METROLINX

GO Rail Network Electrification

Transit Project Assessment Process
Environmental Project Report

October, 2017

MORRISON HERSHFIELD

Gannett Fleming

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This Revised Final Environmental Project Report – Volume 5 has been updated to reflect the specific additions/revisions outlined in the Errata to the Environmental Project Report, dated November, 2017. As such, it supersedes the previous Final version dated October, 2017.

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- **Appendix L - Consultation Record**: summarizes the consultation activities carried out by Metrolinx and Hydro One as part of the GO Rail Network Electrification TPAP 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.

- **Appendix M** – **Cultural Heritage Evaluation Reports (CHERs), Heritage Impact Assessment Reports (HIAs) and Statements of Cultural Heritage Value (SCHV):** includes copies of the CHERs, HIAs and SCHVs carried out for various heritage properties as part of the GO Rail Network Electrification TPAP.
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- **Appendix P –** P1: Mapping of Ecological Land Classification Areas and P2: Mapping of Terrestrial and Aquatic Features along each rail corridor within the GO Rail Network Electrification Study Area have been included for reference.
- **Appendix Q - Mapping of Identified Cultural Heritage Resources**. Mapping of Identified Cultural Heritage Resources within the GO Rail Network Electrification Study Area have been included for reference.
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- **Appendix S - Mapping of Noise/Vibration Receptors and Recommended Locations for Noise/Vibration Mitigation**. Mapping of Noise and Vibration Receptors that were examined in the Noise and Vibration modelling study, as well as areas where noise and vibration mitigation locations were identified along each rail corridor within the GO Rail Network Electrification Study Area have been included for reference.
- **Appendix T - Mapping of Viewsheds and Potential Visual Impact Areas**. Mapping of viewsheds and potential visual impact areas along each rail corridor within the GO Rail Network Electrification Study Area have been included for reference.
- **Appendix U** – **List of Technical Reports and Studies Reviewed**. Contains a list of the various technical reports/studies that were reviewed as part of carrying out the TPAP.
- **Appendix V – Groundwater Assessment Report**. Summarizes the results of carrying out the preliminary groundwater assessment, including potential groundwater effects and effects on wells.

Glossary of Terms

Term	Definition
230 kV Aerial Connection	Overhead electrical high voltage connection line from the existing Hydro One tap to the new traction power substation (TPS).
AAQC	The acronym for the Province of Ontario's Ambient Air Quality Criteria.
AC	Alternating Current. Alternating Current is 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.
AFP	Alternative Financing and Procurement. 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.
AG	Agriculture as defined by the Ecological Land Classification System.
ANSI	Area of Natural and Scientific Interest.
APTA	APTA stands for American Public Transportation Association.
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).
AREMA	American Railway Engineering and Maintenance-of-Way Association. AREMA is the organization that represents the engineering function of the North American railroads.
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.
Bare wires	Conductive wires which do not have insulation. These wires may be solid or stranded and are normally self-supporting.
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.
CA	Acronym for Conservation Authority.
CAAQS	Canadian Ambient Air Quality Standards.
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.
CEAA	Canadian Environmental Assessment Act.
CGL	Green Lands as defined by the Ecological Land Classification System.
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.

CHVI	Cultural Heritage Value or Interest.
Circuit	A conductor or system of conductors which form an electrical section between two switching points.
Class EA	Under the Ontario Environmental Assessment Act (EA Act), Class Environmental Assessments are those projects that are approved subject to compliance with an approved class environmental assessment process (e.g., Class EA for Minor Transmission Facilities, GO Transit Class EA, etc.) with respect to a class of undertakings.
CLOCA	Central Lake Ontario Conservation Authority.
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).
Conceptual Design	The conceptual design phase of a project is defined as the first design stage. This stage includes creating ideas and taking into account 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 Metrolinx.
Contact Wire	A solid grooved, bare aerial, overhead electrical conductor of an overhead contact system (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.
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.
COS	Contamination Overview Study.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada.
COTS	Commercial Off-the-Shelf.
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 overhead contact system (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 Resource (CHR)	Includes archaeological resources, built heritage resources and cultural heritage landscapes.
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	Cultural heritage value or interest: means the cultural heritage value or interest of a property determined in accordance with the "Criteria for Determining Cultural heritage value or interest" set out in Ontario Regulation 9/06 made under the Ontario Heritage Act or, in respect of properties of provincial significance, determined in accordance with the "Criteria for Determining Cultural Heritage Value of Provincial Significance" set out in Ontario Regulation 10/06 made under the Ontario Heritage Act and, for archaeological resources, means the cultural heritage value or interest of any archaeological resource as determined in accordance with the Standards and Guidelines for Consultant Archaeologists prepared and published by MTCS under the Ontario Heritage Act.
CUM	Cultural Meadow as defined by the Ecological Land Classification System.
CUW	Cultural Woodland as defined by the Ecological Land Classification System.
CV	Constructed Lands as defined by the Ecological Land Classification System.
CVC	Commercial and Institutional Lands as defined by the Ecological Land Classification System.
CVC Authority	Credit Valley Conservation Authority.
CVI	Transportation and Utilities as defined by the Ecological Land Classification System.
CVR	Residential Lands as defined by the Ecological Land Classification System.
Data Gap Analysis	An analysis conducted on previously available studies and research to see what information is missing in order to determine what requires further study.
dB/dBAa	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. In the A-weighted system, the decibel values of sounds at low frequencies are reduced, compared with unweighted decibels, in which no correction is made for audio frequency.
Deadhead Movements	Deadhead movements are considered to be 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.
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.
DFO	Department of Fisheries and Oceans.
Disconnect Switches	An electrical switch for disconnecting electrical power from a line section.
Distribution Line (DL)	Electrical line conveying electricity at voltages less than 50kV.
DMU	Diesel Multiple Unit; a train comprising single self -propelled diesel units.
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.
ELC	Ecological Land Classification. The system in place in Ontario for defining ecological units on the basis of bedrock, climate, physiology, and vegetation.
Electric Traction Facility	A traction substation, paralleling station, or switching station.
Electrical Potential	A measurement of the voltage (or potential difference) between two points in a system. For UP Express electrification, electrical potential is the electrical charge

