of dangerous goods by air, marine, rail and road. At this time none of the activities required as part of the GO Rail Network Electrification TPAP Addendum are anticipated to require authorization under this Act. Notwithstanding this, TDGA provisions will be reviewed during detailed design, and the Contractor shall abide by the requirements of applicable legislation including the TDGA. ○ Transport Canada is responsible for administering the *Aeronautics Act* which regulates aerodromes, related buildings and services used for aviation. In addition, it regulates and has an interest in structures and activities which may have the potential to cause interference in aviation activities. As part of ensuring that the project design, construction and operation do not adversely affect airport operations, NavCan and GTAA were provided with a copy of the Draft GO Rail Network Electrification EPR Addendum for review. The project team will address any of their comments. Consultation with NavCan and GTAA will continue throughout the TPAP Addendum and Detailed Design phase to ensure that any required agreements, approvals or authorizations are obtained prior to project implementation.
2	Proximity to Federal Properties	Projects that will occur on federal property prior to exercising a power, performing a function or duty in relation to that project, will be subject to a determination of the likelihood of significant adverse environmental effects, per Section 82 of the Impact Assessment Act, 2019.	• The Directory of Federal Real Property has been reviewed and property impacts were reviewed. Section 2.3 of EPR Addendum provides a summary of potential property impacts identified based on the conceptual design (i.e., potential property acquisitions/easements/etc.). Please note that property requirements will be further reviewed and refined during detailed design. • With respect to waterways, see response to Comment #1. • With respect to proposed infrastructure under the current GO Rail Network Electrification TPAP Addendum scope, no infrastructure is proposed on federally owned lands. Therefore, there are no anticipated property impacts.
3	Ongoing Engagement	If the aforementioned does not apply, the Environmental Assessment program should not be included in any further correspondence and future notifications will not receive a response.	Noted, the project contact list will be updated accordingly.
4	Ongoing Engagement	If there is a role under the program, correspondence should be forwarded electronically to: EnviroOnt@tc.gc.ca with a brief description of Transport Canada's expected role.	Acknowledged
5	Applicability of Acts administered by Transport Canada	Below is a summary of the most common Acts that have applied to projects in an Environmental Assessment context: • Canadian Navigable Waters Act (CNWA) – the Act applies primarily to works constructed or placed in, on, over, under, through, or across navigable waters set out under the Act. The Navigation Protection Program administers the CNWA through the review and authorization of works affecting navigable waters. Information about the Program, CNWA and approval process is available at: http://www.tc.gc.ca/eng/programs-621.html.Enquiries can be directed to NPPONT-PPNONT@tc.gc.ca or by calling (519) 383-1863. • Railway Safety Act (RSA) – the Act provides the regulatory framework for railway safety, security, and some of the environmental impacts of railway operations in Canada. The Rail Safety Program develops and enforces regulations, rules, standards and procedures governing safe railway operations. Additional information about the Program is available at: https://www.tc.gc.ca/eng/railsafety/menu.htm. Enquiries can be directed to RailSafety@tc.gc.ca or by calling (613) 998-2985. • Transportation of Dangerous Goods Act (TDGA) – the transportation of dangerous goods by air, marine, rail and road is regulated under the TDGA.	Acknowledged. Please refer to Response #1 above.

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
		Transport Canada, based on risks, develops safety standards and regulations, provides oversight and gives expert advice on dangerous goods to promote public safety. Additional information about the transportation of dangerous goods is available at: https://www.tc.gc.ca/eng/tdg/safety-menu.htm. Enquiries can be directed to TDG-TMDOntario@tc.gc.ca or by calling (416) 973-1868. • Aeronautics Act – Transport Canada has sole jurisdiction over aeronautics, which includes aerodromes and all related buildings or services used for aviation purposes. Aviation safety in Canada is regulated under this Act and the Canadian Aviation Regulations (CARs). Elevated Structures, such as wind turbines and communication towers, would be examples of projects that must be assessed for lighting and marking requirements in accordance with the CARs. Transport Canada also has an interest in projects that have the potential to cause interference between wildlife and aviation activities. One example would be waste facilities, which may attract birds into commercial and recreational flight paths. The Land Use In The Vicinity of Aerodromes publication recommends guidelines for and uses in the vicinity of aerodromes, available at: https://www.tc.gc.ca/eng/civilaviation/publications/tp1247-menu-1418.htm. Enquires can be directed to at tc.aviationservicesont-servicesaviationont.tc@tc.gc.ca or by calling 1 (800) 305-2059 / (416) 952-0230.	

5.8.1.2 Provincial Review Agency Comments Received on Draft EPR Addendum

Table 5-14 to **Table 5-17** below contain comments (verbatim) submitted by each provincial review agency as well as how the comment was considered and responded to by Metrolinx.

TABLE 5-14: MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	General	The draft EPR Addendum submitted was incomplete and therefore, the ministry was unable to complete its review prior to the date Metrolinx has proposed for its final notice of the EPR Addendum. The Transit Guide states that 'circulation of draft reports to regulatory agencies allows the proponent the opportunity to include comments from regulatory agencies in the final report, so that other interested persons should have an opportunity to see whether regulatory agencies have any concerns about the project.'	To provide clarification: the "final" version of the EPR Addendum is not scheduled until the Notice of EPR Addendum is posted and the document is available for 30-day review. The purpose of circulating the draft EPR Addendum to MECP and other GRT agencies at the beginning of August was to solicit comments and feedback on the draft report. Metrolinx will review and respond to all comments received on the Draft EPR Addendum and revisions will be incorporated into an updated EPR Addendum document as appropriate. In other words, Metrolinx is following the suggested practice as outlined in the Transit Project Guide – i.e., that "*circulation of draft reports to regulatory agencies allows the proponent the opportunity to include comments from regulatory agencies in the final report, so that other interested persons should have an opportunity to see whether regulatory agencies have any concerns about the project*". Since the circulation of the Draft EPR Addendum in August 2020, the following changes to the proposed scope of work have occurred: • Electrification of the Beach Layover has been removed from the proposed scope of work. As such, discussion of Beach Layover will be removed from the Final EPR Addendum. • Electrification of the Midland Layover proposed as part of the Scarborough Junction Grade Separation (SJGS) TPAP has been added to the proposed scope of work. The assessment of electrification impacts at the Midland Layover will rely on technical studies, including natural environment and stormwater management reports completed as part of the SJGS TPAP. Should MECP have any further questions or require clarification on the responses provided, please feel free to let us know. The Project Team would also be happy to schedule a follow-up meeting to discuss the project in more detail, if needed.
2	General – Report Organization	**Draft EPR Addendum, Section 2** Section 2- Update to Detailed Project Description. For clarity this section should be organized with information regarding the Go Rail network Electrification Addendum at the beginning of the section followed by an explanation of how the 2017 Go Rail Network Electrification TPAP and NT&F aligns with the addendum.	Acknowledged. The organization of Section 2 will be reviewed and updated as required to ensure clarity regarding the GO Rail Network Electrification Addendum scope and relation to the 2017 GO Rail Network Electrification TPAP and New Track and & Facilities (NT&F) TPAP.
3	General – Baseline Conditions	**Draft EPR Addendum, Section 3** Section 3 should report existing baseline conditions for the draft EPR addendum. Reports like the Air Quality Assessment (Appendix F) are currently in progress and are not found in this draft EPR addendum.	Acknowledged. The Final EPR Addendum will include additional information for studies, such as Air Quality that were in progress at the time of the Draft EPR Addendum circulation to MECP and other GRT agencies in August 2020. It is noted that Metrolinx subsequently provided copies of the following draft Air Quality Assessment reports in support of the GO Rail Network Electrification Addendum to MECP in October 2020 for review: • USRC Local Air Quality Assessment • Kitchener Local Air Quality Assessment • Lakeshore East Local Air Quality Assessment • Network-Wide Regional Air Quality Study MECP comments provided on the above noted reports will be considered and addressed as part of finalizing the technical reports and incorporated within the final EPR Addendum document, as appropriate. Please note that separate studies have been prepared under the New Track & Facilities TPAP, to assess local air quality and noise & vibration impacts associated with that undertaking.
4	General – Impact Assessment	**Draft EPR Addendum, Section 4** Incomplete studies to review. (See Section 4.2 Union Station Rail Corridor for example- Air Quality) Mitigation measures need to be highlighted within the draft EPR addendum. Several times in the draft EPR addendum it is highlighted that a summary of mitigation measures and monitoring commitments has been developed in their respective reports for the [X] Corridor and will be included in a study that is currently in progress and that the EPR text will be updated once available.	Acknowledged. The final EPR Addendum will include additional information for studies, such as Air Quality that were in progress at the time of the Draft EPR Addendum circulation to MECP and other GRT agencies in August 2020. In addition, the final EPR Addendum will include further mitigation and monitoring recommendations for studies that were not previously available at the time of the Draft EPR Addendum circulation. It is noted that proposed measures for mitigating potential negative impacts the transit project might have on the environment are presented in Section 4 and 6. Detailed summary tables containing all mitigation measures pertinent to each environmental component are provided in Section 4, Table 4-41 to Table 4-53. Refinements to these tables will be made as part of the final EPR Addendum to ensure all appropriate mitigation measures are reflected.

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		Section 3.2.4 "Documentation requirements" of the Transit guide states that the EPR must contain "A description of any proposed measures for mitigating any negative impacts the transit project might have on the environment."	
5	General – Impact Assessment	**Draft EPR Addendum, Section 4** Incomplete studies to review. Please ensure that the draft EPR addendum contains a means to measure or verify any mitigation measures if they are proposed. Mitigation measures related to missing reports such as Air Quality and Noise and Vibration are missing from the draft EPR addendum. "Documentation requirements" of the Transit guide states that "If mitigation measures are proposed under paragraph 7, a description of the means the proponent proposes to use to monitor or verify their effectiveness".	Acknowledged. The final EPR Addendum will include additional information for studies, such as Air Quality and Noise & Vibration that were in progress at the time of the Draft EPR Addendum circulation to MECP and other GRT agencies in August 2020. In addition, the final EPR Addendum will include further mitigation and monitoring recommendations for studies that were not previously available at the time of the Draft EPR Addendum circulation. It is noted that proposed measures for mitigating potential negative impacts the transit project might have on the environment and associated monitoring requirements are presented in Section 4 and 6. Detailed summary tables containing all mitigation and monitoring measures pertinent to each environmental component are provided in Section 4, Table 4-41 to Table 4-53. Refinements to these tables will be made as part of the final EPR Addendum to ensure all appropriate mitigation measures and associated monitoring requirements are reflected.
6	General – Impact Assessment	**Draft EPR Addendum, Section 4** Incomplete studies to review. Please ensure that the draft EPR addendum contains a summary of commitments made regarding monitoring during construction and operation. Section 4.9- Construction Impacts does not list Air Quality and Noise and Vibration related to construction since these reports are missing from the EPR.	Acknowledged. The final EPR Addendum will include additional information for studies, such as Air Quality and Noise & Vibration that were in progress at the time of the Draft EPR Addendum circulation to MECP and other GRT agencies in August 2020. In addition, the final EPR Addendum will include further mitigation and monitoring recommendations for studies that were not previously available at the time of the Draft EPR Addendum circulation. This will include further updates to Section 4.8 and 4.9 to ensure all appropriate mitigation measures and monitoring commitments for operation and construction phases of the project are identified. It is noted that proposed measures for mitigating potential negative impacts the transit project might have on the environment and associated monitoring requirements are presented in Section 4 and 6. Detailed summary tables containing all mitigation and monitoring measures pertinent to each environmental component are provided in Section 4, Table 4-41 to Table 4-53. Refinements to these tables will be made as part of the final EPR Addendum to ensure all appropriate mitigation measures and associated monitoring requirements are reflected.
7	General – Impact Assessment	**Draft EPR Addendum, Section 4** Incomplete studies to review. Please add a description of the any negative impacts to the environment that cannot be successfully mitigated. Mitigation measures related to missing reports such as Air Quality are missing from the EPR.	Acknowledged. The final EPR Addendum will include additional information for studies, such as Air Quality that were in progress at the time of the Draft EPR Addendum circulation to MECP and other GRT agencies in August 2020. In addition, the final EPR Addendum will include further mitigation and monitoring recommendations for studies that were not previously available at the time of the Draft EPR Addendum circulation. Clarification regarding any anticipated negative impacts to the environment that cannot be successfully mitigated will be added to Section 4 and 6, as required.
8	Indigenous Consultation	**Draft EPR Addendum, Section 5** Incomplete. Section 5.4.2- Follow Up Efforts and Communications and Section 5.4.4- 8 Meetings with Indigenous Communities state, "This section of the draft EPR Addendum will be expanded as the project progresses" Page 376: "On February 10, 2020, Curve Lake First Nation acknowledged the receipt of the project notification. Curve Lake First Nation notified Metrolinx that they will not be able to attend the scheduled round one public consultation meetings and requested Metrolinx to coordinate a meeting with Curve Lake First Nation to discuss the project as well as other projects included under the GO Expansion TPAP." How did Metrolinx respond to the request to the meeting? Was it offered? What was the outcome? If not offered, why?	Metrolinx wishes to note that the final EPR Addendum Section 5 will contain a comprehensive description of how the public, review agencies, municipalities, stakeholders and Indigenous communities were consulted as part of the TPAP Addendum. Further, Section 5 has been augmented and revised since the preparation of the draft EPR Addendum to further capture how stakeholder and indigenous community feedback/comments were considered and addressed. a. A meeting took place on April 14, 2020, where Metrolinx presented Curve Lake First Nation an overview of the GO Expansion Program, as well as the environmental assessments and network-wide studies currently underway. Additional meeting details have been added in Section 5.4.3. A cross-reference to this section will be added for clarity. An updated extract of EPR Addendum Section 5 including consultation activities and correspondence up-to and including PIC #2 has been provided as an attachment to this response. Please note ERP Addendum Section 5 is continually being updated as the project progresses, and the file provided is not considered final/complete.

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9	General – Consultation	**Draft EPR Addendum, Section 5 and Appendix M** Incomplete documentation. Appendix M: Consultation Record, and Section 5.4.2- Follow Up Efforts and Communications	Acknowledged. A complete Appendix M: Consultation Record will be provided as part of the final EPR Addendum submission. Consultation activities continue to remain ongoing as part of the TPAP Addendum process. A preliminary draft of Appendix M including materials and correspondence up-to and including PIC #2 has been provided as an attachment to this response. Please note the Consultation Record is continually being updated as the project progresses, and the file provided is not considered final/complete. Metrolinx wishes to note that the final EPR Addendum Section 5, including Section 5.4.2 will contain a comprehensive description of how the public, review agencies, municipalities, stakeholders and Indigenous communities were consulted as part of the TPAP Addendum. Further, Section 5 has been augmented and revised since the preparation of the draft EPR Addendum to further capture how stakeholder and Indigenous community feedback/comments were considered and addressed, including associated follow up efforts and communications.
11	Source Water Protection	Please note that where it has been determined that the project intersects with a vulnerable area, consideration of source protection must be clearly documented within the project file or environmental project report, as applicable. Specifically the report should identify the source protection area where the rail network segment or rail facility is located, discuss whether or not that portion of the project is located in a vulnerable area, and provide applicable details about the area (e.g. Union Station is located within the Toronto Source Protection Area, intersects with an intake protection zone, and is subject to the policies of the source protection plan for the Credit Valley, Toronto and Region, and Central Lake Ontario (CTC) Source Protection Region). If located in a vulnerable area, proponents should document whether any project activities are prescribed drinking water threats and thus pose a risk to sources of drinking water (this should be consulted on with the appropriate source protection authority). Where an activity poses a risk to drinking water, the proponent must document and discuss in the project file or environmental study report how the project complies with, or has regard to, applicable policies in the local source protection plan. This section should then be used to inform, and be reflected in, other sections of the report, such as the identification of net positive/ negative effects of alternatives, mitigation measures, evaluation of alternatives etc. We acknowledge that this information has been included in some portions of the draft EPR, however this hasn't been done with consistency for each segment or facility of the rail network. The proponent should consult with the local source protection authority(ies) if they have not already done so. The local source protection authority can provide proponents with assistance in determining whether an activity associated with the construction or operation of the project may be a drinking water threat as per the CWA and will be able to help determine whether there are policies in the source protection plan that may apply. Please note, even if the project activities in a vulnerable area are deemed not to pose a risk to drinking water, there may be other policies that apply, and so consultation with the local source protection authority is important. Future revisions of the EPR Addendum should indicate the name of the source protection area, applicable source protection plan and policies, vulnerable areas, and any mitigation measures for each segment or facility of the rail network included in the EPR Addendum.	It is noted that the methodology to assess potential drinking water source protection impacts is consistent with the 2017 GO Rail Network Electrification TPAP and that previous commitments made as part of the 2017 GO Rail Network Electrification TPAP will continue to be upheld and carried forward as part of the GO Rail Network Electrification Addendum. Source Protection Plans (SPPs), groundwater wellhead protection areas (WHPA) and surface water intake protection zones (IPZ) within the GO Rail Network Electrification Addendum Study Area were identified as part of the Hydrological Assessment Study (EPR Addendum, Appendix L) and summarized within applicable Groundwater & Wells subsections within Draft EPR Addendum, Section 3 (Baseline Conditions). This section will be reviewed and updated, as required, to provide further clarity. The subsurface footprint of the OCS foundations is relatively small and shallow and therefore not expected to cause any adverse groundwater or source water protection impacts. EPR Addendum, Section 4 (Impact Assessment) will be reviewed to ensure discussions of potential impacts are clear and cross-references to the Table 4-53: Summary of Groundwater Mitigation and Monitoring Commitments are provided. It is also noted that EPR Addendum, Section 6.3.2.1.6 (MECP – Clean Water Act) provides the following summary and commitment for future work: *"Ontario's Clean Water Act provides a basic framework for protecting drinking water supplies in the province. This involves identifying and assessing risks to the quality and quantity of drinking water sources to determine which risks are significant; developing a source protection plan to establish how the risks will be addressed; and implementing the plan through land use planning and regulatory mechanisms or voluntary initiatives. The hydrogeological impact assessment referenced as part of this EPR Addendum involved identification and assessment of relevant groundwater and groundwater dependent natural heritage features, including the presence of water supply wells, wellhead protection areas and significant groundwater recharge areas. As part of the hydrogeological impact assessment, potential effects related to the Project were assessed and mitigation measures were identified along with the need for further assessment during the detailed design stage of the project (see Section 4 of this Significant Addendum to the 2017 GO Rail Network Electrification EPR).* *With respect to wellhead protection areas and Source Water Protection regulations, these policies will be reviewed in detail as part of the final design phase to confirm their applicability to the electrification project works. At the time of writing this report, in terms of project construction activities, it is acknowledged that there is potential for spills of fuels or other hazardous materials to occur during fueling of construction equipment or other construction activities, which may affect groundwater quality. Therefore, mitigation and commitments to address these effects are outlined in Section 4.9 and Section 6.7.9."*
1	General	The draft EPR Addendum submitted was incomplete and therefore, the ministry was unable to complete its review prior to the date Metrolinx has proposed for its final notice of the EPR Addendum. The Transit Guide states that 'circulation of draft reports to regulatory agencies allows the proponent the opportunity to include comments from regulatory agencies in the final report, so that other	To provide clarification: the "final" version of the EPR Addendum is not scheduled until the Notice of EPR Addendum is posted and the document is available for 30-day review. The purpose of circulating the draft EPR Addendum to MECP and other GRT agencies at the beginning of August was to solicit comments and feedback on the draft report. Metrolinx will review and respond to all comments received on the Draft EPR Addendum and revisions will be incorporated into an updated EPR Addendum document as appropriate. In other words, Metrolinx is following the suggested practice as outlined in the Transit Project Guide – i.e., that "*circulation of draft reports to regulatory agencies allows the proponent the opportunity to include comments from*

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		interested persons should have an opportunity to see whether regulatory agencies have any concerns about the project.'	*regulatory agencies in the final report, so that other interested persons should have an opportunity to see whether regulatory agencies have any concerns about the project*". Since the circulation of the Draft EPR Addendum in August 2020, the following changes to the proposed scope of work have occurred: • Electrification of the Beach Layover has been removed from the proposed scope of work. As such, discussion of Beach Layover will be removed from the Final EPR Addendum. • Electrification of the Midland Layover proposed as part of the Scarborough Junction Grade Separation (SJGS) TPAP has been added to the proposed scope of work. The assessment of electrification impacts at the Midland Layover will rely on technical studies, including natural environment and stormwater management reports completed as part of the SJGS TPAP. Should MECP have any further questions or require clarification on the responses provided, please feel free to let us know. The Project Team would also be happy to schedule a follow-up meeting to discuss the project in more detail, if needed.

TABLE 5-15: MINISTRY OF HERITAGE, SPORT, TOURISM AND CULTURE INDUSTRIES DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx	Comment/Issue Raised by Review Agency (December 22, 2020)	How Comment was Considered by Metrolinx (January 21, 2021)
1	General – Report Organization	See attached letter. The draft EPR should be reorganized and revised to be consistent with our comments on the New Track & Facilities TPAP EPR, and with the cultural heritage technical documents for this project as they are revised and reviewed.	We can advise that the New Track & Facilities Project Team received the comments and a response was issued in late September 2020. The comments will also be considered when finalizing the Electrification EPR Addendum. It is noted that the current EPR Addendum organization works well for this project and its specific details.	-	-
2	General – Report Organization	**Draft EPR Addendum, Section 1.6** Appendix C here is listed as "Cultural Heritage Assessment". The document in Appendix C is a "Cultural Heritage Technical Memorandum". As per the attached letter we would like to discuss a more appropriate format for the supporting documentation on built heritage resources and cultural heritage landscapes. In any case the reference here should match the title of the document.	Acknowledged. The name of Appendix C with match the document title as part of the Final EPR Addendum submission.	-	-
3	Cultural Heritage/Archaeology	**Draft EPR Addendum, Section 3.1.2** Cultural heritage includes archaeology, built heritage resources, and cultural heritage landscapes. Where the latter two are being addressed separately from archaeology, they should be referred to as such. "Features" is not a well-defined or standard term in reference to cultural heritage resources. Therefore, the bullet "Cultural Heritage Features (i.e., built heritage features, cultural landscapes)" should be replaced with simply "Built Heritage Resources and Cultural Heritage Landscapes", or appropriate acronyms.	Acknowledged. The text has been revised accordingly.	-	-
4	Archaeology	**Draft EPR Addendum, Section 3.1.2** The bullet "Archaeological Features" should be replaced with "Archaeological Resources".	Acknowledged. The text has been revised accordingly.	-	-
5	Cultural Heritage	**Draft EPR Addendum, Section 3.3.3, 3.4.3, 3.5.3, 3.6.3, 3.7.3, 4.3.3, 4.4.3, 4.5.3, 4.6.3, 4.7.3, 4.8.3, 4.9.3** See item #3 above. Section titles should be changed to "Built Heritage Resources and Cultural Heritage Landscapes". Where built heritage resources and cultural heritage landscapes are referred to by number from the original EPR, their name and/or address should also be included on first reference, as it is in Table 4-44.	Acknowledged. Section headings have been updated and BHR and CHL names/addresses will be added for first reference.	-	-
6	Cultural Heritage	**Draft EPR Addendum, Section 3.3.3.2** The reference to "previously identified" BHRs or CHLs is confusing. It is not clear whether "previously identified" refers only to resources that had been recognized prior to the GO Electrification project and its associated TPAP projects, or to resources that	Acknowledged. Text will be revised to remove references to "previously identified"	-	-

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		were identified through fieldwork as part of these TPAPs prior to the current addendum. Please edit language for clarity.			
7	Archaeology	**Draft EPR Addendum, Section 3.3.4.2** This section summarizes the indicators of archaeological potential present in the study area but does not clearly indicate whether, based on soil disturbance, archaeological potential exists. It is not clear whether this listing of criteria is based on the results of a Stage 1 Archaeological Assessment, or whether it is based on the results of screening carried out to determine whether a Stage 1 Archaeological Assessment is necessary. Before the Addendum is finalized, any required Stage 1 Archaeological Assessment work should be completed, and this text should be revised to clearly reflect its conclusions. The reference to the Borden block in which the study area is located is unnecessary, and not likely to be understood by non-specialist readers. We therefore suggest the removal of the sentence "Segments within this study area are located within AjGv." This section also includes the statement "According to background research, one previous ASI report details fieldwork within 50 metres of the LSW-2 study area", followed by a full citation of a 2017 Stage 1 report by ASI. The purpose of the sentence or the reference and how they are linked is unclear. A Stage 1 report does not generally involve fieldwork. If this Stage 1 report is in fact the background research which notes a previous report that details fieldwork, it is not clear why full bibliographic information is provided in the body of the document. In any case, it is not clear why the section notes that fieldwork has been carried out within 50 metres of the study area, especially without noting the results of that fieldwork. The fact that fieldwork was carried out is not itself an indicator of archaeological potential, which the sentence following this seems to imply. We recommend removing this text, or revising it to clarify its purpose.	Acknowledged. The purpose of this section is to provide a summary of the screening carried out to determine the need for a Stage 1 Archaeological Assessment (AA), and is generally consistent with the methodology/structure presented in the original 2017 GO Rail Network Electrification EPR. It is noted that a Stage 1 AA has been completed to support the EPR Addendum as part of the New Track & Facilities TPAP. Determination of archeological potential is presented in Section 4.3.4.2. Acknowledgement of the completion of a Stage 1 AA will be provided within baseline conditions discussions presented in EPR Addendum, Section 3. The following statement, as requested has been deleted: "Segments within this study area are located within *AjGv*." For clarity, reference to the previous Stage 1 AA will be revised as follows: *"This section was subject to at least one previous archaeological assessment (ASI 2017a), completed as part of the 2017 GO Rail Network Electrification TPAP."*	Where a previous archaeological assessment report is referenced in the context of baseline conditions, the reference should note the stage of assessment and whether or not it recommended further assessment. Saying simply that the area was subject to a previous archaeological assessment could be interpreted to mean that archaeological assessment requirements have been satisfied. We would therefore recommend that the sentence proposed by Metrolinx be revised as follows: *"This section was subject to at least one previous **stage 1** archaeological assessment (ASI 2017a), completed as part of the 2017 GO Rail Network Electrification TPAP, **which recommended stage 2 assessment**."*	It is agreed that the reference should note the stage of assessment, however the report recommendation did not include a Stage 2 assessment for that portion of the LSW corridor or the immediately adjacent Mimico Switching Station and Mimico (Canpa) 25kV Feeder Route. As such, Metrolinx proposes to revise the statement as follows: "*This section was subject to at least one previous **stage 1** archaeological assessment (ASI 2017a), completed as part of the 2017 GO Rail Network Electrification TPAP, **which determined that no further archaeological assessment was required for the 2017 OCS Impact/Vegetation Clearance Zone footprint**."*
8	Archaeology	**Draft EPR Addendum, Section 3.3.4.9** See item #7 above re 3.3.4.2. The text should clearly state the status of the Stage 1 Archaeological Assessment and reflect its determination of archaeological potential, and the sentence identifying the Borden block is unnecessary. Further, it is unclear why this section reports on the presence of archaeological sites only as being within 1 km and not within 50 m of the study area, when 300 m is generally the distance threshold used for registered archaeological sites when screening for archaeological potential.	Beach Layover has been removed from the proposed scope of work of the New Track & Facilities TPAP and GO Rail Network Electrification Addendum. References to Beach Layover will be removed from both the New Track & Facilities EPR and the GO Rail Network Electrification Addendum and Impact Assessments, where possible. It is noted that references to Beach Layover will continue to remain in Baseline Conditions reporting prepared as part of the New Track & Facilities EPR.	**Items #8 and 9** (re Sections 3.3.4.9 and 3.4.4.1), and items for which the MHSCTI comment or Metrolinx response refers back to these: We acknowledge that the references to archaeological sites within 1 km of the study corridor has been carried over from the 2017 TPAP. However, the rationale for the 50 metre buffer remains unclear. It would make more sense to either note whether any of the known sites are within 300 metres, as this is an indicator of archaeological potential, or whether any of them are within the proposed footprint, as this would be a reason to proceed directly to Stage 3 or 4 archaeological assessment (depending on the stage of assessment previously carried out for the site).	A 50 metre buffer was used in light of the conceptual nature and vast geographic reach of the project and is consistent with the 2017 TPAP approach, which was carried forward to this assessment. Confirmation of archaeological potential and recommendations for further assessment will be noted within the associated corridor subsections within EPR Addendum, Section 4 (Impact Assessment) and Appendix D (Stage 1 Archaeological Assessment Report – prepared as part of the New Track & Facilities TPAP).