	difference between the electrified UP Express railway and the ground. The unit for electrical potential is expressed in volts.
Electrical 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.
Elementary Electrical Section	The smallest section of the overhead contact system (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.
ELF	Extremely Low Frequency. ELF is 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 kilometers.
EMC	Electromagnetic Compatibility. Electromagnetic compatibility is 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.
EMF	Electric and Magnetic Field. 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.
EMI	Electromagnetic Interference. Electromagnetic interference is a disturbance that affects an electrical circuit due to either electromagnetic induction or radiation from an external source.
EMI Noise	Unwanted electrical signals that produce undesirable effects in the circuits of the control system in which they occur.
EMU	Electric Multiple Unit; a train comprising single self-propelled electric units.
END	Endangered, a designation for a Species at Risk.
EPR	Environmental Project Report. The proponent is required to prepare an Environmental Project Report to document the Transit Project Assessment Process 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.
ESA	Environmentally Significant Area. These are natural areas which are particularly significant or sensitive requiring additional protection to preserve their environmental qualities and significance.
ESA, 2007	The *Ontario Endangered Species Act, 2007*.
ESAs	Environmental Site Assessments 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.
Feeder	A current-carrying electrical connection between the overhead contact system and a traction power facility (substation, paralleling station or switching station).

Flash Plate	A flash plate is 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.
FOD	Deciduous Forest as defined by the Ecological Land Classification System.
FOM	Mixed Forest as defined by the Ecological Land Classification System.
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.
FTA	FTA stands for Federal Transit Administration, a United States federal agency.
FWCA	Fish and Wildlife Conservation Act.
Gantry	The feeder wires from the traction power substation (TPS) will be connected to the overhead contact system (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.
GIS	Geographic Information Systems. GIS systems are designed to capture, store, visualize, manipulate, analyze, manage, and present spatial or geographical data.
Greenhouse Gases	Greenhouse gases are those 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 (CO_2e), which is the total mass of CO_2 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 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.
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.
HiRail Vehicle	A road-rail vehicle which can operate both on rail tracks and a conventional road.
HRCA	Halton Region Conservation Authority.
HV	High Voltages, high voltages refers to electrical energy at voltages high enough to cause injury and harm to human beings and living species. Voltages over 1000 for alternating current, and 1500 V for direct current is considered high voltage.
Hydro One	Hydro One Incorporated 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.
ICNIRP	International Commission on Non-Ionizing Radiation Protection. The ICNIRP is an international commission specialized in non-ionizing radiation protection. ICNIRP is an independent nonprofit scientific organization chartered in Germany. It was founded in 1992 by the International Radiation Protection Association (IRPA) to which it maintains close relations.

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 in order 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.
Insulated Wires	Conductive wires which are covered in a layer of insulating material to provide protection that will increase safety and efficiency, and is used to stop the passage of electricity, heat, or sound from one conductor to another. These wires are normally supported on a weight-carrying messenger wire.
IPCC	The Intergovernmental Panel on Climate Change.
kV	Abbreviation for kilovolt (equal to 1000 volts).
LIO	Land Information Ontario.
LSRCA	Lake Simcoe Region Conservation Authority.
LV	Low Voltage, according to the International Electrotechnical Commission (IEC) voltages between 50-1000 V for alternating current, and between 120-1500 V for direct current is considered low voltage.
MA	Marsh as defined by the Ecological Land Classification System.
Main Gantry	These 25 kV feeders from the traction power facility (TPF) will be connected to the overhead contact system (OCS) with the help of main and strain gantries and a cross feeder arrangement. The main gantry also referred to as the catenary feeding gantry is the one parallel to and toward the TPF side of the track.
Maintenance Facility	A mechanical facility for the maintenance, repair, and inspection of engines and railcars.
MAM	Meadow Marsh as defined by the Ecological Land Classification System.
MAS	Shallow Marsh as defined by the Ecological Land Classification System.
MBCA	TMigratory Birds Convention Act.
MEM	Mixed Meadow as defined by the Ecological Land Classification System.
Messenger Wire	In catenary construction, the overhead contact system (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).
Mi.	The contraction of Mileage, measurement in miles along the rail corridors. This is determined by historical corridor ownership and is not consistent throughout the network.
Mid-span	Area between two overhead contact system (OCS) registration points.
Milligauss	In electricity, a practical unit of magnetic induction equal to a thousandth of one gauss or of one c. g. s. electromagnetic unit.
Minister	Ontario Minister of the Environment and Climate Change.
Mitigation Measure	Actions that remove or alleviate, to some degree, the negative effects associated with the implementation of an alternative.
MNRF	Ontario Ministry of Natural Resources and Forestry.
Modelling	The process of using collected data and information to generate rational predictions regarding the future implementation of project components.
MOECC	Ontario Ministry of the Environment and Climate Change.
MTCS	

	Ontario Ministry of Tourism, Culture, and Sport is responsible for the administration of the Ontario Heritage Act and may determine policies, priorities and programs for the conservation, protection and preservation of Ontario's heritage.
MTO	Ontario Ministry of Transportation.
MVA	Megavolt-Ampere. This is a unit for measuring the apparent power in an electrical circuit equivalent of one million watts.
NAPS	National Air Pollution Surveillance program.
Negative Feeder	Negative feeder is an overhead conductor supported on the same structure as the catenary conductors, which is at a voltage of 25 kV with respect to ground but 1800 out-of-phase with respect to the voltage on the catenary. Therefore, the voltage between the catenary conductors and the negative feeder is 50 kV nominal. The negative feeder connects successive feeding points, and is connected to one terminal of an autotransformer in the traction power facilities (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.
NEP	Niagara Escarpment Plan areas, part of the Greenbelt Plan.
Net Effect	The effect (positive or negative) associated with an alternative after the application of avoidance/mitigation/compensation/enhancement measures.
NHIC	Natural Heritage Information Centre.
NIEHS	National Institute of Environmental Health Sciences, a division of the United States National Institute of Health (NIH).
Notice of Commencement	The Proponent is required to prepare and distribute a Notice of Commencement, which "starts the clock ticking" for the 120-day portion of the transit project assessment process. Proponents must prepare and distribute a Notice of Commencement to indicate that the assessment of a transit project is proceeding under the transit project assessment process. Proponents must complete their documentation (the Environmental Project Report) of the transit project assessment process within 120 days of distributing the Notice of Commencement.
Notice of Completion	The Notice of Completion must be given within 120 days of the distribution of the Notice of Commencement (not including any "time outs" that might have been taken). The Notice of Completion of Environmental Project Report signals that the Environmental Project Report has been prepared in accordance with section 9 of the regulation and indicates that the Environmental Project Report is available for final review and comment (for 30 calendar days). Following the 30-day public review period, there is a 35-day Minister's decision period.
OA	Open Water as defined by the Ecological Land Classification System.
OAO	Open Aquatic Area
OBBA	Ontario Breeding Bird Atlas.
Ohms	Unit of electrical resistance. A low electrical resistance indicates a strong path which current can easily flow.
Ontario Heritage Act (OHA)	The Ontario Heritage Act provides the framework for provincial and municipal responsibilities and powers in the conservation of cultural heritage resources: https://www.ontario.ca/laws/statute/90o18.
OP	Municipal Official Plan.
Open Route	An area of tracks where there is no vertical conflicts to the overhead contact system (OCS).

ORMCP	Oak Ridges Moraine Conservation Plan.
ORRA	Ontario Reptile and Amphibian Atlas.
Overhead Contact System (OCS)	The acronym for the Overhead Contact Systems (OCS), which is comprised of: 1.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. 2. Portions of the traction power return system consisting of the negative feeders 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.
OWES	Ontario Wetland Evaluation System.
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 overhead contact system (OCS) voltage in the electrified system.
Particulate Matter (PM)	Microscopic solid or liquid matter suspended in the atmosphere.
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 overhead contact system (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.
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 overhead contact system (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.
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.
Polycyclic Aromatic Hydrocarbons (PAH)	A group of compounds that contain only carbon and hydrogen and are composed of multiple aromatic rings. They are released from the burning of fuels.
Portal	Portal is an overhead contact system (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. The "portal boom" provides support points for the overhead contact system (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 possible or probable effect of implementing a particular alternative.
Potential Provincial Heritage Property (PPHP)	A property which has the potential to fulfill the requirements of a Provincial Heritage Property.
Potentially Contaminating Activity (PCA)	Use or activity at a site that has the potential to result in soil and/or groundwater contamination. Examples of PCAs are set out in Table 2, Schedule D of *O.Reg. 153/04.*
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.
Proponent	A person who 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 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.
Provincial Heritage Property (PHP)	A real 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 (Standards and Guidelines for Conservation of Provincial Heritage Properties, Ontario Heritage Act).
Provincially Significant Wetland (PSW)	Wetlands deemed by the province to be ecologically significant in nature and thus protected from all development activities.
Rail Potential	The voltage between running rails and ground occurring under operating conditions when the running rails are utilized for carrying the traction return current or under fault conditions.
Receptor	Locations, structures, or facilities that have the potential to be impacted by or interact with the project.
RER	Acronym for Regional Express Rail. RER is the 10 year transit plan for the Greater Toronto Hamilton Area that is being implemented by Metrolinx. Electrification is a component of the RER plan.
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.
Resultant Flux Density	The mathematical computation from the combination of the measured X, Y, and Z readings of milligauss (mG). It could be approximated using a sum of squares of these readings and then taking the square root, but in the case of all readings shown