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			Clarification text will be added to the GO Rail Network Electrification EPR Addendum, Section 2.1.2 to explain that Beach Layover was removed from the EA approval scope during the course of the project. As such, Section 3.3.4.9 will be removed from the Final EPR Addendum document. A 1 km buffer for the identification of previously registered archaeological sites is consistent with the 2017 GO Rail Network Electrification TPAP methodology and has been carried forward for consistency. It is noted that confirmation that none of the previously registered archaeological sites are located within 50 m has been provided.		
9	Archaeology	**Draft EPR Addendum, Section 3.4.4.1** See item #8 above re 3.3.4.9.	A 1 km buffer for the identification of previously registered archaeological sites is consistent with the 2017 GO Rail Network Electrification TPAP methodology and has been carried forward for consistency. It is noted that confirmation that none of the previously registered archaeological sites are located within 50 m has been provided.	**Items #8 and 9** (re Sections 3.3.4.9 and 3.4.4.1), and items for which the MHSCTI comment or Metrolinx response refers back to these: We acknowledge that the references to archaeological sites within 1 km of the study corridor has been carried over from the 2017 TPAP. However, the rationale for the 50 metre buffer remains unclear. It would make more sense to either note whether any of the known sites are within 300 metres, as this is an indicator of archaeological potential, or whether any of them are within the proposed footprint, as this would be a reason to proceed directly to Stage 3 or 4 archaeological assessment (depending on the stage of assessment previously carried out for the site).	A 50 metre buffer was used in light of the conceptual nature and vast geographic reach of the project and is consistent with the 2017 TPAP approach, which was carried forward to this assessment. Confirmation of archaeological potential and recommendations for further assessment will be noted within the associated corridor subsections within EPR Addendum, Section 4 (Impact Assessment) and Appendix D (Stage 1 Archaeological Assessment Report – prepared as part of the New Track & Facilities TPAP).
10	Archaeology	**Draft EPR Addendum, Section 3.4.4.2** See item #8 above re 3.3.4.9.	See response to Item #9.	-	-
11	Cultural Heritage	**Draft EPR Addendum, Section 3.5.3.3** This section should briefly summarize the results of the report it references. The purpose of the section is to note the baseline conditions of the study area with respect to built heritage resources and cultural heritage landscapes for purposes of the current addendum.	Acknowledged. Additional text summarizing the results of previous reporting, including any identified built heritage resources and cultural heritage landscapes will be provided.	-	-
12	Cultural Heritage	**Draft EPR Addendum, Section 3.5.3.6** See item #11 above re 3.5.3.3.	See response to Item #11.	-	-
13	Cultural Heritage	**Draft EPR Addendum, Section 3.5.3.7** See item #11 above re 3.5.3.3.	See response to Item #11.	-	-
14	Cultural Heritage	**Draft EPR Addendum, Section 3.5.3.12** See item #11 above re 3.5.3.3.	See response to Item #11.	-	-
15	Archaeology	**Draft EPR Addendum, Section 3.5.4.3** See item #7 above re 3.3.4.9.	See response to Item #9.	-	-

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16	Archaeology	**Draft EPR Addendum, Section 3.5.4.6** See item #8 above re 3.3.4.9.	See response to Item #9.	-	-
17	Archaeology	**Draft EPR Addendum, Section 3.5.4.7** See item #8 above re 3.3.4.9.	See response to Item #9.	-	-
18	Archaeology	**Draft EPR Addendum, Section 3.5.4.12** See item #8 above re 3.3.4.9.	See response to Item #9. In addition, the existing text does advise of the presence of one previously registered archaeological site within 50 m.	-	-
19	Cultural Heritage	**Draft EPR Addendum, Section 3.6.3.3** See item #11 above re 3.5.3.3.	See response to Item #11.	-	-
20	Archaeology	**Draft EPR Addendum, Section 3.6.4.3** See item #7 above re 3.3.4.9.	See response to Item #9.	-	-
21	Archaeology	**Draft EPR Addendum, Section 3.6.4.4** See item #8 above re 3.3.4.9.	See response to Item #9.	-	-
22	Archaeology	**Draft EPR Addendum, Section 3.6.4.5** See item #8 above re 3.3.4.9.	See response to Item #9.	-	-
23	Archaeology	**Draft EPR Addendum, Section 3.6.4.6** See item #8 above re 3.3.4.9.	See response to Item #9. In addition, the existing text does advise of the presence of one previously registered archaeological site within 50 m.	-	-
24	Archaeology	**Draft EPR Addendum, Section 3.7.4.3** See item #8 above re 3.3.4.9.	See response to Item #9.	-	-
25	Archaeology	**Draft EPR Addendum, Section 3.7.4.8** See item #8 above re 3.3.4.9.	See response to Item #9.	-	-
26	Report Organization	**Draft EPR Addendum, Section 4** The way this section is organized is confusing. Sections 4.2 through 4.7 are presented as describing the impacts and mitigation measures generally for each of the study corridors, but they make reference to footprint impacts only, and are followed by operations and maintenance impacts in 4.8 and construction impacts in 4.9. Consider merging 4.8 and 4.9 into the study area-specific subsections of 4, or at least clarifying the organization. Further, the within the cultural heritage components of Sections 4.3 through 4.7, each study area is addressed as a fourth-level heading, but in each case where resources are present, they are discussed under a fifth-level heading titled “Potential Effects and Mitigation Measures”. Given that this one fifth-level heading contains all the content of its parent fourth-level heading, we recommend that the fifth-level heading be deleted and	The organizational structure of the ‘impact assessment’ discussions in EPR Addendum, Section 4 is consistent with the 2017 GO Rail Network Electrification EPR, and with MECP guidelines. As such, for continuity between project reporting the organization of the EPR Addendum shall remain as presented.	-	-

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		its content presented under the fourth-level heading for the study area.			
27	Cultural Heritage	**Draft EPR Addendum, Section 4.1** Under the "Cultural Environment Factor" bullet, the sub-bullet "Cultural Heritage Resources (built heritage resources and cultural heritage landscapes)" should be reworded to simply "Built Heritage Resources and Cultural Heritage Landscapes".	Acknowledged. Bullet has been revised, as requested.	-	-
28	Archaeology	**Draft EPR Addendum, Section 4.3.4.9.1, 4.5.4.12.1, 4.7.4.8.1, Potential Effects and Mitigation Measures** These sections note that a Stage 2 Archaeological Assessment will be conducted by a professionally licensed archaeologist "prior to disturbance". They should be revised to account for the possibility of Stage 3 and 4 assessments being required and specify that all additional archaeological work will be carried out as early as possible in the detail design stage.	Additional detail regarding possibility of Stage 3 and 4 assessments will be added and will note that they will be undertaken during detailed design.	-	-
29	Archaeology	**Draft EPR Addendum, Section 4.4.4.2.1, 4.5.4.6.1, 4.5.4.7.1, 4.6.4.4.1, 4.6.4.5.1, 4.6.4.6.1, 4.7.4.3.1** We recommend removing the word "compensation", as compensation is never part of mitigation recommendations for archaeological resources.	Acknowledged, references to "compensation" will be removed.	-	-
30	Cultural Heritage	**Draft EPR Addendum, Section 4.5.3.7.1** It is unclear what is meant by "from an electrification perspective, no impacts to these properties are anticipated". If the intended meaning is that the only anticipated impacts to these properties are from other related TPAP projects and captured in the documentation for those, please specify what EPRs or other documents describe these impacts and their mitigation measures.	The purpose of the GO Rail Network Electrification EPR Addendum is to address impacts associated with additional OCS infrastructure. The statement will be revised to: *"No direct or indirect impacts to the heritage attributes associated with these BHRs are anticipated as a result of the additional OCS infrastructure area."*	-	-
31	Cultural Heritage	**Draft EPR Addendum, Section 4.5.3.12.1** This section notes that "all OCS footprint impacts are anticipated to be contained within the existing right-of-way. As such, no direct impacts to this property are anticipated." This does not account for indirect impacts, which can be caused by the existence of new infrastructure footprint that does not directly encroach upon resources. Please elaborate.	Acknowledged. Additional details regarding anticipated indirect impacts as a result of construction related works (as noted in Table 4-44) will be added to Section 4.5.3.12.1	-	-
32	Archaeology	**Draft EPR Addendum, Section 4.5.4.12.1** Indigenous engagement, subject to the cultural associations of the archaeological site, is a requirement for Stage 3 archaeological assessment	Acknowledged. "Preferably" has been removed.	-	-

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		under the Standards and Guidelines for Consultant Archaeologists. We would therefore recommend removing the word "preferably" in the first paragraph.			
33	Archaeology	**Draft EPR Addendum, Section 4.9.4** As with item #28 above, this section should specify that the required additional stages of archaeological assessment will be carried out as early as possible in the detail design stage.	Acknowledged. This section will be revised for consistency with the changes made to address Item #28.	-	-
34	Cultural Heritage	**Draft EPR Addendum, Section 4.10 Table 4-44** "Cultural Heritage" should be replaced with "Built Heritage Resources and Cultural Heritage Landscapes" (or their acronyms) in the title of the table, the Environmental Component field, and the Potential Effect field of the second- and third-last rows.	Acknowledged. Table 4-44 will be updated accordingly.	-	-
35	Cultural Heritage	**Draft EPR Addendum, Section 4.10 Table 4-44** MHSTCI's 2019 guidance on *Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment* is intended to assist in the completion of reports of that type. It is not intended to assist in the execution of mitigation and monitoring measures. Its process and recommendations therefore should not be referenced under Mitigation and Monitoring Commitments.	Acknowledged. The reference will be deleted from Table 4-44 will be updated accordingly.	-	-
36	Cultural Heritage	**Draft EPR Addendum, Section 4.10 Table 4-44** The purpose of the row with "Potential indirect impacts on known or potential properties of CHVI resulting from construction activities" in the Potential Effect field is unclear, given that there are rows for each identified BHR and CHL and one for "any additional potentially affected … properties not previously identified".	Construction staging and laydown areas will be confirmed during future project phases. As such, this row provides additional mitigation/monitoring requirements with respect to the selection of construction staging and laydown areas. No change is proposed at this time.	-	-
37	Archaeology	**Draft EPR Addendum, Section 4.10 Table 4-45** The commitment to Stage 2 surveys should be noted under Mitigation Measures/Commitments, not Monitoring Commitments. It should also include a commitment to Stage 3 and 4 assessment work where recommended in the Stage 2 reports. The commitments should indicate that all of the outstanding archaeological assessment work will take place as early as possible in the detail design stage, not simply "prior to disturbance", including in the row for potential cemetery impacts.	Acknowledged. For consistency with the 2017 GO Rail Network Electrification EPR, the commitment for Stage 2 surveys will be included under both the Mitigation Measures/Commitments and Monitoring Commitments columns. Updates to Table 4-45 will be made accordingly.	-	-
38	Cultural Heritage	**Draft EPR Addendum, Section 6.5** The section should be retitled Built Heritage Resources and Cultural Heritage Landscapes.	Acknowledged, section title has been updated accordingly.	-	-
39	Archaeology	**Draft EPR Addendum, Section 6.6.1**	Acknowledged, wording has been revised accordingly.	-	-

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		The last sentence of the sixth bullet should be revised as follows: *"When all matters relating to archaeological sites within the project area of a development proposal have been addressed, and the archaeological report recommending no further concerns has been reviewed for consistency with the Standards and Guidelines for Consultant Archaeologists to the satisfaction of the Ministry of Heritage, Sport, Tourism and Culture Industries, a letter will be issued by the ministry referencing these recommendations and stating that ~~there are no further concerns with regard to alterations to archaeological sites by the proposed development~~* the report has been entered into the Ontario Public Register of Archaeological Reports."*			
40	Archaeology	**Draft EPR Addendum, Section 6.6.6** Please note typographical error in section title (state vs stage). The words "prior to commencement of construction" should be replaced with "as early as possible during detail design".	Typo in section heading has been corrected. It is noted that the "prior to commencement of construction" language is consistent with 2017 GO Rail Network Electrification EPR. However, the statement has been revised, as requested.	-	-
41	Archaeology	**Draft EPR Addendum, Section 6.6.7** Please remove the words "and/or construction". Required stages of archaeological assessment must be carried out well before construction and should be completed during detail design.	Acknowledged. Wording has been revised accordingly. .	-	-
42	Cultural Heritage	**Draft EPR Addendum, Appendix C** See attached letter. This document is not consistent with MHSTCI guidance or sufficient for addressing potential impacts on built heritage resources and cultural heritage landscapes, particularly in light of our outstanding concerns with the *Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment* for the New Track & Facilities TPAP. Further discussion will be necessary to ensure an appropriate format for this appendix.	It is acknowledged that the concerns presented in the attached letter regarding the contents of Draft EPR Addendum C, Cultural Heritage Technical Memorandum (July 2020) as it relates to comments previously provided by the MHSTCI on the related Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment for the New Track & Facilities TPAP. A response to and strategy for addressing outstanding MHSTCI concerns (as presented in May 2020 agency review comments) in relation to the New Track & Facilities technical cultural heritage report was issued in late September 2020. In order to avoid duplication of analysis between the New Track & Facilities TPAP and GO Rail Network Electrification Addendum, a Technical Memorandum approach was selected to document electrification impacts as a result of additional OCS infrastructure areas beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Assuming there are no outstanding concerns regarding the responses and report provisions provided as part of the New Track & Facilities TPAP in September 2020 and to address MHSTCI's concerns regarding the format of Draft EPR Addendum Appendix C, the memorandum will be reorganized and will include additional details under the following	We recently provided comments on the draft Cultural Heritage Report and three Heritage Impact Assessments. These are separate from the present correspondence.	Acknowledged. MHSTCI comments related to the USRC HONI Conflict Cultural Heritage Report and three Heritage Impact Assessment Reports have been reviewed by the Project Team and responses were issued January 13, 2021. Please refer to the attached correspondence. Updated versions of the reports and associated recommendations will be captioned within the Final EPR Addendum.

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			headings/sections to better align with MHSTCI guidance: • The Purpose, Project Scope and Scope and Methodology sections will be repackaged into "Project Overview, Purpose of this Memorandum, Description of Study Area, and Methodology" • The Summary of Findings section will be expanded to include "Historical Background, Existing Conditions (will include an Inventory of Known/Potential BHR/CHLs), Preliminary Impact Assessment, Summary of Mitigation and Monitoring Commitments, Recommendations/Next Steps, and Mapping in the Appendix" The existing conditions data presented in the memorandum will continue to be based on the results of the New Track & Facilities Cultural Heritage Report to avoid duplication of efforts. Should MHSTCI have any further questions or concerns regarding the approach outlined above, please feel free to let us know. The Project Team would also be happy to schedule a follow-up meeting to discuss the project in more detail, if needed.		

TABLE 5-16: MINISTRY OF NATURAL RESOURCES AND FORESTRY DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Natural Environment	**Natural Environment Impact Assessment Report, Section 2.2.2, Page 14,** Please update Table 2-2 to include FWCA in protection for all species of herpetofauna, invertebrates, fish (which includes molluscs), and bats. FWCA protects all species that are "wild by nature" and additional protection may be offered to designated species listed within FWCA Schedules. All fish species (including molluscs) are offered protection under FWCA and the Ontario Fishery Regulations under the Fisheries Act.	Reference to FWCA will be added to Table 2-2 for all species indicated.
2	Natural Environment	**Natural Environment Impact Assessment Report, Section 3.8, Page 53** Nests and eggs of active non migratory birds are also protected by the FWCA.	Reference to protection by FWCA will be added to Section 3.8.
3	Natural Environment	**Natural Environment Impact Assessment Report, Section 4.1, Page 59** Any capture/handling/release of fish, specially protected invertebrates, or wildlife (e.g. fish or wildlife rescues during any in-water works or damage/destruction of an active osprey nest) may require an authorization/licence under the Fish and Wildlife Conservation Act, 1997.	Reference to FWCA will be added to Section 4.1.
4	Natural Environment	**Natural Environment Impact Assessment Report, Section 3.7, Page 51** Has the project team considered through this Addendum or the previous electrification TPAP the operational impact of electromagnetic changes near high voltage lines on wildlife?	Potential impacts to birds related to the electrified aerial wires is addressed in Section 3.8.1.1.1. There is limited risk to birds associated with the OCS wires or supporting structures and birds will be able to perch on the wires without harm.

TABLE 5-17: ONTARIO GROWTH SECRETARIAT DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Project Scope	In general, OGS does not have specific concerns about the project, and is supportive of the intent to improve transit infrastructure along priority transit corridors as identified in Schedule 5 of the Growth Plan.	Acknowledged, Metrolinx appreciates the support.
2	Land Use	**Land Use & Socio-Economic Impact Assessment Report, Section 4** [this section] while acknowledging the Growth Plan, emphasizes the need to comply with the PPS. OGS would like to point out that compliance with the Growth Plan is a requirement, and not simply a more specific plan under the PPS. Section 1 of the Growth Plan, as provided for under the Places to Grow Act, 2005, reads: "The policies of this Plan take precedence over the policies of the PPS to the extent of any conflict, except where the relevant legislation provides otherwise. Where the policies of this Plan address the same, similar, related, or overlapping matters as policies in the PPS, applying the more specific policies of this Plan satisfies the requirements of the more general policies in the PPS."	Acknowledged, Section 4 will be revised to more clearly refer to the Growth Plan as described.

5.8.1.3 Municipal Review Agency Comments Received on Draft EPR Addendum

Table 5-18 to **Table 5-33** below contain comments (verbatim) submitted by each municipal review agency as well as how the comment was considered and responded to by Metrolinx.

TABLE 5-18: HALTON REGION DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Project Design – Beach and Walker's Line Layover Sites	It is noted in the draft EPR Addendum that there will be the further refinement and changes as Metrolinx is continuing to conduct assessments of these layover facilities. The Region reserves the right to provide additional comments when subsequent revisions are provided for review. Please note that the Region has provided comments on the layover facilities and the areas part of the New Track and Facilities TPAP (attached).	Metrolinx appreciates Halton Region's review of the Draft Environmental Project Report Addendum. Metrolinx can confirm that the Final EPR Addendum will be circulated, once available, and that the Region will continue to be consulted as the Project progresses. Comments provided as part of the New Track and Facilities TPAP have been reviewed and incorporated into the EPR Addendum, as necessary
2	Utilities	Halton Region's Water and Wastewater Planning Group have reviewed and note that potential utility conflicts have been summarized in Section 4.3.9.9 and Table 4.3. Some of the potential conflicts identified include Halton Region's existing water and wastewater infrastructure in the area of the Beach Layover site. Halton Region assumes that these potential conflicts are comprehensive and accurate, and that any potential conflicts will be managed accordingly throughout the various project phases so as not to cause any water and wastewater service disruptions or operational challenges for the Region.	Since the circulation of the Draft EPR Addendum, the Beach Layover has been removed from the proposed scope of work. As such, discussion of Beach Layover will be removed from the Final EPR Addendum and associated technical reporting.
3	Coordination	The Region looks forward to continued dialogue with the Project Team to ensure that the commitments included in EPR related to water and wastewater servicing requirements are satisfied during later project phases.	Thank you. Metrolinx looks forward to working with Halton Region through the subsequent phases of the project.

TABLE 5-19: CITY OF BURLINGTON DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Stormwater Management – Beach Layover	The beach layover facility is partly located within the Burlington Mobility Hub. Site's Access # 1 to Brant Street through Grays Lane is within the mobility hubs study area. The list of reports reviewed to prepare the traffic Impact plan does not include the Dillon's report. Please review the draft report to understand the long-term traffic planning associated with the intensification within the surrounding area (the area is a subject of an intensification study by the City of Burlington). It should be reviewed to confirm that the traffic generated by the facility fits in well with the long-term traffic planning for this area.	Thank you for your detailed feedback with respect to Stormwater Management. Since the circulation of the Draft EPR Addendum, the Beach Layover has been removed from the proposed scope of work. As such, discussion of Beach Layover will be removed from the Final EPR Addendum and associated technical reporting. For any follow-up inquiries regarding the Beach Layover, please contact the New Track and Facilities TPAP team.
2	Stormwater Management – Beach Layover	The site is surrounded by many sensitive and constrained drainage features. The study team must coordinate with the City staff for stormwater servicing of the site.	See response to Item 1 above.
3	Stormwater Management – Beach Layover	Utilizing rational formula to estimate flows is not appropriate. Since the site is much larger, please use a modeling software for more precise flow computations.	See response to Item 1 above.
4	Stormwater Management – Beach Layover	The report states, "It is worth noting that substantial alterations to the adjacent water features are anticipated based on the conceptual design developed as part of the TPAP". City will be looking for more information about the extent and degree of the proposed alterations to the local water features.	See response to Item 1 above.
5	Stormwater Management – Beach Layover	The preliminary Impact Assessment criteria and the proposed mitigation measures appear to have been prepared without consulting the City. It is strongly recommended that the City be consulted in finalizing the stormwater management plans for the facility.	See response to Item 1 above.
6	Stormwater Management – Beach Layover	Please clarify the disclaimer statement, "Routing calculations for sizing basins is not included". The context of this statement indicates that this assessment will be carried out at a later stage. Please clarify and provide details about the scope, nature and purpose of this future undertaking.	See response to Item 1 above.
7	Stormwater Management – Beach Layover	The study team identified baseline existing drainage conditions as their initial step towards the assessment of potential impacts. Please provide the source from which the baseline conditions were obtained.	See response to Item 1 above.
8	Stormwater Management – Beach Layover	The easternmost section the site is located within the lands proposed for redevelopment as part of the City's intensification plans around Burlington GO station. A detailed hydrologic analysis has recently been carried out that assessed the drainage features around the whole area and identified associated flood hazards. Flood mitigation measures for the Beach Layover site should be based on the findings of this study.	See response to Item 1 above.
9	Stormwater Management – Beach Layover	The proposed stormwater servicing of the site should align with the recommendations of the Area Specific Servicing Plans (confirm the name of the study).	See response to Item 1 above.
10	Stormwater Management – Beach Layover	Table 3-1:The City does not support enclosing open channels. Any realignment of the water courses through the site will require prior consultation with the City and the CH. A comprehensive study that assess the existing conditions and the potential impacts to hydrologic, hydraulic, fluvial, ecological and other environmental functions and processes.	See response to Item 1 above.

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
11	Stormwater Management – Beach Layover	Potential alterations to the local drainage system must be clearly outlined. The Hager-Rambo Diversion Channel is already deficient in fulfilling the current conveyance standards. Any alterations that could potentially impact the system capacity may not be very desirable solutions.	See response to Item 1 above.
12	Stormwater Management – Beach Layover	Please note, all drainage features around the site are very sensitive and constrained. Assessment of the impacts to the drainage features must extend upstream and downstream beyond the site boundaries to prevent any adverse impacts.	See response to Item 1 above.
13	Stormwater Management – Beach Layover	Section 3.3: Please include the City's new Stormwater Management Design standards in the list of the documents to be reviewed and followed in preparation of the site stormwater servicing.	See response to Item 1 above.
14	Stormwater Management – Beach Layover	The City has recently updated the IDF's. Please use the latest updated IDF relationships for infrastructure assessment and design.	See response to Item 1 above.
15	Stormwater Management – Beach Layover	Direct discharge into the existing pipe network will only be permitted subject to available capacity.	See response to Item 1 above.
16	Stormwater Management – Beach Layover	Any external flows entering the site must continue to be safely routed through the site under developed conditions.	See response to Item 1 above.
17	Stormwater Management – Beach Layover	Only an ETV certified oil grit separator will be approved. Any OGS device will only be credited at 50% TSS removal. The remainder quality target must be met through a treatment approach using alternative treatment methods.	See response to Item 1 above.
18	Stormwater Management – Beach Layover	A very robust and a fail-proof treatment system will be required that removes oil contamination from the runoff off the layover tracks. City of Burlington's storm sewer discharge by-law must be followed in this regard.	See response to Item 1 above.
19	Stormwater Management – Beach Layover	If the runoff is proposed to be directed to the sanitary sewers an approval from the Region of Halton will be required.	See response to Item 1 above.
20	Stormwater Management – Beach Layover	Depending on the sensitivity of the receiving channels, greater runoff retention (above the proposed 5mm) may be required.	See response to Item 1 above.
21	Stormwater Management – Beach Layover	Details of the proposed cut-fill must be discussed with the review agencies at the start of the design.	See response to Item 1 above.
22	Stormwater Management – Beach Layover	The stormwater management practices listed in section 3.3 appear to be a generalized list and not specifically related to the Beach Layover site. A more site-specific stormwater management plan will be required.	See response to Item 1 above.
23	Stormwater Management – Beach Layover	The Metrolinx Climate Change Initiative requirement to account for the future anticipated climate change by including a 25% increase to the currently adopted IDF's is greatly appreciated.	See response to Item 1 above.
24	Stormwater Management – Beach Layover	It appears there is a history of agency coordination. The report mentions site walk with the CH staff on Dec 13th, 2019. Was the City involved at any stage? Did anybody from the City participate in the site walk and was there any input from the city in the preliminary design process? I am particularly interested to coordinate with the staff who assisted in preparation of the baseline drainage conditions.	See response to Item 1 above.
25	Stormwater Management – Beach Layover	How will the Tributary B, which passes through the site and carries flow from a 50-ha external catchment. Will this be retained in its present configuration. A hydraulic analysis will be required to confirm floodlines and to establish setbacks.	See response to Item 1 above.