	in this report, the device used computed this number automatically and presented it as the Resultant Flux Density.
ROW	Right of Way, the portion of land adjacent to tracks owned by the Railway (Metrolinx, Canadian Pacific Railway (CP), Canadian National Railway (CN), etc.). Can be synonymous with rail corridor.
Running Rails	Rails that act as a running surface for the flanged wheels of a car or locomotive.
SAR	Species at Risk. These are plants or animals that are considered by the Government of Ontario to be endangered, threatened, of special concern, or extirpated.
SARA	Species at Risk Act.
SC	Species Concern, a designation for a Species at Risk.
SCADA	System Control And Data Acquisition. SCADA is a control system that controls and monitors the status of the industrial processes and devices for the electrification system. These devices may include motor operated disconnect switch, relay, meter and circuit break, of the Electrification System.
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 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 the purpose of 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	Shielding is 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 overhead contact system (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.
SHO	Open Shoreline as defined by the Ecological Land Classification System.
Signal System	The rail signal system is a combination of wayside and on board equipment and/or software to provide for the routing and safe spacing of trains or rail vehicles.
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.
Spur	A railroad track that diverges from the main track to service a specific location or industry.
Static Wire	A wire, usually installed aerially adjacent to or above the catenary conductors and negative feeders, that connects overhead contact system (OCS) supports collectively to ground or to the grounded running rails to protect people and installations in case of an electrical fault.
Strain Gantry	These 25 kV feeders from the traction power facility (TPF) will be connected to the overhead contact system (OCS) with the help of main and strain gantries and a cross feeder arrangement. The strain gantry is located within the right-of-way (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 references to geographic space that is being examined for the Metrolinx Network Electrification Environmental Assessment.
SW	Swamp as defined by the Ecological Land Classification System.
SWD	Deciduous Swamp as defined by the Ecological Land Classification System.
Switching Station (SWS)	Switching stations are traction power facilities that are required approximately mid-way between Traction Power Substations in order to split the electrical sections.
TAG	Treed Agriculture as defined by the Ecological Land Classification System.
THD	Deciduous Thicket as defined by the Ecological Land Classification System.
Third Rail	A third rail is a way of providing electric power to a railway train, through a semi-continuous rigid conductor placed alongside or between the rails of a railway track. Third rail systems are always supplied from direct current electricity as opposed to alternating current electricity.
THR	Threatened, a designation for a Species at Risk.
Top of Rail	Top of Rail is defined as the highest point in a running rail profile.
Touch/Step Potential	Touch potential is defined as the voltage between the energized object and the feet of a person in contact with the object. Step potential is defined as the voltage between the feet of a person standing near an energized grounded object.
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 • Negative feeders due to the configuration of autotransformer connections.
Traction Power Facility (TPF)	A general term to classify Traction Power Substations, Paralleling Stations, and Switching Stations.
Traction Power Substation (TPS)	Part of the power supply components of the system; it is a traction power facility (TPF) that transforms the utility supply voltage for distribution to the trains via overhead contact system (OCS).
Transmission Line (TL)	Electrical line conveying electricity at voltages more than 50kV.
Transmission Tap	The point at which electric power is 'tapped' from the existing Hydro One power source.
TRCA	Toronto and Region Conservation Authority.
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	A utility is 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.
View-shed	The area of visual influence of the project components.

Volatile Organic Compounds (VOCs)	A class of chemicals that contain carbon, hydrogen, and oxygen atoms and have high vapour pressures at room temperature, and therefore exist predominantly in the gas phase.
Wayside Power Control Cubicles (WPCs) and Signal Cases	A wayside installation that houses remote terminal unit (RTU) and dc power supply unit for motor operated disconnect switches at locations other than traction power facilities.
WOD	Woodland as defined by the Ecological Land Classification System.

Executive Summary

During the Transit Project Assessment Process (TPAP), Metrolinx and Hydro One worked with various stakeholders to discuss issues/concerns raised in relation to the design and implementation of the proposed GO Rail Network Electrification project. Recognizing that not all issues can be resolved prior to the detailed design stage, the following section summarizes Metrolinx's and Hydro One's commitments to future action during detail design, as well as future project phases.

Implementation of Mitigation Measures

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 this Final EPR Volume 3 during the detailed design, construction and operational phases of the project;
- Ensure that all mitigation measures outlined in Volume 3 of this EPR and all commitments outlined in this Volume 5 of the EPR are captured in the Design & Construction Contract Documents for implementation by Metrolinx, Hydro One, and/or the Contractor as appropriate and;
- Undertake all additional studies/work as outlined in this EPR (specifically Volumes 3 & 5) prior to implementation of the undertaking.

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 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.

Elements of the EMS may include but not be limited to:

- An Environmental Policy
- Environmental Impact Identification
- Objectives and Target Setting
- Stakeholder Consultation
- Emergency Procedures
- Environmental Management Plan
- Compliance Monitoring (and Auditing) Program

- Responsibilities and Reporting Structure
- Training requirements

Permits and Approvals

In addition to carrying out the TPAP 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.

Federal

In order to implement the project, there may be permits/approvals/agreements required from the following federal agencies/organizations:

- Canadian National Railway
- Canadian Pacific Railway
- VIA Rail
- Parks Canada
- Environment and Climate Change Canada
- Transport Canada
- NAVCanada
- Greater Toronto Airports Authority

As part of the detailed design phase, all permitting/approval requirements will be further reviewed to confirm those that will need to be obtained prior to project implementation.

Provincial

In order to implement the project, there may be permits/approvals/agreements required from the following provincial agencies/organizations:

- Ministry of the Environment and Climate Change
- Ministry of Natural Resources and Forestry
- Ministry of Tourism, Culture and Sport
- Ministry of Transportation
- Independent Electricity System Operator

- Hydro One Networks Inc.

As part of the detailed design phase, all permitting/approval requirements will be further reviewed to confirm those that will need to be obtained prior to project implementation.

Municipal

Although Metrolinx as a Provincial Agency, is not subject to municipal permits and approvals, Metrolinx policy is to adhere to the intent of the relevant permits/approvals requirements to the greatest extent possible, and to submit applications for review and information.

Metrolinx will continue to communicate and engage with local municipalities during the subsequent detailed design phase and during construction planning to ensure that any municipal concerns are addressed in the design/construction plans prior to commencement of construction activities, as follows:

- As a Crown Agency, Metrolinx is not bound by zoning by-laws passed by municipalities under s.34 of the *Planning Act* and as such does not have a requirement to apply for and obtain zoning amendments. However, Metrolinx will consult with, and have regard for, municipal planning policies with regard to specific projects (or components thereof) and will comply with municipal requests when and where reasonable and feasible;
- When developing plans for new or expanded infrastructure, Metrolinx will coordinate with municipal staff to ensure infrastructure is constructed to meet municipal requirements to the greatest extent possible;
- Submissions relating to building permits and Site Plan approvals (e.g., Traction Power Facilities) will be made in the spirit of co-operation and to provide the municipality with an opportunity to comment;
- Submissions relating to sewer discharge approvals, in accordance with the municipality;
- Submissions relating to permits for construction or occupancy within the existing road allowances;
- Permit to enter, road cut permits, and/or lane closures from local road authorities in order to perform utility removal or relocation work;
- Submissions relating to work that directly affects Regional/Municipal infrastructure (e.g., bridge or water/sewer line modifications) as well as Road Occupancy Permits for any work within a Regional Right-of-Way (ROW);
- Submissions relating to property access permits for any temporary or permanent access to a Regional road;
- Submissions relating to municipal heritage permits for alterations to cultural heritage resources and landscapes;
- Submissions relating to municipal Natural Feature Protection By-laws, Private Tree By-Laws, Street Tree By-Laws, and Parks By-Laws (as applicable);

- Compliance with municipal by-laws and obtain permits for all proposed tree removals on private property (in addition to approval/permission from the property owner). Metrolinx does not require permits for tree removals on their property;
- Any new works within 60 m of an existing TTC structure or other applicable transit stations will require formal submissions, coordination meetings.

Municipal Noise By-laws

The majority of municipalities within the study area have their own applicable noise guidelines (which provide sound limits) that are usually found within their noise control bylaws. As the corridor spans multiple municipalities, each municipality will need to be identified and investigated by the Contractor for the applicable by-laws.

Although provincial agencies such as Metrolinx and Hydro One are not subject to municipal by-laws, Metrolinx (and it's Contractor) will endeavour to adhere to these local by-laws as a best practice, where practical. As part of the electrification construction activities, nighttime work may be required. Although Metrolinx is exempt from municipal noise control by-laws that place limits on the timing of construction activity, Metrolinx (and their Contractor) will strive to adhere to such by-laws by limiting nighttime noisy activities wherever practical.

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.

Conservation Authorities

As a Crown Agency, 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. Notwithstanding this, wherever possible, Metrolinx will engage Conservation Authorities on specific projects (or components thereof) and will adhere to requirements when and where possible and feasible on aspects such as:

- Tree protection and removal/injury;
- Sewer discharge;
- Requirements for work/activities (e.g., excavated material removal) within the limits of Regulated Areas as defined under the Conservation Authorities Act.