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
26	Stormwater Management – Beach Layover	The City of Burlington has separate storm and sanitary sewer systems. Surface storm runoff is not permitted to be discharged into sanitary lines.	See response to Item 1 above.
27	Stormwater Management – Beach Layover	Under the developed conditions the stormwater receivers must not receive runoff in excess of the predevelopment amounts.	See response to Item 1 above.
28	Stormwater Management – Beach Layover	The report presents a preliminary and a conceptual layout of the drainage catchments and their impervious percentages. It will be a subject of detailed review when the site design is firmed up.	See response to Item 1 above.
29	Stormwater Management – Beach Layover	A more in-depth hydrologic analysis using an acceptable simulation software should be used for flow computations. The rational formula is not appropriate for this site (11ha).	See response to Item 1 above.
30	Stormwater Management – Beach Layover	A hydraulic analysis is required for both tributaries A and B. All development must stay at an appropriate setback from erosion and flood hazards.	See response to Item 1 above.
31	Stormwater Management – Beach Layover	City of Burlington requires the existing conditions imperviousness to be no more than 50%. The City may consider removing this condition if the Metrolinx Climate Change initiative of 25% increase is applied to flows.	See response to Item 1 above.
32	Stormwater Management – Beach Layover	Bio-swales are acceptable as a low impact development feature which provides quality treatment. The City does not credit bio-swale infiltration towards quantity control requirements.	See response to Item 1 above.
33	Stormwater Management – Beach Layover	Section 4.3 page 21, 2nd paragraph: "Ongoing coordination with the City of Burlington notes that the site drainage shall be treated on site and discharged into the municipal sewer system at Gray's Lane due to complications related to existing infrastructure on-site". The complications related to the existing infrastructure needs to be explained further. Also, please provide the contact at the City who was contacted in this regard.	See response to Item 1 above.
34	Stormwater Management – Beach Layover	A meeting with the City and the CH is strongly recommended to discuss the channel enclosure option. This meeting should be held in advance of the design process.	See response to Item 1 above.
35	Stormwater Management – Beach Layover	A meeting with the City and the CH is strongly recommended to discuss the channel enclosure option. This meeting should be held in advance of the design process.	See response to Item 1 above.

TABLE 5-20: REGION OF PEEL DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	General	Thank you for following up. Regional staff have no additional comments however the general comments attached which were provided in response to the Draft EPR continue to stand for the addendum.	Thank you for confirming receipt of the draft Electrification EPR Addendum. We can advise that the New Track & Facilities Project Team received the comments and a response was issued in late September 2020. The comments will also be considered when finalizing the Electrification EPR Addendum. We very much appreciate the Region of Peel's review. We look forward to your continued involvement in this Project.

TABLE 5-21: CITY OF BRAMPTON DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Project Infrastructure - OCS Attachments	**Draft EPR Addendum, Section 2.2.1** The report draft states "Furthermore, OCS attachments to third party property along the corridors is not anticipated based on the conceptual design. Notwithstanding this, the need for any attachments will need to be verified during detailed design based on the established track configurations." Please be guided by City's earlier comments and Metrolinx's response as part of the GO Rail Network Electrification TPAP (2017) EPR Vol 4, (Pg. 261&262), related to the Bramalea Rd bridge structure. Please also be guided by City's comments related to the Bramalea Rd bridge structure as part of New Track & Facilities draft EPR in April 2020, and May & June 2020. Please contact Tim Kocialek, Manager of Engineering, Capital Works email tim.kocialek@brampton.ca; Tel (905) 874-2541	Metrolinx's Third Parties and Agreements Team is awaiting further outcomes from negotiations with CN (who owns the portion of the corridor over which the Bramalea RD bridge crosses). Once there are any outcomes resulting from the negotiations, Third Parties and Agreements Team will resume communications with Brampton's Tim Kocialek, Manager of Engineering, Capital Works. Previous commitments made as part of the 2017 GO Rail Network Electrification TPAP will continue to be upheld and carried forward as part of the GO Rail Network Electrification Addendum.
2	Project Infrastructure - OCS Attachments	The City is currently conducting a Municipal Class EA for improvements to Bramalea Road including the segment crossing the CN Rail corridor. Please coordinate with Brampton's EA Team - contact Mario Goolsarran, Senior Project Engineer, Infrastructure Planning, email Mario.Goolsarran@brampton.ca; Tel (905) 874-5164	Acknowledged. Further to the response above, Mario Goolsarran, Senior Project Engineer, Infrastructure Planning will also be contacted when Metrolinx is in a position to resume communications. Previous commitments made as part of the 2017 GO Rail Network Electrification TPAP will continue to be upheld and carried forward as part of the GO Rail Network Electrification Addendum.
3	Air Quality	**Draft EPR Addendum, Section 3.4.6 & Appendix F** The draft report notes that the Study is currently in progress. City looks forward to reviewing this study.	Acknowledged. Metrolinx is currently planning a 3rd round of Public Open Houses which will be hosted virtually late November / early December. Project contacts will receive email notification in advance of the public open houses providing further details. A summary of key findings and recommended mitigation measures and monitoring commitments will be presented. Draft technical studies, where available, will also be posted for review. The final EPR Addendum will include updated information regarding the findings of the system-wide Air Quality Assessment Studies associated with increased service levels.
4	Noise & Vibration	**Draft EPR Addendum, Section 3.4.7 & Appendix G** The draft report notes that the Study is currently in progress. City looks forward to reviewing this study.	Acknowledged. Metrolinx is currently planning a 3rd round of Public Open Houses which will be hosted virtually late November / early December. Project contacts will receive email notification in advance of the public open houses providing further details. A summary of key findings and recommended mitigation measures and monitoring commitments will be presented. Draft technical studies, where available, will also be posted for review. The final EPR Addendum will include updated information regarding the findings of the system-wide Noise & Vibration Assessment Studies associated with increased service levels.
5	Cultural Heritage & Archaeology	According to our records, the information presented in the Draft EPR Addendum and the supporting Appendices is accurate.	Acknowledged. Thank you for confirming.
6	Utilities	There are 4 PSN crossing on the Kitchener Corridor in the City of Brampton. For additional information please contact Marc Flores, Network Administrator Cable Plant / Public Sector Network at Marc.Flores@brampton.ca; Tel 905.874.2022	Acknowledged. Metrolinx is currently in the process of completing a Due Diligence Exercise which will review additional OCS infrastructure areas to determine any utility conflicts. Metrolinx will continue to involve the City of Brampton during detailed design with regard to any utility conflicts or relocations.

TABLE 5-22: CITY OF MISSISSAUGA DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Project Scope – Kitchener Corridor	**Draft EPR Addendum, Section 2.1.3, Table 2-3** It is noted that portions of the 7 m vegetation zone fall outside of the 2017 Electrification Study area. Please advise of the impacted properties within Mississauga and notification prior to any vegetation clearing.	Previous commitments made as part of the 2017 GO Rail Network Electrification TPAP will continue to be upheld and carried forward as part of the GO Rail Network Electrification Addendum. An Updated Conceptual Electrification Corridor Plan for the Kitchener Corridor is provided as Appendix N2. Specifically Figures KT-1, KT-6 and KT-7 illustrate the locations of the EPR Addendum Study Area beyond the 7 m OCS/Vegetation Removal Zone identified in 2017. As noted in Section 2.3 of the EPR Addendum, OCS pole foundations can generally be accommodated within Metrolinx owned rail ROW, and no property impacts/conflicts are anticipated due to the placement of OCS infrastructure along the corridors. In cases where there are "pinch points" and the OCS Impact Zone falls outside of Metrolinx owned ROW, an engineering solution will be implemented during detailed design to avoid property impacts. If either property impacts or the need for attachments are identified during detailed design, Metrolinx will proceed with the acquisition/easement in accordance with Metrolinx's approved property acquisition process. If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2020), available at the following link: https://www.metrolinxengage.com/sites/default/files/mx_vegguide-final_draft_s001-gen-7761-005_reduced_size.pdf Metrolinx will consult with adjacent landowners in advance should vegetation removal be required outside of the existing Metrolinx right-of-way.

TABLE 5-23: CITY OF TORONTO DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx	CoT Follow Up Comment (December 2020)	How Comment was Considered by Metrolinx (January 12, 2021)
1	General – Incomplete Studies	Please provide the following missing appendices for City of Toronto review once available: - Appendix F: Air Quality Assessment Report, - Appendix G: Noise and Vibration Modeling Reports, - Appendix O: Mapping of Noise/Vibration Receptors and Recommended Locations of Noise/Vibration Mitigation. These reports are required to ensure accurate review and comment on impacts and proposed mitigation.	Acknowledged. The final EPR Addendum will include additional information for studies, such as Air Quality and Noise & Vibration that were in progress at the time of the Draft EPR Addendum circulation in August 2020. Metrolinx is currently planning a 3rd round of Public Open Houses which will be hosted virtually late November / early December. Additional information regarding Air Quality and Noise & Vibration study results, including locations of proposed noise/vibration mitigation will be presented. Project Contacts will receive email notification in advance of the public open houses providing further details. Metrolinx will be providing the draft Air Quality and Noise & Vibration studies to the City of Toronto for review prior to the 3rd round of Public Open Houses.	Status: Pending review of available Air Quality and Noise and Vibration studies. The CoT is reviewing the Air Quality and Noise and Vibration studies provided by Mx (Mirjana Osojnicki) on November 24th, 2020 and subsequently uploaded to the Mx Engage website on November 27th, 2020. Comments on these reports will be provided in due course under separate cover.	Acknowledged. Metrolinx received comments from CoT on January 7th 2021.
2	Utilities	**Draft EPR Addendum, Sections 3.3.9 & 3.3.9.2; 3.5.9 & 3.5.9.3; 3.7.9 & 3.7.9.3** Provide results of Due Diligence Exercise re: utility conflicts, for City of Toronto review once available.	Acknowledged. Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum. Metrolinx will continue to involve the City of Toronto during detailed design with regard to any utility conflicts or relocations. It is noted that the New Track & Facilities TPAP prepared and previously circulated a draft Utility Impact Assessment Report to the City of Toronto earlier this year. The report is currently being revised and the final report will be provided to the City of Toronto, once available.	Status: Deferred until results of due diligence exercise undertaken during detailed design are provided for CoT review and comment. In regard to the NTF Utility Impact Assessment Report, the CoT will review and provide comments upon receipt of the updated report.	Acknowledged. The New Track & Facilities TPAP issued a Notice of Completion on December 29, 2020. A copy of the EPR and associated technical studies can be viewed at: https://www.metrolinxengage.com/en/content/new-track-facilities-environmental-project-report
3	Environmental Site Assessment	**Draft EPR Addendum, Sections 4.3.2 & 4.3.2.2.1; 4.4.2 & 4.4.2.1; 3.5.2 & 3.5.2.3; 3.7.2 & 3.7.2.3** Provide results of Due Diligence Study re: potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies for City of Toronto review once available.	Acknowledged. Phase 1 Due Diligence work is being completed by the New Track & Facilities team and is separate from the EPR Addendum. Results of Phase 1 ESA Due Diligence reporting within the City of Toronto will be shared with the City of Toronto for information, once available.	Status: Pending receipt of the Phase 1 ESA report from the New Tracks and Facilities Team for the CoT's review and comment.	Acknowledged. The New Track & Facilities TPAP issued a Notice of Completion on December 29, 2020. A copy of the EPR and associated technical studies can be viewed at: https://www.metrolinxengage.com/en/content/new-track-facilities-environmental-project-report
4	Natural Environment	**Draft EPR Addendum, Section 3.4.1 and 3.4.1.1.1.1** Please confirm there is no anticipated footprint impacts to the following unevaluated wetlands 1) near the western boundary, 2) present in Mimico Creek Valley and 3) near the riparian area in the vicinity of the western terminus.	Draft Natural Environment Impact Assessment Report, Appendix B Terrestrial Data Figures KT-1, KT-3 and KT-4 identify the impact area in relation to mapped unevaluated wetlands. There are no anticipated impacts to these areas. Any potential impacts to unevaluated wetlands will be confirmed during detailed design. Mitigation measures will be implemented per the standard commitment tables included in the EPR Addendum and in consultation with TRCA.	Status: Deferred, any impacts to unevaluated wetlands identified during detailed design to be reviewed by the CoT. The CoT notes that Mx has indicated there are no anticipated impacts to these areas based on preliminary designs.	Acknowledged.
5	Natural Environment	**Draft EPR Addendum, Section 4.4.1 and 4.4.1.1.1.3**	Given no impacts to culverts or bridges are anticipated to result from the proposed Addendum works, no additional barn swallow survey requirements	Status: Closed.	Acknowledged.

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		Previous Barn Swallow surveys were conducted in 2017, please provide clarification on if there will be any additional nest surveys completed before construction commences.	were identified. That said, general commitments/best practices for construction for this species has been identified in EPR Addendum, Table 4-42 and Section 6.7.6.3. All works will be completed in compliance with the Migratory Birds Convention Act. It is noted commitments made as part of the 2017 GO Rail Network Electrification EPR will continue to be upheld.		
6	Natural Environment	**Draft EPR Addendum, Section 3.7.1 and 3.7.1.3.1.3** Please confirm the mitigation measures that will be used for the WOD and CGL communities in order to avoid potential impacts to breeding birds populations.	As noted in the impact assessment discussion provided in Draft EPR Addendum, Section 4.7.1.3.1.1 the OCS Impact / Vegetation Clearance Zone for the Addendum works are limited to Commercial and Institutional (CVC) and Transportation and Utilities (CVI) communities. However, mitigation measures and monitoring commitments related to the protection of breeding birds and compliance with the *Migratory Bird Convention Act (MBCA)* are identified in Draft EPR Addendum Section 4.9, Table 4-41 and Table 4-42. It is noted commitments made as part of the 2017 GO Rail Network Electrification EPR with respect to impacts to Deciduous Woodland (WOD) and Green Land (CGL) communities within Segment LSE-3 will continue to be upheld.	Status: Closed.	Acknowledged.
7	Land Use	**Draft EPR Addendum, Section 3.7.5 & 3.7.5.3.1** Please confirm why Scarboro Golf and Country Club, Natal Park and McCowan District Park were not identified as recreational amenities in Section 4.7.5.3.2 when they were identified as such in the Baseline Conditions.	The Baseline Conditions discussion provided a broader description of existing conditions within and adjacent to the Metrolinx rail corridor within Segment LSE-3. Scarboro Golf and Country Club and Natal park will not be directly impacted by the proposed Addendum works and are located more than 200m from the Addendum study area. To avoid confusion, Section 3.7.5 has been revised to remove references to these recreational amenities.	Status: Pending review of the final EPR Addendum, once available. Clarification noted regarding Scarboro Golf and Country Club and Natal park. The original comment also inquired as to McCowan District Park. Please confirm if the response provided is also applicable to this location.	McCowan District Park was identified in Draft EPR Addendum, Section 4.7.5.3.2 and it was noted that no adverse impacts to the recreational amenity are anticipated. Since this recreational amenity is located within 200 m of the Addendum study area it will continue to be referenced and captioned within the EPR Addendum.
8	Property Access	**Draft EPR Addendum, Appendix N: Concept Corridor Plans** Please confirm that property access along corridor will be maintained for section LSE-3.	No changes to property access within Section LSE-3 with respect to the additional OCS infrastructure (as shown on Figure LSE-22) is required as part of the GO Rail Network Electrification Addendum. If City of Toronto has a specific location of interest, please provide clarification. Based on the current design there are no anticipated land use impacts. As noted in Section 2.3 of the EPR Addendum, OCS pole foundations can generally be accommodated within Metrolinx owned rail ROW, and no property impacts/conflicts are anticipated due to the placement of OCS infrastructure along the corridors. In cases where there are "pinch points" and the OCS Impact Zone falls outside of Metrolinx owned ROW, an engineering solution will be implemented during detailed design to avoid property impacts. If either property impacts or the need for attachments are identified during detailed design, Metrolinx will proceed with the acquisition/easement in accordance with	Status: Open, further clarification required from Mx. Information regarding OCS property impacts is noted. The area of concern raised in the original comment is the property shown on LSE-22, north of the rail corridor, south of Eglinton Ave and east of McCowan Road. It is unclear from the image whether or not the property's parking area is impacted by the Electrification EPR Addendum Study Area.	The EPR Addendum Study area is shown in red hatching in Appendix N mapping. There is no EPR Addendum Study area shown on Figure LSE-22 north of the rail corridor, south of Eglinton Ave and east of McCowan Road. This portion of the LSE corridor was previously assessed as part of the 2017 GO Rail Network Electrification EPR. As noted in our initial response, and documented in the 2017 EPR, Volume 1, OCS pole foundations can generally be accommodated within Metrolinx owned rail ROW, and no property impacts/conflicts are

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			Metrolinx's approved property acquisition process. Metrolinx will certainly look for opportunities to minimize the footprint of our transit expansion infrastructure where possible. This includes looking for opportunities to integrate OCS infrastructure with other infrastructure such as retaining walls. It is noted that the electrification of the Midland Layover proposed as part of the Scarborough Junction Grade Separation (SJGS) TPAP has been added to the proposed scope of work. The assessment of electrification impacts at the Midland Layover will rely on technical studies, including natural environment and stormwater management reports completed as part of the SJGS TPAP.		anticipated due to the placement of OCS infrastructure along the corridors. In cases where there are "pinch points" and the OCS Impact Zone falls outside of Metrolinx owned ROW, an engineering solution will be implemented during detailed design to avoid property impacts. If either property impacts or the need for attachments are identified during detailed design, Metrolinx will proceed with the acquisition/easement in accordance with Metrolinx's approved property acquisition process. Metrolinx will certainly look for opportunities to minimize the footprint of our transit expansion infrastructure where possible. This includes looking for opportunities to integrate OCS infrastructure with other infrastructure such as retaining walls.
9	EMI EMF	**Draft EPR Addendum, Section 3.6.10.1** The report (3.6.10.1) identifies EMI receptor sites within the Kitchener and Lakeshore West Corridors, however these sections only apply to areas outside of the City of Toronto. Please confirm that there are no sensitive receptor sites within the City of Toronto portion of the Kitchener and Lakeshore West Corridors, similar to the statement provided for the Barrie and Lakeshore East Corridors (as per page 57 & 112).	Confirmed. No EMI sensitive sites were identified along the Kitchener and Lakeshore West Corridors in the City of Toronto within the EPR Addendum study area.	Status: Closed.	Acknowledged.
10	EMI EMF	**Draft EPR Addendum, Section 6.16.7** Further guidance is available on best practices published by UK Rail Safety & Standards Board (RSSB). It is recommended that Metrolinx refer to the document titled "Guidance on the Application of the Control of Electromagnetic Fields at Work Regulations" (GL/GN/1620).	Acknowledged. It is noted that the EMI/EMF Assessment and associated recommendations for the GO Rail Network Electrification project draws from the same root source (i.e. International Commission on Non-Ionizing Radiation Protection) with respect to physical quantities related to EMFs, including ALs (action limits) and ELVs (exposure limit values) as the "Guidance on the Application of the Control of Electromagnetic Fields at Work Regulations" document. Additional Best Practices have been reviewed and added to Section 6.16.7.	Status: Pending review of the final EPR Addendum, once available.	Acknowledged.
11	USRC HONI Conflicts	**Draft EPR Addendum, Sections 2.1.1 and 3.2.3** Provide Addendum requirements (i.e. CHAR, HIAS, etc.) regarding the USRC HONI conflicts scope of work to the City of Toronto for review and comment, once available.	Since the circulation of the Draft EPR Addendum in August 2020,-Metrolinx circulated the draft USRC Significant Addendum Memo and associated HIA reports to the City for review and City comments have been received. Subsequent to receipt of City comments, it was identified that there is uncertainty regarding the preferred Ontario Line (OL) Subways alignment and the Lower Don Bridge design in the USRC. The proposed location of the additional steel mid-span steel monopole structure is dependent on the OL alignment and therefore cannot be confirmed at this time. In order to de-risk the	Status: Pending review of the final EPR Addendum and Mx responses on HIA reports and USRC Significant Addendum Memo comments, once available. It is noted that details of the Lower Don Bridge design require further consideration and coordination with the OL team.	Acknowledged. Mx issued responses to City of Toronto comments on the USRC HONI Conflicts Significant Addendum Memo on January 5th, 2021. Responses to the City comments on the draft USRC Subways HIA Reports are appended to this GRT comment response. A future EA addendum will be completed for the

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			project, the additional mid-span steel monopole will be de-scoped from the USRC HONI Conflicts Significant Addendum Memo and GO Rail Network Electrification EPR Addendum to allow for a feasible design solution to be achieved. An acknowledgement of this conflict will be included in the memo and EPR Addendum. Metrolinx Electrification Team is coordinating with the Ontario Line Team and will continue to engage the City of Toronto regarding EA approvals and design. Discussions remain ongoing, however comments provided to date will be considered and incorporated within the design and associated technical reporting, as appropriate. Metrolinx is not proposing any changes to the remaining scope of the USRC HONI Conflicts Addendum, including the Hydro One surface trough from Esplanade Transmission Station to Don Fleet Junction and utility bridges at Lower Sherbourne Street USRC Subways, Parliament St USRC Subway and Cherry St USRC Subway. The surface trough and utility bridges are included in the Wilson Yard 95% Design and will continue to be included in the USRC HONI Conflicts Significant Addendum Memo and the GO Rail Network Electrification Addendum.	The CoT acknowledges the northern HONI tower structure (mid-span steel monopole) has been removed from USRC HONI Conflicts Significant Addendum Memo and Electrification EPR Addendum scope. The impacts associated with this structure need to be assessed and appropriate mitigations outlined in a separate Significant TPAP Addendum for the CoT review, and these need to be communicated to the Councillors and the Public.	additional mid-span steel monopole structure. EA Significance and a communications strategy will be determined at that time.
12	Scope – Wilson Yard	**Draft EPR Addendum, Appendix E** Does this addendum address any of the design changes made to Wilson Yard as compared to the Electrification 2017 TPAP and/or the USRC East 2018 TPAP?	No. A separate Insignificant Addendum was completed by Metrolinx in November 2018 to address the electrification of the Wilson Yard. It is noted that as part of the Final EPR Addendum, Appendix N (Concept Corridor Plans) mapping for USRC will be provided, which will reflect the updated OCS Impact / Vegetation Clearance Zone. Subsequent to receipt of City comments, it was identified that there is uncertainty regarding the preferred Ontario Line (OL) Subways alignment and the Lower Don Bridge design in the USRC. The proposed location of the additional steel mid-span steel monopole structure is dependent on the OL alignment and therefore cannot be confirmed at this time. In order to de-risk the project, the additional mid-span steel monopole will be de-scoped from the USRC HONI Conflicts Significant Addendum Memo and GO Rail Network Electrification EPR Addendum to allow for a feasible design solution to be achieved. An acknowledgement of this conflict will be included in the memo and EPR Addendum. Metrolinx Electrification Team is coordinating with the Ontario Line Team and will continue to engage the City of Toronto regarding EA approvals and design. Discussions remain ongoing, however comments provided to date will be considered and incorporated within the design and associated technical reporting, as appropriate. Metrolinx is not proposing any changes to the remaining scope of the USRC HONI Conflicts Addendum, including the Hydro One surface trough from Esplanade Transmission Station to Don Fleet Junction and utility bridges at Lower Sherbourne Street USRC Subways, Parliament St USRC Subway and Cherry St USRC Subway. The surface trough and utility bridges are included in the Wilson Yard 95% Design and will continue to be included in the USRC HONI Conflicts Significant Addendum Memo and the GO Rail Network Electrification Addendum.	Status: Pending review of the final EPR Addendum and Appendix N (Concept Corridor Plans), once available. It is noted that details of the Lower Don Bridge design require further consideration and coordination with the OL team. The CoT acknowledges that this has been removed from USRC HONI Conflicts Significant Addendum Memo and Electrification EPR Addendum scope. The impacts associated with this structure need to be assessed and appropriate mitigations outlined in a separate Significant TPAP Addendum for the CoT review, and these need to be communicated to the Councillors and the Public.	Acknowledged. A separate addendum will be completed for the additional mid-span steel monopole structure. The Project Team is coordinating with the Ontario Line team.
13	Vegetation Removals	**Natural Environment Impact Assessment Report, Section 2.2.1**	Metrolinx, as a Provincial Agency, is not subject to municipal permits and approvals, including compensation requirements, for tree removals within	Status: Response regarding EPR Addendum is Closed.	Acknowledged.

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		All bylaw regulated trees located in RNFP areas will be subject to the appropriate municipal compensation ratio, not ecological compensation, regardless of ownership. Removals are 3:1 and injuries are 1:1 in RNFP regulated areas in the City of Toronto, including rail corridors. PF&R provided similar comment in the OnCorr Veg Removal & Comp Plans comment log submitted to Mx on May 28th, 2020. Responses from Mx remain outstanding.	Metrolinx owned property. Trees within the Metrolinx ROW will be compensated for using the approach developed specifically for Metrolinx as outlined in the Vegetation Guideline (2020). Draft EPR Addendum, Section 6.7.5 notes the following: *"Compensation will follow one or a combination of the following approaches: ecological, baseline, or bylaw.* • ***For Trees within Metrolinx Property**: All trees within the Metrolinx ROW will be compensated for using either an ecological or baseline approach. Where tree removals are located within a designated natural area, ecological compensation will be implemented. Where removals are outside a designated natural area, a 1:1 ratio approach will be implemented (baseline compensation).* • ***For Public/Private Trees**: Compensation for trees within public and private lands, including those on the boundary between the Metrolinx ROW and public or private lands, will follow with the requirements of applicable bylaws and regulations. Trees on public or private lands that are not subject to bylaws/regulations will be compensated for following an ecological or baseline approach. Metrolinx will work directly with residents to address the loss of trees on private property."* It is noted that the development of Metrolinx's Vegetation Guideline is outside the scope of the GO Rail Network Electrification Addendum. The Metrolinx Vegetation Team provided responses to the May 28th, 2020 comments on Nov. 11, 2020. The CoT comments on the Vegetation Guideline have been addressed in the final Guideline document.	However, the CoT still requires follow up with Mx regarding the Vegetation Guidelines. Note, this matter is being escalated to Steering Committee and/or Program Group for resolution.	Ongoing discussions with the Metrolinx Vegetation Team regarding the development of the Vegetation Guideline is outside the scope of the GO Rail Network Electrification Addendum.
14	Natural Environment	**Natural Environment Impact Assessment Report, Table 2-1** All mitigation measures shall be explored to minimize the impact to RNFP regulated areas and areas containing woodland/forest communities	Table 2-1 is intended to provide a summary of impacted ELC communities and associated categories of potential ecological impacts to provide a framework for the impact analysis in the subsequent sections of the report. Specific reference to individual municipal bylaws/regulations, such as the City of Toronto's Ravine and Natural Feature Protection (RNFP) regulated area in this table is not applicable. OCS footprint impacts are anticipated to be contained within the existing Metrolinx ROW. Further discussion of removals within RNFP limits will be provided, where appropriate, within associated corridor Natural Environment 'Designed Areas' subsections. Vegetation removal will be minimized to the greatest extent possible. For tree removals outside of Metrolinx lands, all regulatory requirements for tree removals including municipal permits and approvals will be adhered to. This includes compensation as per the applicable by law. This is consistent with the Metrolinx Vegetation Guideline (2020).	Status: Pending review of Natural Environment "Designed Areas" subsections and system-wide Arborist Report, once available. Note, anywhere within the City of Toronto, compensation levels are governed by RNFP boundary limits and municipal bylaw compensation ratios would apply.	Acknowledged. Based upon our assessment, there will be no vegetation removals within RNFP regulated areas as part of the GO Rail Network Electrification Addendum footprint, which is further detailed within the updated Natural Environment Impact Assessment Report.
15	Natural Environment	**Natural Environment Impact Assessment Report Table 5-1 and Draft EPR Addendum Table 4-41** Typo. Asian **Long**horn Beetle	Noted. Revision has been made.	Status: Closed.	Acknowledged.
16	Natural Environment	**Natural Environment Impact Assessment Report, Table 5-2** Typo. 4th bullet. Should read "If the nest of a protected…"	Noted. Revision has been made.	Status: Closed.	Acknowledged.