In addition, Metrolinx will engage Conservation Authorities post TPAP, as appropriate, in relation to finalizing the Tree/Vegetation Compensation Protocol.

Bridge Modifications

There are numerous overhead (OH) bridges (i.e., roadway, pedestrian walkway, or railroad traffic over GO rail corridors) and rail overpass bridges (i.e., bridges carrying GO rail corridors to over roadways, pedestrian tunnels, or waterways) along the rail corridors to be electrified. While there are some structures that will not require any type of modification to facilitate electrification, there are several that will require one or more modifications as follows:

- Overhead Contact System (OCS) Attachments
- Bridge Protection Barriers
- Modifications to Achieve Minimum Clearance
- Grounding and Bonding

The recommendations for modifications included in this Environmental Project Report (EPR) are based on preliminary conceptual level engineering analysis. Therefore, during detailed design, the type of modification for each bridge and rail overpass will be confirmed.

Dunn, Dufferin, Dowling, Jameson Bridges

The detailed assessment of potential environmental impacts and public/stakeholder consultation related to the replacements of Dunn Ave. Bridge, Dufferin Ave. Bridge, Jameson Ave. Bridge, Dowling Ave. Pedestrian Bridge on the Lakeshore West corridor will be carried out as part of an EPR Addendum process to the GO Rail Network Electrification TPAP (once approved), based on the preparation of a more detailed level of design. The City of Toronto and Toronto Transit Commission (TTC) will be engaged as appropriate in the Addendum process.

Grounding and Bonding

Grounding and bonding will be installed within 4 meters of the track; notwithstanding this, an evaluation out to 10m of the track will be undertaken during detailed design to confirm whether anything else in the vicinity will require grounding.

In addition, the following review process will be carried out during detailed to mitigate any identified effects to property owners due to grounding and bonding installation:

- A case by case analysis of any non-Metrolinx owned properties that may be affected by grounding and bonding installation with the rail Right-of-Way will be undertaken;
- Engage potentially affected property owners, where required.

Freight Operations/VIA Rail

Electrification of the GO Rail Network will entail certain modifications to the operations/maintenance practices of freight operators (Canadian National Railway, Canadian Pacific Railway) and VIA Rail which may include immunization of track circuits and grade crossings, impedance bonds as well as bonding & grounding. 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.

Cultural Heritage Resources

The following general commitments related to cultural heritage will be adhered to:

- Implement all mitigation measures outlined in EPR Volume 3 and EPR Appendix C – Cultural Heritage Impact Assessment Report.
- Staging areas should be selected so that they are non-invasive and avoid heritage attributes;

- Pre-construction vibration studies should be carried out (if needed).
- Post-construction landscape treatments carried out to restore pre-construction conditions.
- Undertake any additional HIAs as required.
- HIAs will be reviewed by the Metrolinx Heritage Committee and developed in consultation with relevant municipalities.
- Metrolinx will be responsible for developing a Strategic Conservation Plan. For Provincially Significant properties, MTCS approval will be obtained for any modifications to these structures/properties prior to construction.
- If there is a change in project design post TPAP that causes any additional heritage properties to be impacted by electrification above and beyond those described in this EPR, additional impact assessment work and heritage studies will be undertaken in accordance with applicable federal/provincial legislation.
- Ensure the recommendations of the Union Station Trainshed HIA, Credit River Bridge HIA, Aurora GO Station HIA are implemented and incorporated into the Final designs.

Easement Agreement and Collateral Agreement – Union Station

Metrolinx will follow the May 1 2006 Collateral Agreement between Parks Canada, City of Toronto, and GO Transit (Metrolinx) for the Union Station Complex The Metrolinx Heritage Committee declared Union a Metrolinx Heritage Property of Provincial Significance on March 29, 2016. Therefore, the Union Station Conservation Plan will be updated accordingly and will be adhered to for all electrification modifications required within the Union Station Trainshed.

Additional Affected Heritage Resources

For any additional potentially affected resources not previously identified through the TPAP process and documented in this EPR, the following process will be adhered to:

- Carry out a Cultural Heritage Evaluation Recommendation Report (CHER) to identify heritage value and attributes;
- If found to have cultural heritage value by the Metrolinx Heritage Committee, conduct a Heritage Impact Assessment (HIA) during detail design to identify potential impacts and appropriate mitigation measures and incorporate mitigation measures into the final design.;
- Follow Metrolinx Interim Cultural Heritage Management Process (2013), for managing heritage assets;
- For any properties determined by the Metrolinx Heritage Committee to be of provincial heritage value, Metrolinx will include the property on the list of Provincial heritage properties maintained by the MTCS and will provide all related documents (e.g., CHERs, etc.) as appropriate to MTCS.

Archaeological Studies/Commitments

The following general archaeological mitigation measures will be adhere to and implemented:

- Implement all mitigation measures outlined in EPR Volume 3.
- Should changes to the project design include lands that extend beyond the limits of the corridor Vegetation Removal Zone and/or associated power supply and traction facilities as defined in the "Stage 1 Archeological Assessment Report" (ASI, July 2016) (see Appendix D), then further Stage 1 archaeological assessment studies must be conducted to determine the archaeological potential of the affected lands.