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17	Natural Environment	All bylaw regulated trees located in RNFP areas will be subject to the appropriate municipal compensation ratio, not ecological compensation, regardless of ownership. Removals are 3:1 and injuries are 1:1 in RNFP regulated areas in the City of Toronto, including rail corridors. PF&R provided similar comment in the OnCorr Veg Removal & Comp Plans comment log submitted to Mx on May 28th, 2020. Responses from Mx remain outstanding.	See response to Comment #13.	Status: See follow up comment to Comment #13 above.	Acknowledged. See follow up response to Comment #13 above.
18	Natural Environment	**Draft EPR Addendum, Table 4-41** Typo 3rd & 10th bullet: **regulations**	Noted. Revision has been made.	Status: Closed.	Noted.
19	Natural Environment	**Draft EPR Addendum, Section 6.7.3** 2nd bullet: "The Arborist report will include all information needed to establish compensation **ratios**…"	Noted. Revision has been made.	Status: Closed.	Noted.
20	Natural Environment	**Draft EPR Addendum and Natural Environment Impact Assessment Report, Glossary of Terms** There should be a term and definition for 'Compensation Measure' related to vegetation and for overall project impacts and compensation measures as noted in Section 1.4.	Noted. Recommendation has been incorporated.	Status: Pending review of the final EPR Addendum, once available.	Noted.
21	Natural Environment	Terrestrial section speaks to the Vegetation Compensation Framework. PF&R provided comments on the Mx Vegetation Guideline 2020 document and are seeking confirmation that those comments have been addressed.	Compensation will be undertaken in accordance with Metrolinx's Vegetation Guideline (2020). A copy of the finalized document can be viewed at the link provided below: https://www.metrolinxengage.com/sites/default/files/mx_vegguide-final_draft_s001-gen-7761-005_reduced_size.pdf Development of Metrolinx's Vegetation Guideline is outside the scope of the GO Rail Network Electrification Addendum. The Metrolinx Vegetation Team provided responses to the May 28th, 2020 comment on Nov. 11, 2020. The CoT comments on the Vegetation Guideline have been addressed in the final Guideline document.	Status: Open. Vegetation removal and compensation matters to be escalated to Steering Committee and/or Program Group for resolution. Comment on this matter deferred until further information is available.	Ongoing discussions with the Metrolinx Vegetation Team regarding the development of the Vegetation Guideline is outside the scope of the GO Rail Network Electrification Addendum
22	Natural Environment	**Draft EPR Addendum, Section 6.3** What is Mx plan for obtaining UF permits. Will information be submitted as one complete project? This should be negotiated with UF to determine an	Acknowledged. Permits/approvals associated with tree removal or injury will be undertaken as part of future project phases. Metrolinx will continue to engage Urban Forestry as more specific details become available for removals on public/private lands. It is agreed that a streamlined approach is preferable.	Status: Open. Please confirm who shall be submitting UF permit application. In addition, confirm whether the applications will be prepared and submitted on a system-wide or site-	As noted previously, specifics regarding permit applications for any tree removal or injury beyond Metrolinx's ROW on public/private lands will be confirmed during future project phases. Metrolinx/Project Co. will continue to engage Urban Forestry as more specific details become available

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		appropriate and manageable intake and review process.		specific basis.	to reach a mutually agreeable and manageable approach for the submission, review and approval of permit applications.
23	Natural Environment	**Draft EPR Addendum, Tables 4.6 to 4.9 and NE IA Report Tables 2.2 to 2.6** EPR shall note whether any lands within the 7m vegetation zone beyond the 2017 TPAP study area are within RNFP limits within the City of Toronto. Confirm how this addendum will feed into the evaluations and calculations of vegetation removals being completed by the OnCorr PDT overseeing vegetation removals and compensation.	Further discussion of removals within RNFP limits will be provided, where appropriate, within associated corridor Natural Environment 'Designed Areas' subsections. The additional 7 metre OCS Impact / Vegetation Clearance Zone identified as part of the GO Rail Network Electrification Addendum has been shared with Metrolinx's Vegetation Removal and Compensation Program team and has largely been captioned within the system-wide Arborist report completed as part of the program. Additional evaluation and calculation of vegetation removals, especially those beyond Metrolinx's existing ROW will be confirmed as part of future project phases. As part of GO Expansion, Metrolinx has commenced compensation work prior to removals and is pleased to provide funding opportunities for initiatives such as the recent planting of approximately 4,800 trees and 7,500 shrubs at Rouge National Urban Park by Parks Canada and the TRCA. https://blog.metrolinx.com/2020/10/30/metrolinx-partners-with-toronto-conservation-authority-and-parks-canada-to-plant-more-than-12000-trees-and-shrubs-at-rouge-national-urban-park/	Status: Pending review of Natural Environment "Designed Areas" subsections and system-wide Arborist Report, once available. Please confirm when these documents will be available for CoT review.	As noted in the response to Comment #14 above, there will be no vegetation removals within RNFP regulated areas as part of the GO Rail Network Electrification Addendum footprint, which is further detailed within the updated Natural Environment Impact Assessment Report. The report is currently being reviewed internally by the Metrolinx project team and will be shared for information in advance of the formal 30-day public review period for the EPR Addendum, scheduled to commence on February 22nd. Arborist reporting completed as part of Metrolinx's Vegetation Removal and Compensation Program is outside the scope of the GO Rail Network Electrification Addendum. CoT's request to be provided with a copy of the report has been shared with the OnCorr PDT overseeing vegetation removals and compensation.
24	Project Scope – Richmond Hill Corridor	**Draft EPR Addendum, Section 3.2** The track improvements and electrification work that will need to be done between Queen St. and the Belleville Underpass needs to be addressed in the Electrification EA Addendum and/or New Tracks and Facilities. Please confirm which scope this will fall under and when we can expect to review information regarding Natural Environment impacts.	Proposed works along the Richmond Hill corridor including electrification of the Richmond Hill Corridor is being assessed as part of the New Track & Facilities TPAP. The Draft EPR for that project was previously circulated to the City for review and comment in April 2020. Responses to City review comments were issued September 1, 2020.	Status: Open, further discussion between Mx and CoT required. It is noted that proposed works along the Richmond Hill corridor, including Electrification, are being assessed as part of the NTF TPAP. CoT will provide comments on these matters under that scope. However, the original comment was also referring to the Belleville track improvements (Don Branch) and electrification work required between Queen Street and the proposed Don Valley Layover. Mx to confirm which TPAP scope this work will be assessed under, as no information has been received to date. Furthermore, Mx to advise when CoT will receive this information.	As noted in our initial response, track improvements on the Don Branch and the proposed electrification work between Queen Street and the proposed Don Valley Layover are included within the scope of the Richmond Hill corridor, and are therefore being assessed as part of the New Track & Facilities TPAP. The New Track & Facilities TPAP issued a Notice of Completion on December 29, 2020. A copy of the EPR and associated technical studies can be viewed at: https://www.metrolinxengage.com/en/content/new-track-facilities-environmental-project-report
25	Land Use	**Draft EPR Addendum, Section 3.3.5.2.1** In addition to the description provided, the EPR should also note that Laburnham Park includes tennis courts and Don Russell Memorial Park includes a warehouse building directly adjacent to the rail corridor.	Acknowledged. Description has been updated.	Status: Pending review of the final EPR Addendum, once available.	Noted.
26	Visual	**Draft EPR Addendum, Section 3.3.8**	It is noted that Draft EPR Addendum, Section 3.3.8 provides a summary of baseline conditions along the Lakeshore West Rail Corridor. An impact	Status: Pending review of the final EPR Addendum, once available.	Noted.

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		What consideration has been given to areas where people congregate in proximity to the rail corridors. PFR would consider these High Impact Areas. Please confirm how this will be addressed by this assessment.	assessment discussion for the Lakeshore West Rail Corridor is provided in Section 4.3.8. High Impact Areas are defined as areas where views are considerably compromised and should be minimized/mitigated to the extent possible, such as: • Residential areas where homes are within 8 metres from the proposed infrastructure (8 metres was selected as the distance where the rear of homes were so close to the rail corridor that privacy could be compromised due to the removal of vegetation for OCS infrastructure). • Scenic, cultural or historic features/environments directly adjacent to the proposed infrastructure. • Environmental protected and natural areas directly adjacent to the proposed infrastructure. Based on the above, sufficient consideration of potential for people to congregate has been provided. Further information regarding potential visual impact categorization methodology/definitions will be provided within the Final EPR Addendum for additional clarity.		
27	Vegetation Removal	**Draft EPR Addendum, Section 4.2** Please provide identification of impacts related to OCS/Vegetation Clearing as part of Section 4.2.	Acknowledged. Section 4.2 will be updated as part of the Final EPR Addendum submission to identify/discuss potential impacts associated with USRC HONI Conflicts.	Status: Pending review of the final EPR Addendum, once available.	Noted.
28	Consultation	**Draft EPR Addendum, Section 5.1** Please note all completed and planned community consultation related to vegetation removals, retention, and restoration within the EPR. It is the City of Toronto's understanding that Mx has consulted community groups on north side of USRC East corridor (including the USRC East Community Advisory Committee) and therefore this should be noted here. Have any other groups been consulted?	Consultation activities summarized within Section 5 of the EPR Addendum for USRC will be limited to impacts associated with HONI Conflicts. It is acknowledged that engagement efforts remain ongoing with local community groups as part of Metrolinx's Vegetation Removal and Compensation Program to provide updates since TPAP approval in 2017. However, these continued engagement efforts are beyond the scope of this addendum. To clarify, the OnCorr Program reflects a network-wide approach, while the vegetation removal plan discussed at USRC East CACs was more specific given the unique location. Tree removals between Track E0 and the laneway are not being considered, following the determination that E0 was not required as part of Phase 1 work.	Status: Pending review of final EPR Addendum and Arborist Report, once available. We look forward to the CoT's participation in these continued engagement efforts.	Noted.
29	Vegetation Removal	**Natural Environment Impact Assessment Report, Figure 2-1** This image of the Vegetation Clearance Zone appears to be missing some dimensions. Review and correct.	Acknowledged. An updated figure will be provided.	Status: Pending the review of the updated Natural Environment Impact Assessment Report, once available.	Noted.
30	Property Impacts	**Draft EPR Addendum Appendix N, Figures LSW-16 and 17**	Please note the GO Rail Network Electrification Addendum Study Area is identified in red cross-hatching on the north side of the Lakeshore West Corridor, illustrated on Figures LSW-16 and LSW-17.	Status: Closed.	Noted.

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx	CoT Follow Up Comment (December 2020)	How Comment was Considered by Metrolinx (January 12, 2021)
		Although OCS infrastructure is noted to be installed within Mx ROW, the concept plan suggests that there may be impacts to the existing tennis courts located in Laburnham Park and the warehouse building in Don Russell Memorial Park. Confirm the setback from these park assets.	All other OCS Impact / Vegetation Clearance Zone and infrastructure presented were previously approved as part of the 2017 GO Rail Network TPAP. No additional impacts to the existing tennis courts located in Laburnham Park or the warehouse building in Don Russell Memorial Park are being proposed/assessed as part of this addendum.		
31	Utilities	**Draft EPR Addendum, Section 3 and 4** Investigate and identify any existing Toronto Water infrastructure located on Metrolinx lands, within the study areas. If those infrastructures are not already in easements, a new easement agreement will be required between Toronto Water and Metrolinx, identifying the easement boundaries to the satisfaction of Toronto Water (asset owner) and must be accessible from public ROWs.	Acknowledged. Metrolinx has undertaken a review of additional OCS infrastructure areas to determine utility conflicts beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. Commitments for further review and assessment of utility conflicts during detailed design have been included as part of this EPR Addendum. Metrolinx will continue to involve the City of Toronto during detailed design with regard to any utility conflicts or relocations. It is noted that the New Track & Facilities TPAP prepared and previously circulated a draft Utility Impact Assessment Report to the City of Toronto earlier this year. The report is currently being revised and the final report will be provided to the City of Toronto, once available. Any conflicts and/or easement requirements will be confirmed pending further investigations during future project phases. It is noted commitments made as part of the 2017 GO Rail Network Electrification EPR will continue to be upheld.	Status: Pending the review of the final Electrification EPR Addendum and the NTF Utility Impact Assessment Report, once available. The CoT (TPUR) accepts that utility conflicts will be further assessed and detailed. Utility conflict matrix is required to be provided to the CoT for review, as the project progresses. However, establishment of site constrains, including property limits and easement boundaries, crossing the site are the paramount in order to design and review this site properly. Please note that if there are any conflicts identified which will require relocation of any Toronto Water plant, the CoT expects the detailed design stage to include submissions for comment at 10%, 30%, 60%, and 100% final design. Any related easement requirements should be identified early-on in future project phases.	Noted. The New Track & Facilities TPAP issued a Notice of Completion on December 29, 2020. A copy of the EPR and associated technical studies can be viewed at: https://www.metrolinxengage.com/en/content/new-track-facilities-environmental-project-report
32	Utilities	Utilities	**Draft EPR Addendum, Section 3** Identify City of Toronto sewers and watermains that may be impacted by the proposed Metrolinx undertakings. To obtain as-builts drawings for Toronto Water infrastructure please refer to the link below: https://www.toronto.ca/city-government/data-research-maps/utility-maps-engineering-drawings/.	Status: Pending the review of the final Electrification EPR Addendum and the NTF Utility Impact Assessment Report, once available. Please provide the updated report, once available. Establishment of site constrains, including property limits and easement boundaries, crossing the site are the paramount in order to design and review this site properly. Please note that if there are any conflicts identified which will require relocation of any Toronto Water plant, the CoT expects the detailed design stage to include submissions for comment at 10%, 30%, 60%, and 100% final design. Any related easement requirements should be identified early-on in future project phases.	Noted. The New Track & Facilities TPAP issued a Notice of Completion on December 29, 2020. A copy of the EPR and associated technical studies can be viewed at: https://www.metrolinxengage.com/en/content/new-track-facilities-environmental-project-report
33	Utilities	Utilities	**Draft EPR Addendum, Section 6.16.2**	Status: Deferred, CoT to review at future project	Noted.

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx	CoT Follow Up Comment (December 2020)	How Comment was Considered by Metrolinx (January 12, 2021)
			The 6th bullet point references grounding and shorting hazards to be addressed in the EMC Control Plan. Please confirm that proposed electrification will include sufficient shielding of the current to ensure no adverse impacts to the City's transmission and distribution watermain systems. Confirm all locations of grounding and bonding with respect to the watermain system, parallel to tracks, and crossing tracks.	phases.	
34	General / Project Scope	General / Project Scope	**Draft EPR Addendum** Metrolinx should provide clarification on the scope of the TPAP and account for all the anticipated impacts that these proposed utility bridges at Sherbourne, Parliament & Cherry will have on City of Toronto assets (such as roads, sidewalks, and cycling facilities) and the public realm.	Status: Open The original comment was in reference to the utility bridges and has not been answered.	As noted in our original response, the Final EPR Addendum is being updated to reflect the additional proposed works within the USRC driven by the identified HONI conflicts, including associated impacts with utility bridges at Sherbourne, Parliament and Cherry Street.
35	General	General	**Draft EPR Addendum** The mitigation measures to address the temporary (during-construction) and permanent (post-construction) impacts of the bridges have to be clearly stated in the report. This includes the elements the City has been negotiating with Metrolinx in the review process, including but not limited to lighting, cladding, maintenance responsibilities, streetscape, and protecting for future expansion needs.	Status: Open The original comment was in reference to the utility bridges and has not been answered. Mx should consider the mitigations required due to these HONI structure.	See follow up response to Comment #34 above.
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36	General	Please note the CoT's comments on the USRC HONI Conflict Areas Significant EPR Addendum Memo, provided under separate cover, are to be considered in conjunction with the comments provided herein and addressed within the final Electrification EPR Addendum.			Acknowledged.

TABLE 5-24: CITY OF BARRIE DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Commitments / Future Work	Please ensure that all electrification infrastructure does not interfere with the continued operation of the City's short line rail operation that presently operates on the Meaford, Newmarket and Beeton Subdivisions (the short line rail operation travels on the Newmarket Subdivision through the Allandale Station as a connection between the Meaford and Beeton Subdivisions; however, the City has running rights on the Newmarket Subdivision to Bradford and requests that electrification infrastructure not hinder the ability to utilize this section of the Newmarket Subdivision).	Acknowledged. Previous commitments made as part of the 2017 GO Rail Network Electrification TPAP will continue to be upheld and carried forward as part of the GO Rail Network Electrification Addendum, including compliance with Transport Canada clearance requirements. Continued consultation with the City of Barrie / Barrie-Collingwood Railway will be carried out during detailed design with respect to the final design.
2	Vegetation Removal	Please provide advance notice to the City regarding vegetation removal. Please provide notice of vegetation removal to directly impacted residents/property owners and ward councillors. Please provide contact information for resident inquires that are received by the City.	Acknowledged. Advance notification for removals beyond Metrolinx's ROW will be provided. Appropriate Metrolinx contact information will be shared in advance.
3	Vegetation Removal	It is understood that removal of the streetscape trees on Lakeshore Drive fronting the layover facility may be required. The City kindly requests that if tree removal is required, that Metrolinx examines options for a replacement species that may be compatible with the electrification infrastructure. It is understood that this may not be possible due to limited clearance.	We acknowledge that a similar comment was also received by the City of Barrie as part of the 2017 TPAP. Previous commitments made as part of the 2017 GO Rail Network Electrification TPAP will continue to be upheld and carried forward as part of the GO Rail Network Electrification Addendum. If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2020). Recommendations for compatible tree/shrub species adjacent to an electrified rail corridor are included as Appendix L. A copy of this document can be viewed here: https://www.metrolinxengage.com/sites/default/files/mx_vegguide-final_draft_s001-gen-7761-005_reduced_size.pdf
4	Traffic Impacts	Please plan to undertake any necessary traffic signal upgrades on (or interconnected) to at-grade crossings to ensure compatibility with the electrification system.	Metrolinx is not proposing any crossing improvements as part of the GO Rail Network Electrification TPAP Addendum scope. As such, Traffic Impact Assessments are only being completed for the proposed layover/storage yard sites as part of the New Track and Facilities TPAP.

TABLE 5-25: TOWN OF AURORA DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Cultural Heritage	**Cultural Heritage Technical Memorandum, Attachment #1** The addresses for BR-05 to BR-09 in the summary table should be corrected. The properties are all located in Newmarket, not Aurora.	Acknowledged, these addresses will be reviewed and revised in the final submission.
2	Cultural Heritage	**Cultural Heritage Technical Memorandum, Figure BR-3** The heritage status of BR-03 (136 Wellington Street East) and BR-02 (124 Wellington Street) needs to be updated as they were recently designated under Part IV of the *Ontario Heritage Act*. Please indicate whether there will be any anticipated (direct or indirect) impact to the heritage attributes to these properties.	Acknowledged. The Cultural Heritage Technical Memorandum contained in **Appendix C** will be reviewed and updated, where required to reflect this new information. No direct or indirect impacts to BR-03 and BR-02 have been identified as part of the GO Rail Network Electrification EPR Addendum scope of work. It is noted the Electrification Project Team is coordinating internally with the other Metrolinx Project Teams completing work in proximity to these locations, and will ensure that they are made aware of changes to heritage status.
3	Cultural Heritage	**Cultural Heritage Technical Memorandum, Attachment #1** Please indicate whether there will be any anticipated (direct or indirect) impact to BR-01 (Aurora Go Station) due to the consutrciton acitivities associated with the installation of track infrastrcture. If yes, what kind of migitation/monitoring committments will be implemented?	Impacts related to new/upgraded track infrastructure is being assessed as part of the New Track & Facilities TPAP. No additional direct or indirect impacts to BR-01 (Aurora GO Station) as a result of electrification infrastructure are anticipated beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. A Heritage Impact Assessment (HIA) was previously completed in 2017 as part of the GO Rail Network Electrification TPAP to address potential impacts to the Aurora GO Station as a result of OCS infrastructure. A copy of the HIA report can be viewed at the link below: http://www.metrolinx.com/en/electrification/appendix/Appendix%20M%20-%20Aurora%20GO%20Station%20HIA.pdf As part of a separate Metrolinx undertaking, work is anticipated to begin on the rehabilitation of the Aurora GO Station in 2021. Please see the link below for further details: https://blog.metrolinx.com/2020/10/28/as-aurora-go-station-prepares-for-a-facelift-images-combine-then-and-now-look-at-importance-of-rail-connection-for-the-community/
4	Land Use & Socio-Economic	**Land Use & Socio-Economic Impact Assessment, Section 3.4.6** It should be noted that the Aurora Go Station is located within the Special Design Area where development approval is conditional upon completion of a Comprehensive Plan by the developers to address area wide elements. Metrolinx may be consulted in the future for comments on the design of the Comprehensive Plan to ensure there will be no conflcit with the infrastructure expansion.	Acknowledged. Please note that due to recent scope change, the proposed track design has been revised within the Aurora GO Station segments. The proposed tracks and associated electrification infrastructure at Aurora GO Station are to remain within Metrolinx's ROW. The Land Use and Socio-Economic Impact Assessment Report contained in **Appendix E** has be revised to reflect this change in scope.
5	Land Use & Socio-Economic	**Land Use & Socio-Economic Impact Assessment, Table 4-6** The sensitive facilities within the vicinity of Barrie Rail Corridor Row should include École élémentaire catholique Saint-Jean at 90 Walton Drive as it is located is within 120m from the OSC impact zone	Acknowledged. This school will be added to sensitive facilities within the vicinity of Segment BR-6 and Table 4-6, as seen in the Land Use and Socio-Economic Impact Assessment Report contained in **Appendix E**. Please note that only facilities within 100 metres of the proposed infrastructure have been included in the report.

TABLE 5-26: REGION OF YORK DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Land Use	**Draft EPR Addendum, Section 3.5.5.4 OCS: Section BR-6, Section 3.5.5.6.2, Section 3.5.5.7 OCS: Section BR-7** It is noted in numerous sections future and existing trails that cross the railway tracks. For all locations where cycling and pedestrain facilities cross the railway tracks, it is recommended that the crossing be at a minimum be as close as possible to a 90 degree angle crossing to prevent cyclists from falling from their bicycle. Recommendation for appropriate design and signage considerations are available in our York Region Planning and Design Guidelines, available online in section 5.5 Railway Crossings.	Metrolinx is not proposing any crossings improvements as part of the GO Rail Network Electrification TPAP Addendum scope. Final placement of OCS pole foundations will be determined during detailed design and will provide consideration for existing/approved rail crossings.
2	Utilities	There are several easements that the Region owns through Metrolinx's rail corridor. The water and/or wastewater crossing are within a steel liner. At this early stage of design, the Region requests that no OCS foundations and/or any other foundations are placed within 1m or one outside pipe diameter, which ever one is greater, away from the outside edge of the steel liner. Please circulate a set of design drawings as they become available for review.	Acknowledged. Metrolinx is currently in the process of completing a Due Diligence Exercise which will review additional OCS infrastructure areas to determine utility conflicts. Additional details regarding any identified conflicts and final OCS pole foundation locations will be shared once they become available during detailed design.
3	General	The Region has an interest in all Metrolinx proposed infrastructures that will be crossing the Regional infrastructures such as bridges and Regional roads. Therefore, the Region is requesting that Metrolinx consults with the Region on any potential impacts on the Region infrastructures, maintenance and safety.	Acknowledged. Metrolinx will continue to consult with the Region on matters that may impact Regional infrastructure and operations.

TABLE 5-27: CITY OF MARKHAM DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	General	While the City does not have any specific comments to the Draft Environmental Project Report (EPR) Addendum for the GO Rail Network Electrification Project, the report however does reference a number of techincal reports from the OnCorr - New Track and Facilites Transit Project Assessment draft EPR, in which the City has provided comments to. A copy of these comments are attached. The City has not received a response to these comments from Metrolinx. The City looks forward to reviewing comments as part of the consultation process for the New Track and Facilites Transit Project as well as the GO Rail Network Electrification Project Addendum.	Thank you for completing your review of the draft Electrification EPR Addendum. We can advise that the New Track & Facilities Project Team received the comments and a response was issued on September 23, 2020. The comments will also be considered when finalizing the Electrification EPR Addendum. It is also acknowledged that a Council Resolution regarding the Unionville Storage Yard proposed as part of the New Track & Facilities TPAP was sent to Metrolinx on October 8, 2020. Metrolinx is continuing to discuss this internally to provide a response in hopes of reaching a mutually agreeable solution.

TABLE 5-28: REGION OF DURHAM DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	General	Durham staff feel the impacts of the addition Overhead Contact System to cover the additional track between the Whitby Rail Maintenance Facility and the existing Oshawa GO Station, including across the Thickson Road bridge widening will have minimal impacts.	Acknowledged. Thank you for the feedback. It is noted that the City of Oshawa submitted a council resolution to Metrolinx on September 29, 2020 to endorse the comments provided by their Development Services department on the Draft EPR Addendum. Metrolinx is currently preparing responses to these comments and will issue to the City of Oshawa, once available.
2	Scope – Lakeshore East Corridor	We would like to see an overall plan to demonstrate how the work proposed in this TPAP addendum coordinates with the Bowmanville extension work.	The scope of the GO Rail Network Electrification Project and associated Addendum is limited to Metrolinx owned corridors/track. The portion of track options identified for the Bowmanville Expansion are owned by Canadian Pacific Railway (CP Rail); as such, further approval/coordination will be required with CP Rail to provide electrified service on these tracks. While the 2017 GO Rail Network Electrification Project EPR and current Addendum did not assess electrification east of the existing Oshawa GO Station, it does not preclude the provision of electrified service in the future. It is noted that the City of Oshawa submitted a council resolution to Metrolinx on September 29, 2020 to endorse the comments provided by their Development Services department on the Draft EPR Addendum. Metrolinx is currently preparing responses to these comments and will issue to the City of Oshawa, once available.

TABLE 5-29: CITY OF OSHAWA DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Project Design / Construction	The potential impacts to the existing Oshawa GO Station should be clearly identified. In this regard, Metrolinx is requested to confirm whether or not the pedestrian walkway to the west parking lot and the bus loop will be affected during construction, and if so, whether these facilities will be shifted north on a temporary or permanent basis. Likewise, potential effects on the number of parking spaces being provided during construction are requested.	Metrolinx is in the process of reviewing the impacts to the bus loop design and GO Station layout. Efforts will be made to mitigate impacts to parking spaces and the pedestrian path. Impacts to the Oshawa GO Station platform and parking spaces will be addressed under the New Track and Facilities TPAP, detailed further at the link below: https://www.metrolinxengage.com/en/newtrackfacilities Metrolinx will consult with the City of Oshawa, Durham Region, and Durham Transit once more information is available.
2	Stormwater Management	Metrolinx is requested to confirm whether the existing storm sewer outfall located near the area of the proposed station platform, and the associated storm sewer easement, will be affected. Likewise, confirmation is requested as to whether there will be any potential effects due to construction on the outfall structure or the drainage ditch leading east, including due to overland flow. Staff note that the storm water management infrastructure at the Oshawa GO Station and along the adjacent segment of Thornton Road South are owned by the Region of Durham.	This comment is noted; however, Metrolinx is unable to address it at this time based on the conceptual nature of the current design. The location of the OCS infrastructure required for electrification is limited to the rail Right-of-Way, and minimal impacts are anticipated beyond what is identified as part of the New Track & Facilities TPAP.
3	Stormwater Management	Metrolinx is requested to give the City the opportunity to provide comments during the detailed design phase for the proposed works, including in relation to the storm water management system and any potential effects.	Acknowledged. Metrolinx will provide this information once it becomes available, prior to construction.
4	Project Construction	Information regarding any potential effects on existing service during construction is requested as soon as possible, in order to inform riders so they may be able to adjust their commuting schedules accordingly.	Acknowledged. Metrolinx will provide this information once it becomes available, prior to construction.
5	Project Scope / Timelines	Confirmation that the provision of electrification infrastructure will not adversely affect the timing of the planned Bowmanville Rail Service Expansion along the CN/CP line is requested.	Metrolinx is working with the Bowmanville Expansion team internally to ensure the projects are coordinated. Metrolinx will share details with the City once they become available. Construction of electrification infrastructure along the Lakeshore East (LSE) corridor will not adversely impact the Bowmanville Service Expansion. While the 2017 GO Rail Network Electrification Project EPR and current Addendum does not assess electrification east of the existing Oshawa GO Station, it does not preclude the provision of electrified service in the future.
6	Project Design	City staff request that a concept plan be provided to demonstrate how the proposed electrification infrastructure in the Draft E.P.R. Addendum would integrate with the existing and proposed tracks and platforms at the Oshawa GO Station required for the Bowmanville Rail Service Expansion.	Metrolinx is working with the New Track & Facilities and Bowmanville Expansion teams internally to ensure the projects are coordinated. Metrolinx will share details with the City once they become available. Additional design information and standards related to electrification infrastructure, including OCS, support structures and typical GO station modifications were previously documented in the 2017 GO Rail Network Electrification EPR, Volume 1 which can be viewed here: http://www.metrolinx.com/en/electrification/docs/GO%20Rail%20Network%20Electrification%20Environmental%20Project%20Report_Volume%201.pdf Future service for the Bowmanville Expansion is being evaluated under a separate EA addendum. Please contact the project team for details on the Bowmanville Rail Service Expansion: Leila Sotoudeh: Project Manager, EPA Simon Strauss: Manager (A), EPA
7	Consultation	Staff will request that one or more of the Public Meeting Round 3 events be held in Oshawa.	Due to the ongoing global health pandemic caused by COVID-19, Metrolinx has opted for virtual public meetings. The 3rd round of Public Open Houses will be hosted virtually late November / early December. This will give agencies, stakeholders and the public equal opportunity to review project materials and provide comments. The City of Oshawa will receive email notification in advance of the public open houses with further details.

TABLE 5-30: TOWN OF EAST GWILLIMBURY DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	General	In general the Town does not have any technical comments on the Rail Network Electrification TRAP.	Metrolinx appreciates the Town of East Gwillimbury's review of the Draft Environmental Project Report Addendum.
2	Expansion Program Scope / Future Service	However, Staff is requesting Metrolinx to consider to extend the long-term goal of the GO Expansion Program to include 15-minute, two-way, all-day service from Aurora GO Station to East Gwillimbury GO Station. The proposed extension is warranted for the following reasons: • Is anticipated that the amendments to the Provincial Growth Plan will see the Town of East Gwillimbury to experience a higher population growth of over 150,000 residents and 75,000 jobs by 2051. • The existing GO Expansion Program will extend the tracks from Aurora Go Station to Newmarket. The Town of Newmarket currently does not have an approved secondary plan surrounding a proposed Mulock GO Station area, whereas the Town of East Gwillimbury has an approved secondary plan surrounding the existing East Gwillimbury GO station. • The East Gwillimbury GO Station is a recognized Major Transit Station Area (MTSA) for the Region of York and is within the approved Green Lane Secondary Plan, which encourages high density and transit supportive developments. • The Green Lane Secondary Plan will accommodate approximately 28,750 residents and 4,340 jobs at full build-out, leading to an overall density of over 70 persons and jobs per hectare. • The Green Lane corridor is recognized for future bus rapid transit and will be utilized as a key regional mobility connection as part of the high-density planning for the area. • The Town recently adopted the Highway 404 Employment Corridor Secondary Plan, which anticipates the creation of over 5,000 new jobs across a variety of sectors around the intersection of Green Lane and Highway 404. • Expanding rapid transit to East Gwillimbury GO Station completes the service for York Region and the Greater Toronto Area (GTA) and is also a logical transition point between the GTA and Simcoe County. In addition, infrastructure is required to support the extension to East Gwillimbury GO Station: • Track twinning from Aurora/Newmarket to some transitional point north of the East Gwillimbury GO Station • East Gwillimbury GO Station improvements including a new platform, associated civil and structural works and site improvements to make use of the second track and rapid transit service • Advance grade separations at the railway crossings, potentially at St John's Sideroad, Mulock Drive, Davis Drive and Green Lane • Newmarket GO Station improvements and/or advancing the proposed Mulock GO Station	Metrolinx acknowledges the Town of East Gwillimbury's Secondary Plan and the role that GO Expansion has in meeting the Provincial Growth Plan by building a rapid transit network across the Region. The GO Expansion program was amended and the service plan will now include 15-minute, two-way, all-day service beyond Aurora GO to East Gwillimbury GO Station. The proposed extension requires twinning the tracks and other ancillary infrastructure improvements. Metrolinx would be pleased to discuss this change with Town staff. The request to expedite the road-rail grade separation at Green Lane will be a separate discussion between Metrolinx and York Region. For inquiries concerning other railway at-grade crossings please contact Metrolinx and we will forward your request to the appropriate teams. For potential future GO stations, including the proposed location at Mulock Drive in Newmarket: • In 2016, Metrolinx completed an Initial Business Case (IBC) and further completed a Preliminary Design Business Case (PDBC) in 2018 which examined the benefits of a potential Mulock GO Station on the Barrie GO corridor within the Town of Newmarket. • In April 2019, Metrolinx adopted the Transit Oriented Communities Program to implement transit infrastructure that leverages the value of Metrolinx's transit network, service and real estate portfolio. This program involves the partnership between Metrolinx and a third party to deliver new or improved transit infrastructure wherein third parties will fund the design and construction of infrastructure and Metrolinx will operate it. • Proposed GO stations will be subject to further approvals and agreements and delivered by a third party partner.

TABLE 5-31: TOWN OF NEWMARKET DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Cultural Heritage	All the addresses on Cotter Street are noted as being in the Town of Aurora. For public contact, ensure that the mailing addresses are for the Town of Newmarket.	The addresses will be corrected in the final submission.
2	Project Scope	With the twinning of the tracks through Newmarket, there is no noted economic or other impact that the change will have with respects to the safety requirements in the Railway Safety Act and its regulations on the road crossings.	Acknowledged, however Impacts associated with new/upgraded track infrastructure are being assessed as part of the New Track & Facilities (NTF) TPAP. This EPR Addendum assesses additional electrification infrastructure (i.e. OCS) beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR.
3	Project Scope	The rail bridge over the East Holland River is a single track bridge (just north of Timothy Street). There appears to be no noted impacts or mitigation mentioned for increasing this bridge.	Acknowledged. Impacts associated with new/upgraded track infrastructure are being assessed as part of the New Track & Facilities TPAP; measures to address impacts to this rail bridge will be discussed within the NTF TPAP EPR. The Project Team acknowledges that, under a separate project, design and due diligence work is proceeding for the replacement of the bridge to accommodate the second track as identified in the 2017 Barrie Rail Corridor Expansion TPAP. Metrolinx is coordinating the various projects at this location.
4	Project Scope	Around 2004/2005, the Town constructed a pedestrian/rail crossing with full signals south of the East Gwillimbury GO station. It was desiged as AODA compliant and for a single track crossings. There does not seem to be any noted impacts, changes or mitigation measures for this important pedestrian crossing.	Acknowledged. Impacts associated with new/upgraded track infrastructure are being assessed as part of the New Track & Facilities TPAP. Limits of the GO Rail Network Electrification Addendum study area within the Town of Newmarket terminate further south of the referenced pedestrian/rail crossing. As such, no further impacts as a result of electrification infrastructure are anticipated.

TABLE 5-32: TOWNSHIP OF KING DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Project Scope – Train Whistles	Based on our review of the documents, it does not appear our original comment from January 2020 has been addressed. Please find below our January 2020 comment for your reference. 'At the April 3rd, 2017 Township Committee of the Whole Meeting, Mr. Spensieri, Director of Corridor Infrastructure, and Ms. Moroz, Director of Communications and Community Relations, were invited to appear on behalf of Metrolinx to provide updates relating to the rail improvement works. Following the presentation, questions relating to train whistle cessation were fielded by Mr. Spensieri and Ms. Moroz. It was the understanding of Mayor and Council that Metrolinx committed to the necessary improvements to enable train whistle cessation for at-grade crossings throughout King Township. Further, in May 2018, the Township passed a resolution that was circulated to various agencies including Metrolinx to emphasize the importance of train whistle cessation to its residents. This resolution acknowledged the safety requirements governed by Transport Canada, but also identified the disruptive nature of train whistles to residents. Metrolinx was again invited to provide Mayor and Council with updates at the July 8th, 2019 Township Committee of the Whole Meeting. Mr. Irving, Senior Manager of Community Stakeholder Relations, and Ms. Osojnicki, Manager of Environmental Programs & Assessment, provided a slide presentation on the updates for the GO expansion projects within the Township. Council and Mayor once again re-iterated that Metrolinx had made commitments in 2017 for whistle cessation within the Township and further advised that simply meeting the minimum Transport Canada guidelines is unacceptable. Mayor Pellegrini further met with Mr. Irving at a meeting on August 14, 2019 to discuss level crossings and whistle cessation. The Township was advised that the necessary works to enable whistle cessation within the Township had not been incorporated into the design. The Township of King expects Metrolinx to fulfill the commitments made in 2017 to complete all the necessary works to enable train whistle cessation for all the at-grade crossings within the Township.'	Thank you for your comments. Please note that the purpose of the GO Rail Network Electrification EPR Addendum is to assesses additional electrification infrastructure beyond what was previously assessed as part of the 2017 GO Rail Network Electrification EPR. At present, no additional electrification infrastructure is proposed within the Township of King. The final EPR Addendum will provide additional details related to updated Noise and Vibration Assessments, including recommended mitigations measures. Whistle cessation is a municipally-led process. The Metrolinx Whistling Exemption Process Guidelines provide an overview of the regulatory framework and process that municipalities must undertake to implement whistle exemptions at Metrolinx-owned railway crossings. The Whistle Exemption Process is consistent with the requirements of section 23.1 of the Railway Safety Act, Section 104 of the Grade Crossings Regulations, and Appendix D of the Grade Crossing Standards. Metrolinx acknowledges the meetings held in 2019 with the Township of King to discuss at-grade crossings and whistle cessation. Metrolinx is willing to work with the Township of King on a municipally-led study of what infrastructure would be needed to support whistle cessation. Safety is our number one priority, and Metrolinx is examining all existing at-grade crossings from a safety perspective as a result of the implementation of GO Expansion. Metrolinx looks forward to continuing the discussions with the Township of King to fulfill commitments made in the 2017 Electrification TPAP as the project moves into detailed design. Sounding whistles at level crossings is something we do as a matter of safety. Out of an abundance of caution, Metrolinx will sound whistles as our trains pass over level crossings within the Township of King that do not already have active signalization measures (i.e., bells, lights, and gate arms). At crossings where no such measures exist, or where the measures are not full active signalization, Metrolinx will continue using the whistle. This is consistent with the presentation delivered to Council in 2017, and which can be found online here: https://www.metrolinxengage.com/sites/default/files/king_city_council_april_3_final.pdf.

TABLE 5-33: TOWN OF WHITCHURCH-STOUFFVILLE DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Scope	The Town of Whitchurch-Stouffville Council passed the following resolution at its meeting on November 7, 2017 with regard to the Metrolinx GO Rail Network Electrification Project Moved by Councillor Lovatt Seconded by Councillor Hargrave 1) That Council request Metrolinx to reconsider implementing parking charges at both Stouffville and Lincolnville GO stations; and 2) That Council direct staff to submit the respective parts of this report as the Town's comments on the draft 2041 Regional Transportation Plan and the Environmental Assessment Study for the Electrification of the GO Rail Network; and 3) That Council direct staff to continue working with Metrolinx on all its projects that affect the Town of Whitchurch-Stouffville and report back in due course. Carried	Acknowledged. Metrolinx previously issued a response to the Town of Whitchurch-Stouffville on November 16, 2017. Please note that with respect to issues which are outside the scope of the 2017 GO Rail Network Electrification TPAP and associated TPAP Addendum currently being undertaken (e.g., station improvements, parking, etc.), Metrolinx will continue to consult with the Town on these matters as appropriate. Follow the link below for the Lincolnville Layover and GO Station Improvement Environmental Project Report (EPR, April 2018) and Environmental Project Addendum (February 2019). After completion of the EPR, it was determined that a new GO station was required to accommodate projected passenger growth and allow for full build-out of the layover improvements. Therefore, the relocated GO station was assessed in the Addendum. Construction initiation is imminent, and completion is projected for October 2022. http://www.metrolinx.com/en/greaterregion/projects/lincolnville-layover.aspx
2	Service Levels - Timelines	In a meeting with Mr. Phil Verster, President & CEO of Metrolinx, Mr. Michael Norton, VP of Transit Oriented Development, and Mr. Spencer Kelly, VP Community Relations and Communications for Capital Program at Town Hall on January 8, 2020, invited by His Worship Mayor Iain Lovatt, and in a subsequent announcement to the Town's developers' group by Mr. Verster immediately after the meeting, we learned that all-day GO rail service to the Stouffville and Lincolnville GO stations is already part of the Metrolinx plan. As such, the Town has been making a very significant effort to require new developments to meet a much higher density target in the Lincolnville GO Station area to support transit and increase GO train ridership. We respectfully request that the all-day GO rail service to Lincolnville Station can be reflected and clarified with a timeline in the GO Rail Network Electrification Project.	The scope of the GO Rail Network Electrification Addendum includes an updated assessment of noise, vibration, and air quality associated with increased service levels across six Metrolinx-owned rail corridors, including the Stouffville Corridor. As the assessments are currently in progress they were not included as part of the Draft EPR Addendum circulation. The final EPR Addendum will include additional details regarding updated noise, vibration and air quality assessment studies based on anticipated future train service levels. It is important to note that additional infrastructure (i.e. new/upgraded tracks, layover facilities and grade separations) are currently being assessed by Metrolinx as part of separate undertakings along the Stouffville Corridor in order to achieve future service levels. Detailed design will begin in 2021 and construction for the OnCorr Program is expected to commence in 2022. The proposed schedule and phasing plan for completion will be available at that time. Please see Response #1 above for further information on the improvements to the Lincolnville GO Station.

5.8.1.4 Conservation Authority Review Agency Comments Received on Draft EPR Addendum

Table 5-34 to **Table 5-36** below contain comments (verbatim) submitted by each conservation authority as well as how the comment was considered and responded to by Metrolinx.

TABLE 5-34: LAKE SIMCOE REGION CONSERVATION AUTHORITY DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Natural Environment	**Draft Natural Environment Impact Assessment Report, Table 2-1** Treed Agricultural (TAG) communities are described as including coniferous, deciduous and mixed plantations as well as fence rows. The extent of tree removal from these communities should be considered fair or extensive as the canopy cover would generally be >20%. It should be recognized that it is likely that these communities are providing habitat for wildlife. As an example, Figure BR-12 shows a community identified as TAG, but it is shown as wooded area in Figure BR-70. It appears to be woodland from orthoimagery. It should be recognized that impacts from tree removal in areas like this could potentially have a medium to high impact from an ecological perspective.	It is acknowledged that TAG communities may provide habitat for wildlife. A TAG classification was given to this community based on air photo analysis which shows the community located between the rail corridor and residential area. Vegetation removals within this TAG are mainly located within the existing Metrolinx ROW. Given the presence of an existing active rail corridor, potential effects to adjacent natural features and wildlife habitat occurring beyond the rail ROW are anticipated to be negligible.
2	Natural Environment	**Draft Natural Environment Impact Assessment Report, Table 2-1** The potential ecological impact to Mixed Meadow (MEM) communities was determined to be low; however, it should be recognized that it is likely that these communities are providing habitat for wildlife. Specifically, several Species at Risk may use the habitat present in these communities.	The MEM communities identified within the project area were generally heavily impacted and therefore identified to provide limited habitat value. As noted above, given the presence of an existing active rail corridor, potential effects to adjacent natural features and wildlife habitat occurring beyond the rail ROW are anticipated to be negligible.
3	Natural Environment	**Draft Natural Environment Impact Assessment Report, Section 2.2.1 and Section 3.8.1.1.1** It is understood that site-specific edge management mitigation measures will be identified during detailed design; however, additional direction/guidance should be provided in the draft NEIA to identify appropriate edge management strategies ahead of detailed design (e.g. selective thinning, interplanting, planting edge tolerant native trees/shrubs, etc.).	Acknowledged. Additional details/guidance regarding edge management will be reviewed and provided, where appropriate. The potential removal of vegetation (where required) will be addressed/compensated for in accordance with Metrolinx's Vegetation Guideline (2020).
4	Natural Environment	**Draft Natural Environment Impact Assessment Report, Section 3.8.1.1.1** The management of invasive species along the ROW should not be restricted to just emerald ash borer, Asian long-horned beetle and common reed, as is suggested by the text in the draft NEIA. It should also include, at a minimum, the invasive plant species Japanese knotweed and dog-strangling vine as these are also listed as restricted species under the *Invasive Species Act*. We note that the management of invasive species will be as prescribed by the Integrated Vegetation Management within the Metrolinx Vegetation Guideline (2020), but Appendix I and J in this document do not accurately reflect management priorities for invasive plant species within the LSRCA jurisdiction. It is recommended that appropriate management for invasive species be determined on a species- and site-specific basis.	The management of emerald ash borer and Asian long-horned beetle species in this section was specifically related to potential removal and disposal of anticipated affected tree species during construction. While the spread of common reed is much more prevalent due to the seed volumes, it is recognized that Japanese Knotweed and dog-strangling vine are also invasive species of concern. Clarification will be provided within the report that the management of invasive species is not limited to those specifically referenced. In addition, reference to Japanese Knotweed and dog-strangling vine will be added to the report as requested. The Integrated Vegetation Management (IVM) component of Metrolinx's Vegetation Guideline addresses the overall approach to invasive species management throughout the entire GO Rail Network. It is noted that the Vegetation Guideline, Section 5.3.2.2 does acknowledge that due to the broad range of invasive species, few generalizations can be provided for management guidelines. Instead, appropriate management for invasive species will be species- and site-specific. It is noted previous commitments made as part of the 2017 GO Rail Network Electrification TPAP will continue to be upheld and carried forward as part of the GO Rail Network Electrification Addendum.
5	Natural Environment	**Draft Natural Environment Impact Assessment Report, Section 3.8.1.1.3** As some Species at Risk may have unrestricted access to impacted areas, and the species listed under the *Endangered Species Act* can change over time, it's recommended that a Species at Risk screening be completed on a site by site basis closer to the time of anticipated disturbance. This would reduce the likelihood of any unintended or accidental contravention of the *Endangered Species Act*.	Acknowledged. All requirements of the *Endangered Species Act* (ESA) and *Species at Risk Act* (SARA) will be met. Species-specific mitigation measures will be implemented based on any recommended surveys undertaken prior to construction, and consultation with the Ministry of Environment, Conservation, and Parks (MECP) / Ministry of Natural Resources and Forestry (MNRF). Table 5-2 (Summary of Potential Effects, Mitigation and Monitoring Commitments – Natural Environment) of the Natural Environment Impact Assessment Report provides additional mitigation/monitoring commitments with respect to SAR/wildlife screening during construction. It is noted previous commitments made as part of the 2017 GO Rail Network Electrification TPAP will continue to be upheld and carried forward as part of the GO Rail Network Electrification Addendum.

TABLE 5-35: CENTRAL LAKE ONTARIO CONSERVATION AUTHORITY DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	General	Hi project team, as the footprint and impacts of new infrastructure required for electrification is, to my understanding, largely the same as presented in the New Track and Facilities Project TPAP, I've attached our previously submitted comments for that study.	Thank you for completing your review of the draft Electrification EPR Addendum. We can advise that the New Track & Facilities Project Team received the comments and a response was issued on September 22, 2020. The comments will also be considered when finalizing the Electrification EPR Addendum. It is noted that no direct footprint impacts to the two main tributaries of Corbett Creek are proposed in order to accommodate electrification infrastructure as referenced in Draft EPR Section 4.7.1.8.1. In addition, vegetation removals within CLOCA Regulated Areas were identified in Draft EPR Section 4.7.1.8.1.4. Previous commitments made as part of the 2017 GO Rail Network Electrification TPAP will continue to be upheld and carried forward as part of the GO Rail Network Electrification Addendum.

TABLE 5-36: CONSERVATION HALTON DRAFT EPR ADDENDUM COMMENTS AND RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	General	Thank you again for sharing the draft Electrification EPR Addendum with Conservation Halton (CH). Based on our review, CH has no specific comments on the report at this time. The areas of key interest to CH are the Walkers Line and Beach Layover sites in Burlington. CH may provide detailed comments once additional information becomes available and assessments are complete, in particular for the Walkers Line site, which we understand was still under review at the time of preparing the draft EPR Addendum. We recommend referencing prior correspondence from CH regarding the related New Track and Facilities TPAP, which would also generally apply to the associated electrification works.	Thank you for completing your review of the draft Electrification EPR Addendum. We can advise that the New Track & Facilities Project Team received the comments and a response is being prepared. The comments will also be considered when finalizing the Electrification EPR Addendum. We very much appreciate Conservation Halton's review. We look forward to your continued involvement in this Project.

5.8.1.5 Other Stakeholder Review Agency Comments Received on Draft EPR Addendum

Table 5-37 below contain comments (verbatim) submitted by each conservation authority as well as how the comment was considered and responded to by Metrolinx.

TABLE 5-37: HYDRO ONE DRAFT EPR ADDENDUM COMMENT RESPONSES

Item No.	Issue	Comment/Issue Raised by Review Agency	How Comment was Considered by Metrolinx
1	Project Scope - USRC	**EPR Addendum, Section 2.1, Figure 2-1** I believe the beige colour identifying the 2020 Electrification Addendum Study Area in figure 2-1 is missing over the USRC east section pertaining to the HONI conflict work within the USRC. The note in relevant sections indicates that it will be added to the this Addendum so I recommend revising the figure to include the applicable area.	Noted. A study area map, specific to USRC will be included in Section 2.2.1 to clarify the HONI conflict work that will be addressed as part of this EPR Addendum. An updated version of the Network Key Map (Figure 2-1) has been provided as an attachment to this response.
2	Project Scope - USRC	**Appendix N, Concept Plan for USRC** Similar comment as above. Should a concept plan for the USRC be included in Appendix N which identifies the areas of the USRC that will be included in the scope of this Addendum due to the HONI conflict area?	Correct. Mapping for USRC will be included in Appendix N as part of the Final EPR Addendum submission.

5.9 Notice of EPR Addendum

In accordance with Section 15 of O. Reg.231/08, a Notice of Environmental Project Report (EPR) Addendum was issued on February 22, 2021. The Notice provides the public, Indigenous Nations and organizations, review agencies and other stakeholders with information about the project, next steps, how to access the EPR Addendum (posted online to the Metrolinx Engage website) and how comments may be formally submitted on the EPR Addendum. The Notice of EPR Addendum was published on separate dates in the following newspapers with circulation of the project study area, as summarized in **Table 5-38.**

The Notice of EPR Addendum includes the following information (a copy of the Notice can be found in **Appendix M2**):

- Information as to where and how members of the public may examine the Environmental Project Report Addendum and obtain copies;
- A description of the objection process, which includes:
    - A statement that there are circumstances which the Minister has authority to require further consideration of the transit project, or impose conditions on it, if he or she is of the opinion that:
        - The transit project may have a negative impact on a matter of provincial importance that relates to the natural environment or has cultural heritage value or interest; or
        - The transit project may have a negative impact on a constitutionally protected Aboriginal or treaty right.
- A statement that, before exercising the authority referred to above, the Minister is required to consider any written objections to the transit project that he or she receives within 30 days after the Notice of Environmental Project Report Addendum is first published.