Barrie Corridor Specific Requirements

In addition, should any previously undocumented archaeological resources be uncovered along the Barrie Corridor during construction, Indigenous communities shall be notified in association with the following treaties:

- Toronto Purchase (Mississaugas of The New Credit),
- Williams Treaties (clause 2) (Alderville, Curve Lake, Hiawatha, Scugog Island, Beausoleil, Georgina Island, Rama), and
- Chippewa Treaty #18 of 1818 (Beausoleil, Georgina Island, Rama).

Engagement with Indigenous Communities

Metrolinx will engage with Indigenous communities where possible when assessing the cultural heritage value or interest of specific site types (or presence of human remains) during Archaeological Assessments (e.g., Stage 2 and/or Stage 3 Archaeological Assessments), in accordance with the document *Engaging Aboriginal Communities in Archaeology: A Draft Technical Bulletin for Consultant Archaeologists*, Section 1.

Stage 2 Archaeological Studies

Stage 2 Archaeological Assessment Studies will be undertaken prior to construction as detailed in the Stage 1 Archaeological Assessment Report contained in Appendix D.

Stage 3 & 4 Archaeological Studies

Based on the results of the completed Stage 2 archaeological assessments, Stage 3 and/or 4 archaeological assessments will be carried out as required.

Tree Inventories

During detailed design, Metrolinx will carry out detailed tree inventories/surveys for trees located outside of MX's rail ROW/property that will identify tree metrics in accordance with municipal permitting requirements. Reports will be prepared that will contain a plan which visually displays the information presented in the tree inventory, including other relevant information within the report including tree numbers.

Tree Protection

Detailed measures to protect retained adjacent trees will be implemented during construction. This will include establishing tree protection zone limits, compliance with any applicable municipal requirements,

diagram of tree protection barrier type, tree protection measures, and construction storage and staging areas where information is available.

Implementation of Tree/Vegetation Compensation Protocol

As part of the TPAP, Metrolinx developed an initial approach to tree/vegetation compensation measures to offset the tree/vegetation removals that will be required as part of the Electrification undertaking and to support a sustainable and vibrant tree canopy across the region.

More broadly, Metrolinx consulted with Conservation Authorities and Municipalities to establish a Metrolinx Tree/Vegetation Compensation Protocol; this consultation will continue beyond TPAP completion to finalise the protocol, as appropriate. Once the protocol is finalized, it will be included in the Contract documents and implemented during detailed design/construction. The following outlines the draft elements of the Protocol that have been developed to date:

- ***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 will be to reduce administrative permitting burden for trees along long stretches of rail corridor.*
- ***For Trees within Metrolinx Owned Property****: Metrolinx will develop 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 consult with Conservation Authorities and municipalities to develop the final compensation plan.*
- ***Conservation Authority Lands:*** *For vegetation removals within conservation authority (CA) lands, applicable removal and restoration requirements will be followed where applicable/required.*
    - Within CA owned land, Metrolinx will follow CA compensation requirements.
    - For CA regulated lands that Metrolinx owns, the Metrolinx Tree/Vegetation Compensation strategy will apply.
    - For CA regulated lands that Metrolinx does not own, then applicable law will apply regarding permitting requirements, etc.
- ***Federal Lands:*** *For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements will be followed.*
- ***Tree End-Use:*** *Metrolinx will develop options for the end use of trees removed from Metrolinx property e.g., reuse/recycling options.*

Contaminated Soil/Groundwater

The following commitments will be adhered to and implemented at all Tap and TPF sites (including ancillary components such as access roads, gantries, etc.) and along rail corridors:

- 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).

- Remediation and/or implementation of management measures to address contaminated soils and/or groundwater during construction and long term operations and maintenance if required/applicable. Management measures will be carried out in accordance with applicable environmental legislation.
- Implement a site specific health and safety plan for construction workers based on the findings of the subsurface investigations.
- Develop and implement an Excess Materials Management Plan based on the findings of the limited subsurface investigations. The Plan will be available on site during construction.

Rail Corridors

Additional Environmental Site Assessment studies including Phase I ESAs, Phase II ESAs, etc. will be carried out by Metrolinx as required along the corridors/OCS Impact Zone during the detailed design phase with respect to rail corridors to be electrified.

Tap Locations

Excess soil and ground water generated at the Tap sites will be analyzed for contaminants and will be disposed of in accordance with applicable legislation (i.e., *Ontario Environmental Protection Act Regulation 347*).

Traction Power Facilities

If any properties are to be acquired by Metrolinx, Phase I Environmental Site Assessments (ESAs) are recommended for due diligence purposes prior to acquisition of the sites. Depending on the findings of the Phase I ESAs, further assessment (e.g., Phase II ESA(s)) may be required prior to acquisition.