TABLE 5-38: NOTICE OF EPR ADDENDUM NEWSPAPER PUBLICATIONS

Publication	Dates Published
Toronto Star (includes online version)	Monday February 22, 2021 Saturday February 27, 2021
Toronto/Mississauga Le Metropolitan (includes online version)	Thursday February 24, 2021 Thursday March 4, 2021
Toronto L'Express (includes online version)	Friday February 25, 2021 Friday March 5, 2021

The Notice of EPR Addendum was provided to the following stakeholders:

- Director, Environmental Assessment Services, Environmental Assessment Branch, Ministry of the Environment, Conservation and Parks (MECP);
- Director, Central Region MECP;
- The following Indigenous Nations & organizations:
    - Alderville First Nation;
    - Beausoleil First Nation;
    - Chippewas of Rama First Nation;
    - Curve Lake First Nation;
    - Hiawatha First Nation;
    - Huron-Wendat Nation;

  - Kawartha Nishnawbe First Nation;
  - Mississaugas of the Credit First Nation;
  - Mississaugas of Scugog Island First Nation;
  - Six Nations of the Grand River;
  - Williams Treaties First Nations (WTFN); and,
  - Haudenosaunee Confederacy Chiefs Council.
- Every individual who provided a written request for a copy; and,
- All members of the public/review agencies/municipalities/other stakeholders with email/mailing addresses included on the Project Contact List.

5.9.1 30-Day Public Review

Upon issuing the Notice of EPR Addendum, the Final EPR and Supporting Appendices (environmental and technical studies) were made available for 30 days for review by the Public (including property owners), Indigenous Nations and organizations, Review Agencies, and other Stakeholders. Specifically, the EPR Addendum was posted online to the Metrolinx project website as follows: https://www.metrolinxengage.com/en/electrification

During the 30-day review period, if there are concerns pertaining to the potential for a negative impact on a matter of Provincial importance according to *O. Reg. 231/08* that relates to the natural environment or has cultural value or interest, or on a constitutionally protected Aboriginal or treaty right, an objection may be submitted to the Minister of Environment, Parks and Conservation (the Minister) as outlined in the Notice of Completion.

The 30-day review period will commence on February 23, 2021 and will conclude on March 24, 2021.

5.9.2 35-Day Ministers Review

Following the 30-day public review period, the Minister has 35-days within which to issue one of three notices:

- Proceed with the Project in accordance with the EPR Addendum; or
- Proceed with the Project in accordance with the EPR Addendum subject to conditions; or
- Require the proponent to conduct further work and submit a revised EPR Addendum.

The 35-day review period will commence on March 25, 2021 and will conclude on April 28, 2021.

6 Commitments for Future Work

6.1 Implementation of Mitigation Measures

This section is to be read in conjunction with Section 4 of this Environmental Project Report (EPR) Addendum and Volume 5 of the 2017 GO Rail Network Electrification EPR.

To ensure that potential adverse environmental effects associated with the GO Rail Network Electrification project are avoided/minimized/mitigated to the extent possible, the following actions will be adhered to by Metrolinx during the detailed design and construction phases of the project:

- Implement all mitigation measures as documented in Section 4 of this EPR Addendum during the detailed design, construction and operational phases of the project;
- Implement all mitigation measures as documented in Volume 3 of the 2017 GO Rail Network Electrification EPR during the detailed design, construction and operational phases of the project, where not superseded by those detailed within this EPR Addendum;
- Ensure that all mitigation measures outlined in Section 4 of this EPR Addendum and all commitments outlined in Section 6 of this EPR Addendum are captured in the Contract Documents for implementation by Metrolinx, Hydro One, and/or the Contractor as appropriate;
- Ensure that all mitigation measures outlined in Volume 3 and all commitments outlined in Volume 5 of the 2017 GO Rail Network Electrification EPR are captured in the Contract Documents for implementation by Metrolinx, Hydro One, and/or the Contractor as appropriate, where not superseded by those detailed within this EPR Addendum, and;
- Undertake all additional studies/work as outlined in this EPR Addendum and/or the 2017 GO Rail Network Electrification EPR prior to implementation of the undertaking.

6.2 Environmental Management System

Prior to construction and implementation of the Project, an Environmental Management System (EMS) will be established and implemented to ensure that environmental protection/mitigation measures identified through this EPR Addendum are fulfilled and functioning as expected. The overall intent of the EMS will be to integrate environmental management into the daily operations and other quality management systems of the project.

Specifically, an EMS that conforms to ISO 14001:15 – Environmental Management Systems – Requirements with guidance for use (“ISO 14001”) will be established. The EMS will ensure and serve as a mechanism for performance evaluation, including,

(i) the methods for monitoring, measurement, analysis and evaluation;
(ii) the criteria against which environmental performance is measured;
(iii) the timing for performance of monitoring and measuring; and
(iv) the timing for analysis and evaluation of the results from monitoring and measuring.

6.3 Permits and Approvals

In addition to carrying out the EPR Addendum and satisfying the requirements of O. Reg. 231/08 (made under the Environmental Assessment Act), there are also a number of other federal, provincial, municipal, and other approvals/permits required for the GO Rail Network Electrification Project in order to implement it. As a result, the following section summarizes the preliminary list of permits and approvals that are anticipated to be required. Metrolinx and Hydro One (as applicable) will:

- During detailed design, review and confirm all permits and approvals that need to be acquired as part of implementing the undertaking; and
- Obtain all required permits/approvals prior to implementation of the undertaking.

6.3.1 Federal

6.3.1.1 Canadian National Railway

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed. Metrolinx will continue to coordinate and consult with CN, as appropriate during detailed design where there are interfaces with freight territory.

6.3.1.2 Canadian Pacific Railway

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed. Metrolinx will continue to coordinate and consult with CP, as appropriate during detailed design where there are interfaces with freight territory.

6.3.1.3 VIA Rail

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed. Metrolinx will continue to coordinate and consult with VIA Rail, as appropriate during detailed design where there are interfaces with passenger rail territory.

6.3.1.4 Parks Canada – Rouge National Urban Park

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.1.5 Parks Canada – Environmental Impact Analysis Process

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.1.6 Impact Assessment Act

On June 21, 2019, Bill C-69, an Act to Enact the Impact Assessment Act and the Canadian Energy Regulator Act, to Amend the Navigation Protection Act and to make Consequential Amendments to other Acts received Royal Assent. The new IAA and its regulations establish the legislative basis for the federal EA process. The Regulations Designating Physical Activities (the Project List) define the types of projects that may require an EA and were published in the Canada Gazette, Part II, on August 21, 2019. The Information and Management of Time Limits Regulations were also published at this time.

The IAA focuses federal reviews on projects that have the potential to cause significant adverse environmental effects within areas of federal jurisdiction. Proponents must review the Project List to determine whether the proposed project/activities will require a Federal EA. If the proposed project/activities of this Project are listed within the Project List, a Project Description must be prepared for submission to the Impact Assessment Agency (and other federal authorities, if applicable) to discuss and confirm the applicability of the Federal EA process.

Based on a review of the Project List, the physical activities listed in **Table 6-1** may be relevant to the Project and were therefore reviewed in the context of the Project.

TABLE 6-1: IMPACT ASSESSMENT ACT PHYSICAL ACTIVITY ASSESSMENT

Section within Regulations Designating Physical Activities (Canada Gazette, Part II, 2019)	Description of Designated Physical Activity (Canada Gazette, Part II, 2019)	Proposed as part of the Significant Addendum (Yes/No)
Section 1 a)	The construction, operation, decommissioning and abandonment of a new electrical generating facility or electrical transmission line in a wildlife area, migratory bird sanctuary or protected marine area.	No
Section 1 h)	The construction, operation, decommissioning and abandonment of a new railway line in a wildlife area, migratory bird sanctuary or a protected marine area.	No
Section 11 a)	The construction, operation, decommissioning and abandonment of a new railway line in a national park.	No
Section 54 a)	The construction, operation, decommissioning and abandonment of a new railway line that requires a total of 50 km or more of new right of way and is capable of carrying freight or passengers between cities.	No
Section 54 b)	The construction, operation, decommissioning and abandonment of a new railway yard with a total area of 50 ha or more.	No
Section 55	The expansion of an existing railway yard, if the expansion would result in an increase of its total area by 50% or more and a total area of 50 ha or more.	No

None of the proposed works/infrastructure associated with the Significant Addendum to the project trigger the IA Act based on the review undertaken at the time of writing this report (based on conceptual design). Notwithstanding this, should any changes to the proposed project works or design be made during detailed design, further review of the IA Act triggers will be reviewed to confirm that there are no applicable triggers.

6.3.1.7 Environment and Climate Change Canada

Butternut is protected under the federal Species at Risk Act (SARA). The presence/absence of Butternuts will be confirmed during detailed tree inventories as part of Detail Design. Should any Butternuts be found during detailed tree inventories, appropriate approvals under SARA will be obtained. Parks Canada will also be notified in the event any Butternut trees are identified.

Environment and Climate Change Canada (ECC) is responsible for the Migratory Birds Convention Act (MBCA) and for the Species at Risk Act (SARA). The MBCA protects migratory birds, their eggs and nests. Section 5 of the MBCA prohibits possession of a migratory bird or nest except as authorized by the regulations. The Migratory Bird Regulation (MBR) section 6 prohibits the disturbance or destruction of a nest or egg of a migratory bird, with the exception when a permit is issued. Under the current MBR, a

permit cannot be issued for the incidental take of migratory birds caused by the development of the project.

The SARA protects all wildlife species at risk listed in Schedule 1 of the Act including aquatic species and migratory birds (including their habitat) found on federal and provincial/territorial lands. The Ontario Ministry of Natural Resources and Forestry (MNRF) shares responsibilities with Environment and Climate Change Canada for protecting the habitat of federally listed migratory species.

Nests and eggs of protected migratory birds shall not be destroyed during migratory bird nesting season (April 1 to August 31) to avoid a permit under the Migratory Birds Convention Act. If an active nest of a migratory bird must be damaged or destroyed, a permit under this Act is required.

6.3.1.8 Transport Canada

Transport Canada is responsible for administering the Railway Safety Act (RSA). The RSA governs how construction, operation and maintenance may occur on a railway under legislative authority of parliament. All future project designs must be consistent and conducted within the requirements of the RSA.

Transport Canada is also responsible for administering the Canadian Navigable Waters Act (CNWA), which received royal assent on June 21, 2019. The CNWA is an amendment to the former Navigation Protection Act and is intended to strengthen environmental protection by expanding the regulation of major works and obstructions on all navigable waters, even those not explicitly defined with a Schedule to the Act, such as the Don River. The amended Act still applies to works which are constructed or placed in, on, over, under, through, or across any navigable water.

No additional bridge modifications are anticipated beyond what was identified in the 2017 GO Rail Network Electrification EPR as a result of the additional OCS infrastructure proposed. However, it is noted that the 2017 EPR identified two bridges (Humber River Bridge along Lakeshore West and Holland River Bridge along Barrie) to be modified to accommodate electrification infrastructure spanning waterways that were identified as being navigable under the Navigation Protection Act. As the Navigation Protection Act has been superseded by the CNWA, these modifications will require assessment under the CNWA during detailed design to determine potential impacts to navigability.

Notwithstanding this, *Canadian Navigable Waters Act* provisions will be reviewed during detailed design, and the Contractor shall abide by the requirements of applicable legislation including the CNWA and will submit/obtain all required permits/approvals under the CNWA prior to construction.

Transport Canada is also responsible for administering the Transportation of Dangerous Goods Act (TDGA). The TDGA regulates the transportation of dangerous goods by air, marine, rail and road. At this time none of the activities required as part of the Electrification Project are anticipated to require authorization under this Act. Notwithstanding this, TDGA provisions will be reviewed during detailed design, and the Contractor shall abide by the requirements of applicable legislation including the TDGA.

6.3.1.9 NAVCanada

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.1.10 Greater Toronto Airports Authority

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.2 Provincial

6.3.2.1 Ministry of the Environment, Conservation and Parks

6.3.2.1.1 Environmental Assessment Act – O. Reg., 231/08

The assessment of environmental impacts associated with transit projects such as the GO Rail Network Electrification Project are governed by *Ontario Regulation 231/08 Transit Projects and Metrolinx Undertakings*, under the *Environmental Assessment Act*. In accordance with this regulation, a Significant Addendum to the 2017 Transit Project Assessment Process (TPAP) was carried out as documented in this EPR Addendum. This process commences with the filing of a Notice of EPR Addendum and includes a 30-day public review period. The EPR Addendum is filed with the Director and Regional Director of the Ministry of the Environment, Conservation and Parks (MECP).

6.3.2.1.2 MECP Model Municipal Noise Control Bylaw

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.2.1.3 MECP - Permit to Take Water

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.2.1.4 MECP - Environmental Compliance Approvals

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.2.1.5 MECP - Ontario Water Resources Act

For any private water supply wells that were identified as being located within the property boundaries of the proposed OCS infrastructure at layover/train storage yard facilities as detailed in Section 4, a well survey will be conducted during detailed design to verify if the wells are actually present. If present, these wells and any others identified as part of detailed design should be decommissioned in accordance with Ontario Regulation 903 prior to commencement of any construction activities.

6.3.2.1.6 MECP - Clean Water Act

Ontario's Clean Water Act provides a basic framework for protecting drinking water supplies in the province. This involves identifying and assessing risks to the quality and quantity of drinking water sources to determine which risks are significant; developing a source protection plan to establish how the risks will be addressed; and implementing the plan through land use planning and regulatory mechanisms or voluntary initiatives. The hydrogeological impact assessment referenced as part of this EPR Addendum involved identification and assessment of relevant groundwater and groundwater dependent natural heritage features, including the presence of water supply wells, wellhead protection areas and significant groundwater recharge areas. As part of the hydrogeological impact assessment, potential effects related to the Project were assessed and mitigation measures were identified along with the need for further assessment during the detailed design stage of the project (see Section 4 of this Significant Addendum to the 2017 GO Rail Network Electrification EPR).

With respect to wellhead protection areas and Source Water Protection regulations, these policies will be reviewed in detail as part of the final design phase to confirm their applicability to the electrification project works. At the time of writing this report, in terms of project construction activities, it is acknowledged that there is potential for spills of fuels or other hazardous materials to occur during fueling of construction equipment or other construction activities, which may affect groundwater quality. Therefore, mitigation and commitments to address these effects are outlined in Section 4.9 and Section 6.7.9.

6.3.2.1.7 MECP – Endangered Species Act

If/when potential impacts to Species at Risk are confirmed at detail design, options for reducing or mitigating the impacts to these species will be evaluated, including the implementation of additional timing restrictions. The MECP is responsible for administering the *Endangered Species Act* (ESA). Under this Act, certain activities which occur within regulated habitat, or which involve species at risk require authorizations and approvals from the MECP (as per *Ontario Regulation 242/08*).

Future works and commitments required for Species at Risk, including potential consultation and coordination with MECP, is detailed in Section 6.7.

6.3.2.2 Ministry of the Natural Resources and Forestry

6.3.2.2.1 General

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

Information on new commitments identified for natural environmental resources are identified in Section 4.8.1, Section 4.9.1, **Table 4-123** and **Table 4-124**.

6.3.2.2.2 Forestry Act

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.2.3 Ministry of Heritage, Sport, Tourism and Culture Industries

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

Information on new commitments identified for cultural heritage resources are identified in Section 4.2.3.3, 4.8.3, Section 4.9.3, Section 6.5 and **Table 4-126**.

The Lower Sherbourne Street, Parliament Street, and Cherry Street HIAs (contained in **Appendix C**) should be submitted to the MHSTCI. Upon completion, the final HIAs should be submitted for archival purposes.

Information on new commitments identified for cultural heritage resources are identified in Section 4.8.3, Section 4.9.3, Section 6.5 and **Table 4-126**.

Information on new commitments identified for archaeological resources are identified in Section 4.8.4, Section 4.9.4, Section 6.6 and **Table 4-127**.

6.3.2.4 Ministry of Transportation

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.2.5 Independent Electricity System Operator

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.2.6 Hydro One Networks Inc.

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

Permitting commitments and agreements are discussed further in Section 6.3.3.4.

6.3.3 Municipal

6.3.3.1 Municipal Noise Bylaws

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.3.2 Municipal Sewer Use Bylaws

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.3.3 Municipal Tree Permits

Tree removals occurring outside of Metrolinx property (i.e. private property) will require compliance with municipal by-laws and permits, as well as property owner approval/permission as applicable. Permits related to Municipal Tree By-laws and other applicable municipal tree removal permits will be obtained as appropriate and as outlined in Metrolinx's *Vegetation Guideline (2020),* detailed in Section 6.7.

6.3.3.4 Union Station Rail Corridor Hydro One Conflicts

Any required permits/approvals/agreements will be obtained prior to construction/ implementation of the proposed infrastructure.

Ownership of the relocated Hydro One infrastructure between Lower Sherbourne Street and Don Fleet JCT will be included in an Agreement between Metrolinx and Hydro One, which is subject to ongoing negotiations. Metrolinx will continue to coordinate with the City of Toronto regarding any required Maintenance Agreements.

Discussions regarding utility bridge cladding between Metrolinx, the City of Toronto and Waterfront Toronto are ongoing, along with requests for surface treatments, lighting and aesthetics. The current design does not preclude future treatments, and are subject to separate negotiations with Metrolinx.

Additionally, Metrolinx and Hydro One have identified the need to locate an additional Hydro One transmission structure (i.e., steel monopole) between the Lower Don Valley River and Corktown Common to accommodate clearance requirements for the USRC Overhead Catenary System (OCS). A future addendum is to be completed to address environmental assessment requirements; at which time the significance of potential impacts will be determined as outlined in Section 6.22 below.

<u>General Maintenance</u>

Throughout the operating life of the underground cables, preventative and emergency maintenance will be carried out to ensure that the equipment operates according to design parameters and ensure compliance with Hydro One standards and regulatory requirements to maintain a safe and reliable electricity transmission system.

When the transmission infrastructure becomes obsolete or unserviceable, the equipment will be retired from service in accordance with the applicable standards and legislation of that time. Hydro One will be responsible for maintenance of the utility bridges.

6.3.4 Conservation Authorities

No additional general commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.3.4.1 Toronto Region Conservation Authority

The following commitments specific to the Toronto and Region Conservation Authority (TRCA) will be adhered to during detailed design and construction:

- Ensure that TRCA's Stormwater Management guidelines are adhered to during detailed design for OCS at new layover/storage yard facilities;
- Complete a detailed hydraulic analysis which will consider OCS at new layover/storage yard facilities within a floodplain during detailed design;
- Continue to explore options for low impact development at the proposed Unionville Storage Yard facility site;
- The TRCA will be engaged, as required, during detailed design through the established Voluntary Project Review process. Through this process, TRCA will complete a comprehensive review of the project and provide an opinion with respect to the interests, objectives, and tests of TRCA's permit requirements under Section 28 of the Conservation Authorities Act and under Ontario Regulation 166/06 – Toronto and Region Conservation Authority (TRCA): Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses as it relates to the electrification project works. This may include a review as to potential impacts to flooding, erosion, pollution and conservation of land; and
- Further discussions and consultation with TRCA will be undertaken as appropriate during detail design.

6.3.4.2 Conservation Halton

The following commitments specific to Conservation Halton (CH) will be adhered to during detailed design:

- CH will be engaged, as required, during detailed design through the established Voluntary Project Review process. Through this process, CH will complete a comprehensive review of the project and provide an opinion with respect to the interests, objectives, and tests of CH's permit requirements under Section 28 of the Conservation Authorities Act. This may include a review as to potential impacts to flooding, erosion, pollution and conservation of land; and
- Further discussions and consultation with CH will be undertaken as appropriate during detail design.

6.3.4.3 Lake Simcoe Region Conservation Authority

The following commitments specific to Lake Simcoe Region Conservation Authority (LSRCA) will be adhered to during detailed design:

- LSRCA will be engaged, as required, during detailed design through the established Voluntary Project Review process;
- Ensure that LSRCA's Low Impact Development (LID) guidelines are adhered to during detailed design for projects within the Lake Simcoe Watershed, as applicable; and
- Further discussions and consultation with LSRCA will be undertaken as appropriate during detail design.

6.3.4.4 Central Lake Ontario Conservation Authority

The following commitments specific to Central Lake Ontario Conservation Authority (CLOCA) will be adhered to during detailed design:

- CLOCA will be engaged, as required, during detailed design through the established Voluntary Project Review process;
- Further discussions and consultation with CLOCA will be undertaken as appropriate during detail design.

6.4 Design/Engineering Commitments

6.4.1 OCS Attachments

No additional OCS attachment modifications or commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.4.2 Bridge Modifications

No additional bridge modifications or commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

Refer to Section 6.3.3.4 for commitments related to the USRC Hydro One Conflicts and associated utility bridges.

6.4.3 Construction Staging Areas

The locations of construction staging areas will be identified during detailed design. As these areas were unknown at the time of preparing this EPR Addendum, any potential environmental impacts and mitigation associated with construction staging areas have not been assessed. Therefore, any additional mitigation or monitoring measures that will be necessary to avoid or offset potential impacts related to the physical footprint and/or construction activities to be carried out at construction staging areas will need to be reviewed at the detailed design stage and subsequently implemented. Any associated EPR Addendum requirements will also be identified.

6.4.4 Grounding and Bonding

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.4.5 Phasing Strategy and Rolling Stock

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.4.6 Maintenance Plans/Operational Procedures

Operations and maintenance impacts are detailed further in Section 4.8.

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.4.7 New OCS Maintenance of Way Facilities

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.4.8 Freight Operations/VIA Rail

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.4.9 Construction Management Plans/Traffic Management Plans

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.5 Built Heritage Resources and Cultural Heritage Landscapes

6.5.1 General

Table 4-126 outlines the additional commitments that will be followed and adhered to by Metrolinx (or their Contractor) during detailed design, construction, and operation.

6.5.2 Additional Heritage Studies/Heritage Impact Assessments

Based on the cultural heritage assessment undertaken, a SCP should be completed for the Lower Sherbourne Street, Parliament Street, and Cherry Street USRC Bridges to guide short and long-term conservation of the structures.

6.5.3 Additional Affected Heritage Resources

Construction activities associated with the installation of OCS infrastructure may result in limited and temporary adverse vibration impacts to known and potential BHRs or CHLs. To ensure the BHRs or CHLs are not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure/property will be subject to vibration impacts, and avoidance is not feasible, a qualified engineer should undertake a conditions assessment of the structures within the vibration zone of influence. Further, commitments to repair any damages caused by vibrations will be considered and implemented as appropriate.

The identified heritage attributes of the Lower Sherbourne Street USRC Bridge are anticipated to be impacted through the addition of a Hydro One utility bridge on the south elevation[97]. The proposed works are anticipated to have minor indirect impacts on the bridge, such as visual impacts due to the introduction of new infrastructure and potential vibration impacts during construction and which can be appropriately mitigated through implementation of a monitoring program. No permanent, negative impacts to the bridge are anticipated as the proposed installation of the Hydro One utility bridge is considered to be reversible, and could be removed in the future if operational priorities change.

The identified heritage attributes of the Parliament Street and Cherry Street USRC Bridges are anticipated to be impacted through the addition of a Hydro One utility bridge on the east and west wingwalls on the south side of the rail corridor. The proposed intervention is anticipated to have direct impacts on the USRC bridges with alterations to the concrete wingwalls, potential vibration impacts, soil disturbance, and the introduction of new visual elements.

As such, the following mitigation measures should be undertaken and implemented:

- The Hydro One utility bridge will result in minor indirect impacts to the Lower Sherbourne Street Bridge, and minor permanent, direct impacts to the decorative cast-in-place concrete wingwalls on the south elevation of the Parliament Street and Cherry Street USRC Bridges. Mitigation measures outlined in this report have been prepared to minimize these impacts, and should be implemented as appropriate to the extent practicable.
- Concrete removals on the east wingwall to the south of the rail track should be designed to retain the existing ‘1928’ date stamp on the south portion of the east abutment of the Cherry Street USRC Bridge. Construction and staging should be planned to allow for the proposed modifications of the east wingwall in a manner that retains this date stamp in situ. According to preliminary design drawings, which depict the proposed concrete removals as minor in scale relative to the overall size of the wingwalls, the date stamp will not be impacted in the proposed concrete removals or additions.

[97] The utility bridge is to be affixed to the expanded Lower Sherbourne Street Subway bridge, as documented and approved in the 2018 Union Station Rail Corridor East Enhancements EPR.

- Intervention should be planned to limit the visual impacts of the modifications, where feasible, based on technical constraints and road clearance requirements of the Parliament Street and Cherry Street USRC Bridges. In order to reduce the visual impacts of the utility bridge, planning should ensure that the intervention is compatible with the PHP. Similarly, consideration should be given to using materials, colours, and finishes that will make the utility bridge physically and visually compatible with, subordinate to, and distinguishable from the surrounding landscape and the three (3) USRC bridges.
    - The preliminary designs with aluminum louvres painted to be complementary with the setting is considered to be a suitable means of reducing visual impacts of the basic version of the structure and should be implemented in the final design, where feasible. To ensure that the deck fascia on the south elevation of the Parliament Street and Cherry Street USRC Bridges are not isolated or visually obstructed from the public, the protective cladding should be minimized and designed at a limited scale, where feasible, and the cladding should be installed in a manner that does not physically impact the deck fascia. As part of the final detailed design, the orientation of the louvred fin cladding on the USRC bridges should be selected to be consistent among all three (3) structures. In this respect, a design should be selected that is appropriate for use in the Lower Sherbourne Street USRC Bridge, Parliament Street USRC Bridge, and the Cherry Street USRC Bridge, to maintain a compatible and cohesive aesthetic for the entire Hydro One Conflict study area.
    - New concrete utility bridge abutments extending from the existing wingwalls should be constructed to be complimentary to the 1927-1928 decorative cast-in-place concrete wingwalls of the Parliament Street and Cherry Street USRC Bridges. In this respect, consideration should be given to implementing a decorative panel design on the face of the new abutment faces and to use colours and finishes similar to the existing wingwalls to ensure visual compatibility. By implementing suitable decorative finishes and colours on the new utility bridge abutments, the visual impacts of the concrete additions would be decreased. In consultation with the Project Delivery Team (PDT) and a qualified person with recent, relevant heritage experience the new concrete utility bridge abutments will be designed to match the existing wingwalls of the Parliament Street USRC Bridge.
    - Additional modifications to the Parliament Street USRC Bridge, that may be required to address technical or safety considerations should be designed to be compatible with the bridge and with the Lower Sherbourne Street and Cherry Street USRC Bridges. In consultation with the PDT and a qualified person with recent, relevant heritage experience, the guardrails and fencing on the bridge and wingwalls will have a contemporary design and be compatible with the other USRC bridges at the request of the Waterfront Toronto Design Review Panel.
    - The preliminary designs should be reviewed prior to finalization (at the 90% completion milestone, for example) by a qualified person with recent, relevant heritage experience to confirm that visual impacts have been suitably minimized and that the materials, colours, and finishes are compatible with the PHPs. A qualified person will be required to review detailed design drawings of the utility bridge, including cladding options[98] to determined compliance with the recommendations of this Report.
- All interventions should be designed to be reversible. In this respect, the proposed solution should be designed in a manner that is reversible should the Hydro One utility bridge be removed in the future. According to available documentation, the proposed solution is reversible for the Lower Sherbourne USRC Bridge. The removal of the original concrete on the wingwalls of the

[98] Bridge cladding option are subject to change as there is the potential for enhanced options depending on 3rd party requests.

Parliament Street and Cherry Street USRC Bridges is considered to be irreversible. However, should operational priorities change, the utility bridge and associated abutments could be removed, and the original cast-in-place concrete wingwalls could be repaired to match the original construction. While irreversible and permanent, careful and sympathetic rehabilitation could functionally and visually return the Parliament Street and Cherry Street USRC Bridges to their original state should the Hydro One utility bridges be removed in the future.

- Additional indirect temporary negative impacts are anticipated as a result of soil disturbance adjacent to the wingwalls of the Parliament Street and Cherry Street USRC Bridges to facilitate concrete removals and to construct the new utility bridge abutments. Where feasible, soil disturbance should be limited to the areas required for removals and abutment construction, and post-construction grading should be employed to return the slope adjacent to the wingwalls to its pre-construction conditions.
- The proposed intervention should be carried forward with an emphasis on decreasing the physical and visual impacts of the proposed works where practicable. The detailed design and implementation of interventions at the three (3) USRC bridges should be guided by a qualified person(s) with individual expertise, recent experience and knowledge relevant to the type of cultural heritage resources being considered and the nature of the activity being proposed, such as a heritage engineer, architect, or conservator with recent and relevant experience in the conservation of cultural heritage resources. Qualified persons should have specialized knowledge and expertise with recent experience with the conservation of road and/or rail bridges. Membership in good standing with the Canadian Association of Heritage Professionals (or comparable accredited organization) in a relevant area of practice is considered to be an asset.
- Construction and staging should be suitably planned and executed to ensure that there are no unintended impacts to the three (3) USRC bridges. The contractor responsible for construction should be informed of the cultural heritage value of the structure and no-go zones with fencing or other barriers should be installed adjacent to the work zone prior to construction, if feasible to obstruct pedestrian and vehicular traffic, to ensure there are no additional impacts.
- To ensure the bridge is not adversely impacted during construction, a qualified engineer should undertake a condition assessment of the structures within the vibration zone of influence. Further, Metrolinx must make a commitment to repair any damages caused by vibrations.
- The HIAs should be submitted in draft form for review and comment to the City of Toronto Heritage Preservation Services, the MHSTCI, Waterfront Toronto, and any other relevant heritage stakeholder with an interest in this project. Upon completion, the final HIAs should be submitted to the City of Toronto and other applicable stakeholders for archival purposes.

6.6 Archaeological Resources

6.6.1 General

The following general archaeological mitigation measures will be adhered to and implemented:

- All work shall be performed in accordance Applicable Law, including but not limited to the *Ontario Heritage Act*, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), formerly the Ministry of Tourism, Culture and Sport (MTCS) Standards and Guidelines for Consultant Archaeologists (2011), and the MHSTCI document, Engaging Aboriginal Communities in Archaeology: A Draft Bulletin for Consultant Archaeologists in Ontario (2011).
- Applicable recommendations for additional work from completed Archaeological Assessment Reports will be implemented and complied with.
- In the event that archaeological materials are encountered or suspected of being encountered during construction, all work will cease. The location of the findspot should be protected from

impact by employing a buffer in accordance with requirements of the MHSTCI. A professionally licensed archaeologist will be consulted to complete the assessment. If materials are confirmed to possess cultural heritage value/interest then they will be reported to the MHSTCI, and further Archaeological Assessment of the materials may be required. If it is determined that there is a potential for Indigenous artifacts, Metrolinx should be contacted, and Applicable Law will be followed.

- If final limits of the Project footprint are altered and fall outside of the assessed study area, additional Archaeological Assessments will be conducted by a professionally licensed archaeologist prior to disturbance and, prior to construction activities. This will include completing all required Archaeological Assessments resulting from the Stage 1 Archaeological Assessment (Stage 2, Stage 3 and Stage 4, as required) as early as possible, prior to the completion of design, and in advance of any ground disturbance.
- For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, additional Archaeological Assessment will be conducted by a professionally licensed archaeologist prior to disturbance.
- The Stage 2 Archaeological Assessment Report(s) will be submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, RSO 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological field work and report recommendations ensure the conservation, preservation and protection of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed and the archaeological report recommending no further concerns has been reviewed for consistency with the Standards and Guidelines for Consultant Archaeologists to the satisfaction of the Ministry of Heritage, Sport, Tourism and Culture Industries, a letter will be issued by the ministry referencing these recommendations and stating that the report has been entered into the Ontario Public Register of Archaeological Reports.
- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological field work on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.
- Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48(1) of the *Ontario Heritage Act* and may not be altered, nor may artifacts be removed from them, except by a person holding an archaeological license.
- Implement all mitigation measures outlined in this report.

6.6.2 Previously Undocumented Archaeological Resources

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the *Ontario Heritage Act*.

6.6.3 Barrie Corridor Specific Requirements

6.6.3.1 Allandale Site (BcGw-69)

Stage 4 Protection and Avoidance strategy will be implemented for any portion of the Allandale site (BcGw-69) near the Historic Allandale Station (along the Barrie Corridor) to be impacted by construction associated with electrification (e.g., the OCS, 2X25 kV feeder route, etc.). This will be reviewed and confirmed during detailed design and if required, the Stage 4 Protection and Avoidance strategy will be implemented prior to construction.

6.6.4 Discovery of Human Remains

If human remains are encountered or suspected of being encountered during project work, all activities must cease immediately and the local police/coroner as well as the Bereavement Authority of Ontario on behalf of the Ministry of Government and Consumer Services must be contacted. Archaeological investigations of human remains will not proceed until police have confirmed the remains are not subject to forensic investigation. Once human remains have been cleared of police concern, the MHSTCI will also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*. If the human remains are determined to be of Indigenous origin, Metrolinx should be contacted, and all applicable law must be adhered to.

The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

6.6.5 Engagement with Indigenous Nations & Organizations

All Archaeological Assessment findings will be shared with Indigenous Nations and organizations, as per Metrolinx's procedures.

6.6.6 Stage 2 Archaeological Assessment Studies

The following additional Stage 2 Archaeological Assessment Studies were identified through the EPR Addendum studies undertaken to date and will be completed as early as possible during detailed design.

TABLE 6-2: SUMMARY OF FURTHER ARCHAEOLOGICAL ASSESSMENT RECOMMENDED

Corridor	Segment	Next Assessment Steps
Union Station Rail Corridor	Parliament Street to Cherry Street	Stage 2 Monitoring if construction reaches a depth of 76 m ASL. Exact locations and depth of excavation to be confirmed prior to construction of underground utility corridor.
Lakeshore West	Walkers Line Layover	Stage 2 Test Pit Survey
Barrie	BR-12 – within a 200 metre radius of Allandale site (BcGw-69) near Historic Allandale Station and new Allandale Waterfront GO Station	Stage 2 Test Pit Survey

6.6.7 Stage 3 & 4 Archaeological Assessment Studies

Based on the results and recommendations of the completed Stage 2 Archaeological Assessments, any required Stage 3 and/or 4 archaeological assessments will be carried out as required during detailed design. Associated recommendations for avoidance/mitigation will also be complied with.

6.7 Natural Environment

6.7.1 General

The following general natural environmental mitigation measures will be adhered to and implemented:

- Implement all mitigation measures outlined in Section 4.
- An Environmental Inspector be present during construction activities associated with the GO Rail Network Electrification project. They will ensure that all environmental mitigation measures are properly installed, implemented and maintained during construction of the GO Rail Network Electrification project components;
- Further investigations may be required to delineate the boundaries of natural features associated with the Natural Heritage System (NHS) and within Designated Areas to accurately predict impacts to these sensitive areas and develop avoidance strategies and/or compensation for losses within these areas. During construction, should vegetation removals be required within the migratory bird window of April 1st to August 31st, a survey for migratory bird nests will be required prior to any vegetation removals; and
- Further consultation with relevant Conservation Authorities and municipalities will be required to finalize appropriate restoration and/or compensation to be completed in accordance with Metrolinx's *Vegetation Guideline* (2020).

6.7.1.1 Construction Mitigation

Measures to mitigate impacts to natural environmental features during construction are detailed in Section 4.9.1.

6.7.2 Integrated Vegetation Management (IVM)

Prior to commencement of construction, an Integrated Vegetation Management (IVM) Plan will be developed and implemented that adheres with the IVM framework outlined in the Metrolinx's *Vegetation Guideline* (2020). The Guideline's selection criteria will be used to assess the vegetation present as compatible or incompatible, and manage it, if necessary, in a way which meets safety needs in a timely manner, is sensitive to environmental conditions, and maximizes cost-effectiveness.

The presence, density, and location of compatible and incompatible species will be monitored as per the frequency and methodology established in the Bi-Annual Monitoring Program consistent with the Metrolinx's *Vegetation Guideline* (2020). The Bi-Annual Monitoring Program will be made up of pre-treatment and post-treatment monitoring events that will be carried out via field, aerial, and high-rail vehicle or train surveys conducted by qualified specialists.

6.7.3 Tree Inventories/Arborist Report

- An Arborist Report will be prepared which meets regulatory requirements and is completed by an I.S.A. Certified Arborist. The report will also be completed with regard to the Ontario Forestry Act R.S.O. 1990, the Metrolinx's *Vegetation Guideline* (2020), the Endangered Species Act, and other regulations, municipal by-laws and best management practices as applicable.
- The Arborist Report will include, but not be limited to the individual identification of all trees within the Project Study Area including those that require removal or preservation, or trees that may be injured as a result of the Project. Trees to be identified within the Project Study Area will include those on Metrolinx property, trees on public and private lands, and boundary trees. For trees that are not within Metrolinx owned lands consideration must be given to applicable Municipal by-laws to dictate the minimum Diameter at Breast Height (DBH) which requires inventory and additional requirements for tree inventories and tree protection plans. The Arborist Report will include all information needed to establish compensation ratios and tree end use (including identification of high value trees) as per Metrolinx's *Vegetation Guideline* (2020). For trees within

Metrolinx owned lands the *Vegetation Guideline* (2020) is to be followed. As part of the Arborist Report, all trees within or adjacent to the Project Footprint that will be removed or injured as part of the Project will be inventoried, including Butternut and any other SAR tree.

- Tree inventory/arborist work is currently being completed as part of a separate undertaking, the Metrolinx Vegetation Removal and Compensation Program. Based on Metrolinx's *Vegetation Guideline* (2020) and data collected as part of the current and future studies, a detailed Vegetation Management Plan will subsequently be developed.
- Each Butternut that may potentially be removed or impacted must be assessed by a qualified Butternut Health Assessor, in accordance with MNRF Butternut Assessment Guidelines (2014). The Assessor will prepare a Health Assessment Report for submission to MECP to determine the next course of action.

6.7.4 Tree Protection

Detailed measures to protect retained adjacent trees will be implemented during construction. This will include establishing Tree Protection Zone (TPZ) limits, compliance with Metrolinx's *Vegetation Guideline* (2020), diagram of tree protection barrier type, tree protection measures, and construction storage and staging areas where information is available.

6.7.5 Vegetation Removals & Compensation Plan

Metrolinx has established a vegetation compensation approach for determining and implementing compensation for the removal of trees from the Metrolinx ROW as well as public and private lands. It is a landscape, science-based approach designed to reflect the basic principles of the TRCA's ecosystem-based approach in addition to following the requirements of applicable bylaws. Compensation will follow one or a combination of the following approaches: ecological, baseline, or bylaw.

- **For Trees within Metrolinx Property**: All trees within the Metrolinx ROW will be compensated for using either an ecological or baseline approach. Where tree removals are located within a designated natural area, ecological compensation will be implemented. Where removals are outside a designated natural area, a 1:1 ratio approach will be implemented (baseline compensation).
- **For Public/Private Trees**: Compensation for trees within public and private lands, including those on the boundary between the Metrolinx ROW and public or private lands, will follow with the requirements of applicable bylaws. Trees on public or private lands that are not subject to bylaws/regulations will be compensated for following an ecological or baseline approach. Metrolinx will work directly with residents to address the loss of trees on private property.
- **Tree End Use**: Options for the end use of trees removed from Metrolinx property (e.g. reuse/recycling options) will be developed as per the recommendations in the guideline.

In addition to the mitigation and monitoring measures outlined in Section 4 of this report, the following commitments will be adhered to with respect to any project activities that involve tree / vegetation removals, injury and/or protection:

- If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's *Vegetation Guideline* (2020).
- Prior to the undertaking of tree removals, a Tree Removal Strategy, building upon the considerations and elements set out in the Metrolinx's *Vegetation Guideline* (2020), will be developed and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections.
- Compensation for tree / vegetation removals will be undertaken in accordance with Metrolinx's *Vegetation Guideline* (2020).

- Vegetation removals will also consider and mitigate potential impacts to sensitive species, e.g., migratory birds and Species at Risk (SAR), and features, e.g., Designated Natural Areas and Significant Wildlife Habitat. Refer to Natural Environment commitment tables for additional details.
- Removal of ash trees, or portions of ash trees, will be carried out in compliance with the Canada Food and Inspection Agency Directive D-03-08: Phytosanitary Requirements to Prevent the Introduction into and Spread within Canada of the Emerald Ash Borer, Agrilus planipennis (Fairmaire) (2014), as amended from time to time. To comply with this Directive, all Ash trees requiring removal, including any wood, bark or chips, will be restricted from being transported outside of the emerald ash borer regulated areas of Canada unless authorized by a Movement Certificate issued by the CFIA, moving these products out of the Regulated Area is prohibited. This is necessary to prevent the spread of the Emerald Ash Borer (EAB) to un-infested areas in other parts of Ontario and Canada. The Contractor must dispose of all wood at a registered waste facility.
- Complete Arborists reports/additional study requirements as detailed above in Section 6.7.3.
- The success of vegetation compensation activities will be monitored in accordance with Metrolinx's *Vegetation Guideline* (2020). The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning.
- Monitoring requirements will be undertaken in accordance with conditions of permits and approvals.
- Monitoring and management of trees/vegetation within the rail corridor right-of-way will be undertaken in accordance with the Integrated Vegetation Management (IVM) framework outlined in Metrolinx's *Vegetation Guideline* (2020).

6.7.6 Species at Risk

General mitigation and management strategies to protect Species at Risk, along with commitments for futures studies are detailed in **Table 4-124**. All requirements of the Endangered Species Act (ESA) and Species at Risk Act (SARA) will be met. Compliance with any authorizations and approvals from the MECP with respect to Species at Risk shall be undertaken.

6.7.6.1 Butternut

The presence/absence of Butternuts will be confirmed during Detailed Design. Should any Butternuts be identified, a health assessment will be required for any pure butternuts. Dependent on number and conditions of individuals found, approval under the ESA, 2007 may include a registration and/or permitting process. Protective measures for any Butternuts within 50 metres of the construction footprint that do not need to be removed, shall be implemented.

6.7.6.2 Bats

Species at Risk bat habitat will be confirmed as part of more detailed studies that will be completed during detailed design, including snag/cavity tree density surveys which will be completed during leaf-off seasons prior to construction. Where forested communities require vegetation removals, further studies (e.g. maternity roost surveys, and acoustic monitoring) may be required to confirm the presence/absence of Species at Risk bat habitat. Where Species at Risk bat habitat is confirmed, consultation with the MECP will be required to determine the appropriate field studies, approval or permitting requirements. Specifically as part of detailed design and permitting, the Bat Protocol will be discussed with MECP/MNRF in relation to applicability and preferred approach for any required permits/approval as it relates to the Electrification Project works. Any required MECP/MNRF permits/approval will be obtained prior to project implementation.

Where vegetation removal in Significant Bat Maternity Colony Habitat is confirmed through snag/cavity tree density surveys, vegetation removal activities will be scheduled to occur outside of the bat roosting

season of April 1st to September 30th and strictly cannot occur during the bat maternity period of June 1st to July 31st. If this is not possible, tree removal could occur outside of the bat maternity period in confirmed Significant Bat Maternity Colonies provided that exit surveys and/or acoustic monitoring are completed 24 hours prior to vegetation removal to ensure suitable cavity trees are not occupied by maternity colonies.

6.7.6.3 Barn Swallow

If construction activities are scheduled during the nesting season for Barn and/or Bank Swallow (April 1st to August 31st), a nest search will be undertaken to confirm that no Barn and/or Bank Swallow are nesting on structures or banks that may be affected by construction activities on or near these areas. If possible, the area will be netted prior to nesting season to dissuade use of these areas for nesting.

Where loss or disturbance cannot be avoided (e.g., due to work on bridges or banks), all requirements under the ESA will be met, including any registration, compensation, replacement structures and/or permitting requirements.

6.7.6.4 Bank Swallow

There are no anticipated impacts to Bank Swallow, as no habitat has been identified in proximity to the study area. Potential impacts to Bank Swallow habitat may occur as a result of construction activities e.g., creating habitat for them such as uncovered stockpiles or vibration effects to adjacent habitat along the corridor.

The following mitigation commitments will therefore be followed to prevent Bank Swallows from nesting on site during electrification project construction activities:

- Avoid vertical faced slopes (either 20 degrees more or 20 degrees less than a 90 degree angle).
- Stockpiles and exposed slopes should be covered or netted prior to the start of the breeding bird window (April 1st) and maintained until the end of breeding season (August 31st).
- No vegetation removal, grading or construction with heavy equipment will occur within 50m of the bluff during the Bank Swallow breeding period (May 1st to July 31st).

6.7.6.5 Redside Dace

If Redside Dace is present, design and construction will occur in accordance with MNRF's Guidance for Development Activities in Redside Dace Protected Habitat (2016). Redside Dace are protected by the timing window of April 30th to September 31st.

Further consultation with the MECP/MNRF is required during detail design regarding works proposed within Redside Dace regulated habitat to determine the permitting or approval requirements (if applicable) under the *Endangered Species Act.*

6.7.7 Migratory Bird Species

All works must comply with the *Migratory Birds Convention Act* (MBCA), including timing windows for the nesting period (April 1st to August 31st in Ontario. Active nests and eggs of protected migratory birds should not be destroyed at any time and site-specific mitigation should be developed in consultation with the Canadian Wildlife Service.

General mitigation and management strategies to protect migratory birds, along with commitments for futures studies are detailed in **Table 4-124**.

6.7.8 Capture or Handling of Fish or Wildlife

Any capture/handling/release of fish, specially protected invertebrates or wildlife may require an authorization/licence under the FWCA.

6.7.9 Sediment and Erosion

An Erosion and Sediment Control Plan, in accordance with the TRCA Erosion and Sediment Control Guide for Urban Construction (2019), will be prepared prior to and implemented during construction to minimize the risk of sedimentation to the waterbody. Additional mitigation measures/commitments that will be implemented in order to reduce or mitigate the potential for adverse effects caused by sediment and erosion include:

- Adhere to relevant guidelines and Ontario Provincial Standard Specifications relating to proper sediment and erosion controls including consideration of TRCA's Erosion and Sediment Control Guide for Urban Construction (2019) and Ontario Provincial Standards Specifications (OPSS) – OPSS 805 (Erosion and Sediment Control Measures);
- Where temporary storage of the soil is required, the soil will be stored immediately adjacent to the excavation site;
- Topsoil and subsoil will not be mixed nor will topsoil be contaminated with any other material;
- Silt fencing will be installed around all designated work areas to prevent any offsite transport of sediment;
- Exposed soils will be hydroseeded within 45 days, both for temporary work areas and final grades;
- Existing vegetation on embankments shall be maintained as long as possible and exposed areas shall be stabilized as soon as possible by seeding and mulching;
- Appropriate lengths of silt fencing will be installed along the perimeter of minimized, designated work areas to limit construction impacts;
- Design and implement erosion and sediment controls to contain/isolate the construction zones, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment to any watercourses, and ensure sites are stabilized prior to removal following construction;
- Stockpiles to be located at a minimum of 30 metres from watercourses and isolated to ensure material will not enter any watercourse or ditchline. All stockpiles are to be removed upon completion of the works and the site restored, as appropriate; and
- Limit access to waterbody and banks to protect riparian vegetation and minimize bank erosion.

Additional measures and commitments to mitigate erosion and sediment impacts are detailed in **Table 4-124**.

6.7.10 Spills

An Emergency Preparedness and Response Plan will be prepared prior to commencing construction and will govern spill response and ensure proper mitigation and notification procedures are in place during construction.

Additional mitigation measures to manage and address spills during construction are detailed in Section 4.9.1.

6.7.11 Invasive Species

The Integrated Vegetation Management (IVM) Plan will be developed in accordance with Metrolinx's *Vegetation Guideline* (2020), which will include details on managing invasive plant species during construction.

Further details on managing invasive species, including invasive insects such as Emerald Ash Borer (*Agrilus planipennis Farmaire*) and Asian Long-horned Beetle (*Anoplophora glapripennis*) are detailed in Section 4.9.1 and **Table 4-123**.

6.8 Contaminated Soil / Groundwater

Metrolinx is currently in the process of completing a system-wide Due Diligence study to assess the potential for contaminated materials to be encountered through the completion of Environmental Site Assessment studies, as required. As such, no additional assessment is recommended at this time.

6.8.1 Groundwater

A Groundwater Monitoring Plan (GMP) will be developed prior to construction to guide the handling, management, and disposal of groundwater encountered during the works. The GMP will comply with Ontario Regulation 406/19 (On-Site and Excess Soil Management – enacted into law on January 1, 2021), 64/16 and 387/04, as amended under the *Ontario Water Resources Act*.

The GMP will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the Works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMP will outline general groundwater monitoring considerations during the Works and provide guidance for groundwater monitoring following the Works where considered applicable. The GMP will describe the anticipated groundwater quantity and dewatering Zone of Influence that will be encountered during the Works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) from the MECP, or an Environmental Activity Sector Registry (EASR). The GMP will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the Works, and approvals for the water disposal, and or treatment if applicable based on the quantity and quality.

The Groundwater Management and Dewatering Plan will be reviewed and approved by Metrolinx prior to construction. The following monitoring commitments will also be complied with and implemented:

- A Groundwater Management Monthly Dashboard Report will be developed by the Contractor for Metrolinx's review to document performance monitoring data/results and any corrective actions implemented during the previous month.
- Upon completion of the work, the Contractor will submit a Groundwater Management and Dewatering Implementation Report to Metrolinx.

At the Midland Layover, appropriate dewatering strategies will be determined and confirmed in coordination with the City of Toronto.

6.8.2 Contaminated Soils

A Soil and Excavated Materials Management Plan will be developed for the handling, management and disposal of all excavated material (i.e. soil, rock and waste) that is generated or encountered during the work. The plan will be overseen by a Qualified Person pursuant to Ontario Regulation 153/04 under the Environmental Protection Act (QP) and will comply with Ontario Regulation 406/19 (On-Site and Excess Soil Management – to be enacted into law on January 1, 2021), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices (April 2019, as amended) and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement, as applicable.

- Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per Ontario Regulation 347 (as amended) and all Applicable Law.

- The Soil and Excavated Materials Management Plan will be reviewed and approved by Metrolinx prior to construction.
- Develop a Groundwater Management and Dewatering Plan to guide the handling, management, and disposal of groundwater encountered during the works. The Groundwater Management and Dewatering Plan will be overseen by a QP and will comply with Ontario Regulations 406/19 (On-Site and Excess Soil Management – enacted into law on January 1, 2021), 64/16 and 387/04, as amended under the Ontario Water Resources Act.
- The Groundwater Management and Dewatering Plan will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement. The Groundwater Management and Dewatering Plan will outline general groundwater monitoring considerations during the works and provide guidance for groundwater monitoring following the works where considered applicable.
- The Groundwater Management and Dewatering Plan will describe the anticipated groundwater quantity and dewatering Zone of Influence that will be encountered during the works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) or an Environmental Activity Sector Registry (EASR) from the MECP.
- The Groundwater Management and Dewatering Plan will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the works, and approvals for the water disposal, and/or treatment if applicable, based on the quantity and quality.
- The Groundwater Management and Dewatering Plan will be reviewed and approved by Metrolinx prior to construction.

6.9 Stormwater Management

Based on the Preliminary SWM assessments undertaken and referenced as part of this Significant Addendum and consultation with Conservation Authorities (CA), OCS infrastructure proposed to electrify the Walkers Line Layover Facility and the Unionville Storage Yard was determined to be partially within CA Regulated Areas. The Midland Layover Facility was determined not to be within a CA Regulated Area. Each facility will be designed such that flooding will not affect proper functioning of the facility and will not result in adverse environmental effects. Detailed Stormwater Management Plans/Designs, including OCS infrastructure will be developed during detailed design in consultation with Conservation Authorities and other applicable review agencies, as appropriate.

The following general commitments related to stormwater management for OCS infrastructure will also be fulfilled during detailed design, as appropriate:

- A detailed Stormwater Management Plan/Design will be carried out and will address quantity control, quality control, water balance, and erosion and sediment control, and quality control;
- The proposed development areas used in the preliminary SWM assessment were based on conceptual design; therefore, reassessment of the drainage areas and surrounding areas (contributing and outletting) will be required during detailed design;
- Each layover/storage yard facility including associated OCS infrastructure will be designed such that flooding will not affect proper functioning of the facility and will not result in adverse environmental effects;
- For flood-proofing of the relevant layover sites including associated OCS infrastructure, the facilities will be built 0.3 metres above the floodplain;

- Where sensitive/endangered fish/fish habitat may be identified near the storage yard site during detailed design, the final design of the SWM features shall take these features into consideration to ensure the SWM facilities will not negatively affect aquatic features;
- Review of other disciplines' impact assessment reports that may be applicable to stormwater management is required prior to carrying out detailed design (i.e. Natural Environment, Hydrogeology, Geotechnical, Land Use, etc.);
- Conservation Authorities will be consulted during detailed design to confirm regulation limits and flood lines;
- Coordination for future regional or municipal infrastructure works should be taken in consideration during subsequent design stages; and
- If required, MECP, Regulatory Agencies and relevant municipalities will be contacted for their comments and approvals.

It is acknowledged that more detailed commitments related to stormwater management for the broader construction and operation of the Walkers Line Layover, Unionville Storage Yard and Midland Layover facilities has been captioned within the respective NT&F TPAP and SJGS TPAP EPR's. As electrification infrastructure is a component of these facilities, stormwater management measures will be coordinated as part of future project phases.

6.10 Noise

6.10.1 Operational Noise – Train Service

Metrolinx has committed to a number of service and operational changes to help address operational noise at the source. These measures include:

- An exhaust silencer retrofit program for existing and future Metrolinx diesel locomotives, which will decrease the sound from these trains by an estimated 3 dB at all properties along the corridors;
- Where possible, using 6-car rather than 12-car trains during off-peak periods;
- Using EMUs along the Stouffville and Kitchener corridors;
- Reducing engine idling;
- Grade separations, which reduce noise by avoiding deceleration, idling and acceleration by both road and rail transportation vehicles; and
- Improvements to tracks and switches to reduce vibration and noise.

As part of the detail design phase, noise barriers that were found to be technically and economically feasible will be further assessed to determine their final lengths and locations.

6.10.2 Construction Noise Management Plan

Prior to commencement of construction, the Contractor will develop and submit a detailed Construction Noise Management Plan to Metrolinx. The Construction Noise Management Plan shall:

- Document and commit to all measures to be taken for meeting the noise exposure limits documented in the applicable regulations, bylaws and standards at every directly exposed sensitive receptor and throughout the entire project.
- Determine the Zone of Influence (ZOI) for construction related noise based on the noise exposure limits outlined in the applicable regulations, bylaws and standards and taking into consideration the construction site, staging and laydown sites and hauling routes, each stage of the construction (including demolition), the overall construction schedule along with the schedule of each major component and associated major construction processes and equipment usage.

- Identify all sensitive receptors that fall within the ZOI for construction related noise. Mitigation measures will be proposed for these sensitive receptors, and the effects of the proposed mitigation measures will then be evaluated using noise modelling. If results of the modelling indicate that any sensitive receptors still remain within the ZOI for construction related noise, then the following shall apply:
    - Additional mitigation is proposed and subsequently modelled until the sensitive receptor does not fall within the ZOI; or
    - If mitigation strategies are deemed by Metrolinx to be not viable, receptor-based mitigation will be proposed.
- The Construction Noise Management Plan will include the temporary noise barriers for Midland Layover indicated in the GO Expansion Noise and Vibration Study Report (Stantec/Wood). Where additional work sites are identified which were not assessed as part of the GO Expansion Noise and Vibration Study Report or where construction activities at any given site differ from those considered in this report, the Contractor will conduct modelling to evaluate the need for additional noise barriers and submit results and recommendations as part of the Noise Management Plan.

6.11 Vibration

6.11.1 Operational Vibration – Train Service

Metrolinx has committed to a number of service and operations changes to help address operational vibration at the source. These measures include:

- Maintenance measures: optimal maintenance, wheel-flat detectors, and track continuity.
- Special Track Support System: floating slabs, resiliently supported ties, high-resilience fasteners and ballast mats.
- Rolling stock specification: un-sprung vehicle mass, suspension system design, wheel design, brake system.

As part of the detail design phase, vibration mitigation measures that were found to be technically and economically feasible will be further assessed to determine their final lengths and locations. As part of this assessment, ballast mats were chosen as the assumed form of mitigation, but a final selection on what mitigation measures to use will be made during detail design.

6.11.2 Construction Vibration Management Plan

Prior to commencement of construction, the Contractor will develop and submit a detailed Construction Vibration Management Plan to Metrolinx. The Construction Vibration Management Plan shall address and entail:

- Complete a detailed construction related vibration assessment prior to the commencement of construction that includes assessment of the vibration ZOI. The ZOI for vibration shall be established by using the methodology and input data provided in Section 7.2 of the US FTA Report No. 0123 (2018), Transit Noise and Vibration Impact Assessment Manual (2018).
- Complete pre-construction condition surveys for properties within the vibration ZOI of the planned work to establish their condition and establish a baseline prior to any work beginning.
- Identify any heritage structures and other sensitive structures, buildings or infrastructure vulnerable to vibration damage, assess requirements and, if necessary, develop mitigation measures.
- Identify buildings, where vibration sensitive activities such a sound recording or medical image processing take place, assess requirements and, if necessary, develop mitigation measures.

- Establish a 15-metre setback distance between the construction vibration source and nearby buildings, where possible, to minimize impacts. If this is not possible, then monitor the vibration levels associated with the activity.
- Select construction/maintenance methods and equipment with the least vibration impacts.
- In the presence of persistent complaints and subject to the results of a field investigation, identify alternative vibration control measures, where reasonably available.

In addition, the commitments, mitigation and monitoring measures as outlined in **Table 4-130** will be completed with and implemented.

6.12 Air Quality

6.12.1 Construction Air Quality Management Plan

Refer to Section 4.9 for construction related mitigation and monitoring measures that will be implemented and complied with, including the development of a detailed Construction Air Quality Management Plan (AQMP).

6.12.2 Operational Phase

Refer to Section 4.8 for operations related mitigation and monitoring measures that will be implemented and complied with. In addition, the following future commitments related to Air Quality during operations will be implemented and complied with:

- The Contractor to develop and submit to Metrolinx a detailed Operations Air Quality Management Plan to document the controls and methods that the Contractor will implement during project operations to limit the generation and dispersion of airborne particulate matter and air contaminants associated with the project operations
- Where practicable, the following mitigation measures will be implemented to reduce air contaminant emissions intensity (amount of pollutant emitted per passenger kilometre travelled):
    - Selecting a less polluting form of energy or fuel (i.e., electricity or hydrogen rather than diesel fuel).
    - Deploying engines and propulsion systems that meet higher emission standards.
    - Maintaining engines and emission control equipment to manufacturers' specifications.
    - Retrofitting older diesel engines to higher emission standards at the time of major engine rebuilds.
    - Matching the train consist size with anticipated passenger loads.
    - Deploying diesel multiple units (DMUs) instead of diesel locomotive powered consists.
    - Deploying electric multiple units (EMUs) instead of electric locomotive powered consists.
- The following mitigation measures will be considered and implemented to reduce total air contaminant emissions (amount of pollutant emitted by the entire system over a year):
    - Minimizing unnecessary train / engine / propulsion system idling through technical and operational measures.
    - Minimizing non-revenue equipment runs by better design and planning.
    - Maximizing train passenger load factors by improved system design, planning, marketing and pricing.
    - Optimizing the location and design of pedestrian and cycling accessible stations to limit motor vehicle trips to stations.
    - Promoting transit-supportive development.

- Annually test train propulsion and auxiliary power units, which produces exhaust emissions and ensure that they remain in compliance with applicable Canadian emission standards.
- Develop an Air Sampling and Monitoring Plan in accordance with the Project Agreement and submit an annual report summarizing all sampling and monitoring results accumulated over the preceding year to Metrolinx.

6.13 Visual / Aesthetics

Based on the Visual Impact Assessment and conceptual design prepared and referenced (refer to **Appendix H** for further detail pertaining to the New Track and Facilities Visual Impact Assessment Report) as part of the EPR Addendum, areas of special aesthetic consideration were identified. These areas were classified as high or moderate visual impact areas within the Study Area, as listed below. Special consideration will be given to these areas during detailed design, as outlined in the subsections below, to enhance the aesthetic aspects of the electrification infrastructure wherever possible.

6.13.1 Areas along Rail Corridors

Areas classified as high or moderate potential visual impact areas along the rail corridors through the Visual Impact Assessment have been summarized in **Table 6-3**. Refer to **Appendix N – Corridor Conceptual Mapping** for applicable figure references below.

TABLE 6-3: AREAS OF SPECIAL VISUAL/AESTHETICS CONSIDERATION ALONG RAIL CORRIDORS

Corridor	High Potential Visual Impact	Moderate Potential Visual Impact

Union Station Rail Corridor (USRC)	• Scenic, cultural or historic features/environments directly adjacent to the proposed infrastructure.
	  ○ See Figure USRC-2 and USRC-3
		• Areas where there are scenic views or scenic and natural areas that will be altered by the introduction of the proposed infrastructure.
		  ○ See Figure USRC-4

Lakeshore West (LSW)	• Areas where there are scenic views or scenic and natural areas that will be altered. ○ See Figure LSW-72 to LSW-74	• None
Kitchener (KT)	• None	• None
Barrie (BR)	• None	• None

Stouffville (ST)	• None	Unknown future proposed development, which may include:
		• Areas where high-rise buildings in a natural setting are closer than 30 metres to the ROW; and
		• Residential areas where homes are between 8 and 20 metres away from the proposed infrastructure.
		  ○ See Figure SV-33 to SV-36
		• Areas where there are scenic views or scenic and natural areas that will be altered.
		  ○ See Figure Map SV-47 to SV-50

Lakeshore East (LSE)	• None	• Areas where high-rise buildings in a natural setting are closer than 30 metres to the ROW. ○ See Figure LSE-22

6.13.2 OCS at New Layover/Storage Yard Facilities

The installation of OCS infrastructure at new Layover/Storage Yard Facilities have potential to affect views within the surrounding area, particularly where vegetation/tree clearing is required or where there are no existing obstructions.

However, in cases where a facility is proposed within the vicinity of residential/natural areas and/or other visually sensitive areas, landscaping and/or screening may be implemented around the facility. The specific location recommended as part of this EPR Addendum includes:

- Walkers Line Layover (Lakeshore West Rail Corridor, within the City of Burlington)
- Unionville Storage Yard (Stouffville Rail Corridor, within the City of Markham)
- Midland Layover (Lakeshore East Rail Corridor, within the City of Toronto)

Metrolinx will continue to engage relevant municipalities during the detailed design phase to determine the feasibility and need for visual mitigation measures for the above noted facilities.

6.14 Land Use

Refer to Section 6.3.3 and Section 6.22 outlining commitments related to Municipal permits and specific Municipal commitments.

6.15 Property

It is noted that additional electrification infrastructure (e.g., OCS pole foundations) will be contained within the same property footprint requirements identified within the New Track & Facilities TPAP and the Scarborough Junction Grade Separation TPAP. Should additional property requirements be identified, Metrolinx will proceed with property acquisition as follows (if required):

- Based on the GO Rail Network Electrification detailed design, confirm locations where temporary/permanent easements/property acquisition will be required;
- Obtain all easements/property acquisitions from public/private property owners that are required to implement the project in accordance with Metrolinx's approved property acquisition process.

6.16 EMI / EMF

An Electromagnetic Fields (EMF) and Electromagnetic Interference (EMI) Assessment was carried out as part of the Significant Addendum to the 2017 GO Rail Network Electrification EPR to document existing EMF and EMI conditions within the study area and to determine the potential effects of implementing an electrified corridor related to EMF and EMI. The results of this assessment recommended that additional studies and analyses will need to be carried out during the future phases of the project, and once the electric train specifications are known. All recommendations for mitigation and future study as identified in the EMI/EMF Assessment Report (see **Appendix J**) will be implemented.

The following section outlines the commitments Metrolinx will adhere to during future phases of the project following TPAP completion.

6.16.1 General

In terms of the prevention and mitigation of electromagnetic fields and radiation on the Project, several general strategies will be used. These strategies address the need to continue to monitor and mitigate appropriately. They apply equally across the entire corridor, and across all rolling stock. They include:

- Generation of an EMC Control Plan, to communicate the design and development strategy for EMC generally—including both ELF and EMI—and catalogue the types of electronics that will be installed.
- Verification of EMI and EMF levels generated by the rolling stock, both in passenger compartments and at trackside, including at typical station locations, using industry-standard techniques; and,
- Data review of the industry-mandated EMC reports for components used throughout the implementation and the measurements and studies conducted post-construction, to generate a final EMC Report for the project.

6.16.2 Electromagnetic Compatibility Control Plan

Metrolinx will prepare and implement Electromagnetic Compatibility (EMC) Control Plan, to communicate the design and development strategy for EMC (including both ELF and EMI) and to catalogue the types of electronics that will be installed.

For both Extremely Low Frequency (ELF) Electromagnetic Fields (EMF) and Electromagnetic Interference (EMI), industry-standard mitigation measures will be applied as well in applicable standards and references documented in the Appendix of the EMI/EMF Assessment Report (see **Appendix J**). During detailed design, further analysis and measurements will be carried once the electric rolling stock specifications are known in order to ensure EMI immunity and emissions compliance for the electrified corridor.

As per the American Public Transportation Association (APTA) Standard SS-E-010-98, the EMC Control Plan should include but not be limited to:

- Characterizes potential EMI sources and hazards to transit/rail operations;
- Considers low-cost, no-cost options, or best practices for EMI prevention, control and mitigation techniques. Examples are: posted warning signs to control access, fencing, and shielding of substations, or grade crossing access, as needed);
- Considers best practices in EMI susceptibility control procedures. Examples are: active or passive shielding, cathodic protection, surge protection, fail-safe circuit redesign, changed location of antennas or susceptible equipment, redesign of equipment, enclosures for equipment, etc.);
- Utilizes current EMC guidance and resources for transit electrification developed by EPRI, AAR and AREMA as discussed in Sec. V B EMF Modelling and Measurement Tools;
- Includes (or references) a safety analysis and failure analysis of the transit system;
- Addresses grounding or shorting hazards, prevents, controls or mitigates as needed stray currents (earth-return currents or induced currents in metallic structures and pipelines or along the return rails (where some fraction of the current finds its way back to substation or generating station through the earth for various regions and soil conditions), and the effects of different design and construction practices on these currents; (This list of frequencies is a key input to the detailed, post-electrification EMI scans taken at each TPF and compared to required levels in EN 50121.);
- Characterizes the frequency bands, spectral characteristics of ELF/EMF and RF generated noise by the pantograph-catenary contact under operating conditions; and
- Characterizes along the right-of-way parameters (e.g., frequency spectrum, electric and magnetic field strengths, modulation system) for the wireless communications, control, and power and

propulsion system (including auxiliary power for HVAC, emergency lighting and signage, public address, etc.).

The EMC Control Plan will include provisions for: immunization of freight track circuits and grade crossings as well as immunization of compatible track circuits, impedance bonds as well as bonding and grounding for currents.

6.16.3 Frequency Management Plan

A frequency management plan will be developed and implemented by Metrolinx during the detailed design phase. This plan is needed to capture the operating frequencies at the system engineering level from all intentional radiators in the vicinity of the railway.

6.16.4 Construction Phase

Ensure compliance with requirements as outlined in *EN 50121, IEEE C63.12, AREMA Signalling and Control Manual 11.5.2, IEC 61000* and other relevant EMC standards by product manufacturers. The manufacturers will be required to provide compliance test results and supporting documentation to Metrolinx during the project construction phase.

6.16.5 Commission Phase

During the electrification commissioning phase, overall ELF and RF emissions emanating from the electrified railway corridor (including emissions from all the electrified tracks, OCS, and EMU trains) will be field tested and verified to ensure EMFs are within the limits of applicable industry standards.

6.16.6 Operations/Maintenance Phase

Undertake testing and maintenance procedures in order to mitigate EMI to track circuits and increase personnel safety due to EMI induced common mode voltage.

6.16.7 EMF Exposure Reduction

As per FTA Best Practices for EMF concerns, particularly ELF EMF, the only relevant Best Practice is:

> *Conduct baseline measurements before and after transit system construction and operation. EMF and EMR measurement surveys along the right---of-way and of locations where TPSS, inverters, 3rd rail, and OCS would be placed are recommended. If measurements are too costly, EMF and EMR data on similar transit systems and urban environments can be used, in combination with M&S tools, to predict environmental EMF levels as a function of distance from the right-of-way. The objective is to compare the pre-existing "before" background EMF levels, with expected "after" construction EMF. This allows the determination of incremental EMF contributions from the planned electric transit system.*
>
> *Data will also permit identification of potential EMF or RF "hotspots" in publicly accessible areas (stations, streets, near utility substations, in vehicle) that might require mitigation.*

As previously noted, baseline measurements are complete, and higher-than-background areas—to be re-assessed post-electrification, if any, have been identified and cataloged in the EMI/EMF Baseline Conditions Report. Any additional locations that were identified during Impact Assessment, are listed in this report.

As per Health and Safety Executive HSE281, "Guide to the Control of Electromagnetic Field at Work Regulations (CEMFAW) 2016," the recommended Best Practice includes a direct assessment of Action Levels (ALs) and Exposure Limit Values (ELVs). This recommendation is identical to the measurements made as part of this EA and as described in the FTA Best Practices document referenced above. As well, the ALs and ELVs listed in HSE281 are based upon the same recommendations of the International Commission on Non-Ionizing Radiation Protection (ICNIRP) as have been referenced throughout this

report. Specifically, HSE281 states, with regard to the CEMFAW Regulations, that an employer is required to:

- Assess the levels of EMFs to which your employees may be exposed;
- Ensure that exposure is below a set of ELVs;
- When appropriate, devise and implement an action plan to ensure compliance with the exposure limits;
- When appropriate, assess the risks of employees' exposure and eliminate or minimize those risks. You must make sure you take employees at particular risk, such as expectant mothers and workers with active or passive implanted or body-worn medical devices, into account.
- Provide information and training on the particular risks (if any) posed to employees by EMFs in the workplace and details of any action you are taking to remove or control them. This information should also be made available to their safety representatives, as appropriate;
- Take action if employees are exposed to EMFs in excess of the ELVs; and
- Provide health surveillance or medical examination, as appropriate.

As previously noted, and shown in the Monitoring and Commitments section of the relevant reports, these steps are being taken, particularly with regard to the assessment of EMF levels and mitigation, if needed.

6.17 Utilities

6.17.1 General

It will be necessary to finalize the site servicing plans beyond their current conceptual level of detail prior to construction to improve the completeness and accuracy of utility information; specifically, the extent of actual utility conflict(s). This is because the records for underground assets that were reviewed in developing the conceptual designs were classified as Quality Level 'D' information, meaning the cover depths for third-party utility assets were not confirmed. Until depth/clearance from the ground elevation to the utility is confirmed, the ultimate extent of conflicts cannot be determined.

Furthermore, the utilities assessment completed at the conceptual design/TPAP stage did not include a review of railway assets, which are utilities owned by Metrolinx or other railway owner, operators, or maintenance companies. Railway assets include signal cables, signal power cables, snow clearing devices, switch machines, and any other infrastructure owned by a Rail Operator (such as Metrolinx, Canadian National (CN), Bell/360, Canadian Pacific (CP), etc.). Metrolinx's Contractor will be required to identify and mitigate conflicts as required to accommodate their design.

Potential effects/conflicts with known utilities were assessed, and mitigation measures identified as appropriate as part of the EPR Addendum. There are a significant number of utilities and utility owners in the study area. As part of the EPR Addendum, these utilities were contacted regarding the potential effects due to the proposed infrastructure, however the final assessment of utility conflicts due to the proposed infrastructure will need to be evaluated at the detailed design phase. Implementation and construction obligations will be undertaken pursuant to the crossing agreements with each of the utility companies as required.

Specifically, during the detailed design phase, the exact locations and depths of utilities will be determined and the staging and relocations approach will be established in discussion with affected utility companies. The following additional work will be undertaken as appropriate:

- Continue to meet with the utility companies to determine risks, timing and the appropriate mitigation strategy to address potential conflicts
- Confirm utility relocations/protection required based on detailed design and undertake negotiations with relevant utility companies, as required.
- Based on the requirements of each utility company, utilities will be relocated or protected to allow for the electrification construction works and allow trains to pass without damage.
- Utilities affected by construction will be temporarily relocated along the roadway and railway right-of-way.
- With input from legal counsel for both contracting parties, amend existing crossing agreements or develop new crossing agreements that set out the additional cost burdens associated with deenergizing and limited operational windows as well as fines related to cable fall.
- Develop a mitigation plan with each utility that includes the appropriate contractual options to implement the appropriate mitigation strategy.
- Implement the mitigation plan through the applicable contractual parties from design through to construction.
- Monitor construction activities to ensure that works schedule is being coordinated.
- Spatial and electrical clearance conflicts may be mitigated through: removal, relocation, reconfiguration or burial of overhead utilities.
- For utilities attached to bridges, further study of the potential conflict during the design phase will be required to determine the extent of actual conflict.
- Electrical zone of influence effects may be mitigated through grounding and bonding or isolation.

The following outlines the various options for undertaking Utility relocations during the subsequent design/construction phases.

- Option 1 – Utility Early Work Contract
    - Utility design and construction are done prior to Project Co. commencing work.
- Option 2 – Request for Proposal (RFP) Agreement
    - Utility design is done by the Utility company, and Project Co. constructs with Utility supervision.
- Option 3 – Alternate Financing and Procurement (AFP) on board agreement
    - Project Co. does the design and construction (Utility company provides approvals and/or supervision)

Work undertaken as Option 1 will have limited construction impacts as the utilities will be relocated prior to the construction period. However, some pre-relocated utilities may have to be protected during construction of new tracks.

Work undertaken as Option 2 and Option 3 may have construction impacts. The utility works may occur at the same time as the construction for the proposed works discussed in this impact assessment.

The determination of which option is to be employed will be determined during detailed design.

6.17.2 Hydro One Infrastructure

No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.18 Climate Change & Sustainability

See Section 4.8.14 for a detailed discussion of mitigation measures and future commitments to address climate change and sustainability.

A Sustainability Plan shall be designed in alignment with the Environmental Management System, which will align with Metrolinx's Sustainability Strategy. Metrolinx will also implement its Winter Maintenance Plan (which will reduce salt usage and impacts), develop a Community Benefits Agreement, and develop a Construction and Demolition Waste Management Plan. These features are detailed further in Section 4.8.14.2.

6.19 Public / Stakeholder Engagement

Metrolinx will continue to engage and communicate with stakeholders beyond the completion of the Significant Addendum to the 2017 GO Rail Network Electrification EPR as follows:

- Engage with affected property owners within the study area to acquire property easements, as/if required;
- Engage with affected property owners with respect to grounding and bonding locations, as required);
- Engage with affected communities along the rail corridors with respect to next steps for determining areas where noise/vibration mitigation measures are recommended and the form/type of mitigation to be implemented;
- Design and implement a response strategy to address/resolve potential noise/vibration complaints during the construction phase, as required;
- Review options with Municipalities as required to maximize the aesthetics of project infrastructure, such as OCS infrastructure where/if possible;
- Coordinate with Municipalities to develop traffic, parking, transit, cycling and pedestrian management strategies to be included in construction contract documents, as appropriate, to avoid/minimize interference to the extent possible;
- Coordinate with Municipalities to review detailed designs affecting heritage resources/properties of interest and incorporate feedback/input into final designs, as appropriate; and
- Confirm locations of any additional contractor staging/storage areas required which may require leasing agreements with private property owners and/or affected Municipalities.

6.19.1 Engagement with Indigenous Nations and Organizations

In addition to commitments outlined in Section 6.6.5 above, Metrolinx will continue to consult with Indigenous Nations and organizations during future project phases.

6.20 Ministry of Transportation

Commitments to future works associated with permits and approvals from the Ministry of Transportation are detailed in Section 6.3.2.4. No additional commitments beyond what was identified in the 2017 GO Rail Network Electrification EPR are necessary for the additional OCS infrastructure proposed.

6.21 Municipalities

Metrolinx will continue to coordinate with municipalities as required with respect to the GO Expansion Program Vegetation Removal & Compensation Plan.

6.21.1 City of Toronto

Metrolinx will continue to consult and coordinate with the City of Toronto during the detailed design and construction phases of the project as follows:

- Metrolinx will engage the City of Toronto during construction planning to ensure that any municipal concerns are addressed in the construction plans prior to commencement of construction activities.
- Coordination with the City, as required, with respect to the additional infrastructure associated with the final design of the USRC Hydro One Conflicts.
- Coordination with the City, as required, with respect to the OCS Infrastructure associated with the final design of the Midland Layover.

6.21.2 Region of Durham

Metrolinx will continue to consult and coordinate with the Region of Durham during the detailed design and construction phases of the project as follows:

- Coordination with the Region as required for additional OCS Infrastructure associated with the Thickson Road Bridge Expansion design, to determine any impacts to Regional Roads (i.e. road and sidewalk closures, vertical clearance, etc.) and any necessary mitigation measures.

6.21.3 Region of Halton

Metrolinx will continue to consult and coordinate with the Region of Halton during the detailed design and construction phases of the project as follows:

- Coordination with the Region, as required, with respect to the OCS Infrastructure associated with the final design of the Walkers Line Layover.

6.21.4 City of Burlington

Metrolinx will continue to consult and coordinate with the City of Burlington during the detailed design and construction phases of the project as follows:

- Coordination with the City, as required, with respect to the OCS Infrastructure associated with the final design of the Walkers Line Layover.

6.21.5 City of Markham

Metrolinx will continue to consult and coordinate with the City of Markham during the detailed design and construction phases of the project as follows:

- Coordination with the City, as required, with respect to the OCS Infrastructure associated with the final design of the Unionville Storage Yard.

6.22 EPR Addendum Process

In recognition of the fact that there could be changes to the project design/description following its TPAP completion during detail design and/or construction, Metrolinx will comply with O. Reg. 231/08 for reviewing any changes to the project following completion of the TPAP or the completion of a Significant Addendum to the TPAP.

During the detailed design and/or construction phases of the Electrification project, changes to some aspects of the project may occur due to:

- Unforeseen site-specific problems encountered only during detail design and/or construction;

- Improvements in the design to provide greater environmental benefits and/or less adverse effects;
- Elements of the project that were not previously envisioned;
- Circumstances that develop at the time of construction;
- Issues identified in other approvals processes; and/or
- Changes to the regulatory framework (i.e., new legislation or regulations).

Metrolinx will therefore review any changes to the project design/description and determine whether the change constitutes either: (1) an Insignificant Change or (2) Significant Changes. The following questions may be applied to the proposed change as part of the review to determine how it should be dealt with:

- Is there a change to what was proposed to be built?
- Is there a change to where something was to be built?

Metrolinx will utilize the responses to these questions to determine how the proposed change will be dealt with. For example, in the case where a "Yes" is provided, then Metrolinx will determine the significance of that change in terms of its potential effect on the environment, a stakeholder (including the public), and/or a commitment made in the GO Rail Network Electrification EPR or this Significant Addendum herein.

6.22.1 Insignificant Changes

If the significance of the change is determined to be not significant/negligible, in accordance with O. Reg. 231/08, Metrolinx will document the rationale for this decision and keep a record of the EPR addendum/change documentation in the project file.

The EPR Addendum documentation to be kept on file will contain the following:

- A description of the change;
- Reasons for the change;
- Assessment/evaluation of potential impacts that the change may have on the environment;
- Description of any proposed mitigation measures for mitigating potential negative impacts on the environment due to the change; and
- A statement of whether the changes were deemed significant or not and the reasons for this opinion.

Following this, Metrolinx would go ahead and implement the change. A Notice of Environmental Project Report Addendum will not be required/published.

6.22.2 Significant Changes

If the significance of the change to the project is deemed to result in an increased potential adverse effect, then it would be categorized as a change that will require publishing of a Notice of EPR Addendum, as per *O. Reg. 231/08*.

An EPR Addendum will be prepared containing the following information:

- A description of the change;
- Reasons for the change;
- Assessment/evaluation of potential impacts that the change may have on the environment;

- Description of any proposed mitigation measures for mitigating potential negative impacts on the environment due to the change; and,
- A statement of whether the changes were deemed significant or not and the reasons for this opinion.