Stormwater Management (Taps/Traction Power Facilities)

The following additional studies/work/commitments will be carried out and adhered to during detailed design with respect to stormwater management (SWM):

- During detailed design, a more detailed Stormwater Management Plan and Design will be carried out and implemented by Metrolinx in accordance with the Ministry of the Environment's Stormwater Management Planning and Design Manual (2003) and will address: quantity control, erosion control, and quality control:
    - A more detailed analysis for the quantity, quality, erosion control and water balance will be required at detailed design stage.
    - The proposed development areas for each Tap and Traction Power Facility and their locations used in the preliminary SWM assessment as documented in Volume 3 were based on conceptual design; therefore reassessment of the drainage areas will be required at the subsequent detailed design stage.

Operational Noise – Train Service

In accordance with the GO Rail Network Electrification Noise and Vibration Modelling Reports contained in Appendix G and , Metrolinx will consider implementing mitigation measures to reduce or mitigate noise levels along the corridors and at Traction Power Facilities.

In accordance with the MOEE/GO Transit Noise Protocol, Metrolinx will adhere to the following commitments:

- Consider mitigation if the project is expected to cause a 5 dB increase or greater in the average noise (referred to as "Leq") relative to the existing noise level or the MOE objectives of 55 dBA for daytime and 50 dBA for night-time
- Undertake further analysis of noise mitigation options during detailed design to establish what types of mitigation will be implemented and where. This will include further consideration of the administrative, operational, economic and technical feasibility as per the Protocol.
- Mitigation should be implemented where technically feasible. At the Detailed Design phase, other considerations, such as engineering, economic and administrative feasibility should be evaluated.
- Implement noise mitigation if the measures are determined to be administratively, operationally, economically and technically feasible in accordance with the Protocol.
- If deemed feasible, the mitigation measures shall ensure that the predicted sound level from the GO Transit rail project is as close to, or lower than, the rail service objective.

Future Public Consultation

Metrolinx will carry out additional public engagement, as appropriate, regarding proposed noise mitigation solutions once detailed design has progressed.

Retained Barriers

During detailed design, noise barriers identified as technically feasible as well as retained noise barriers will be further reviewed to determine the administrative, operational, economic and technical feasibility and to further define what type of mitigation will be implemented (if applicable).

Construction Noise

When possible, construction should be limited to the time periods allowed by the locally applicable bylaws (generally during the daytime hours and during weekdays). Certain type 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. As part of the electrification construction activities, nighttime work may be required. Although Metrolinx is exempt from municipal noise control bylaws that place limits on the timing of construction activity, Metrolinx (and their Contractor) will strive to adhere to such bylaws by limiting nighttime noisy activities wherever practical.

Operational Vibration – Train Service

The vibration assessment undertaken as part of the TPAP focused on the change between the existing vibration levels and the future vibration levels, as per the MOEE/GO Transit Draft Protocol for Noise and Vibration Assessment. The subsections that follow outline which locations along each rail corridor where vibration mitigation will be considered.

In addition to the corridor specific vibration mitigation measure and commitments outlined below, the following general commitments will be adhered to as it relates to mitigating operational vibration impacts:

- The vibration assessment will be reviewed and updated during detailed design, including carrying out existing vibration measurements along the corridors for new infrastructure at relevant representative locations and a reasonable number of additional reasonable representative receptor locations to validate the need for vibration mitigation measures.
- The vibration assessment will be reviewed and updated during detailed design to identify alternative options for mitigation vibration and a preferred form of vibration mitigation will be identified including rationale for why it is preferred. The preferred mitigation will be implemented.

Visual/Aesthetics

Taps/Traction Power Facilities

The installation of Taps/Traction Power Facilities have potential to affect views within the surrounding area, particularly where vegetation/tree clearing is required or where there are no existing obstructions. Many Taps and TPFs are expected to have minimal to negligible effects on visual landscapes since they are located in industrial areas. However in cases where a facility is proposed within the vicinity of residential/sensitive areas and/or other visually sensitive areas, landscaping and/or screening will be implemented around the facility. These specific locations include:

- Maple PS (vicinity of Barrie corridor)
- Gilford PS (vicinity of Barrie rail corridor)
- Newmarket SWS (vicinity of Barrie rail corridor)
- Scarborough TPS (vicinity of Stouffville corridor)
- Scarborough SWS (vicinity of Lakeshore East corridor)
- Don Yard PS (vicinity of Lakeshore East corridor)

OCS Infrastructure

The installation of OCS infrastructure will affect the viewshed along the rail corridors, particularly in areas of vegetation/tree clearing. Therefore, 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 will be identified and specific design measures will be incorporated to mitigate visual impacts of OCS.

Bridge Barriers

All overhead and pedestrian bridges will require bridge barriers for safety, which may affect views across the bridge. Therefore, during detailed design Metrolinx will determine the preferred bridge barrier designs; as part of this, barrier designs that maintain existing views will be considered and implemented where possible. In addition, a design excellence process will review options for design treatments/options for enhancing the aesthetics of bridge barriers in consultation with interested/affected municipalities as appropriate.

GO Stations

At GO Stations, the electrification system should be designed to be as unobtrusive as possible, and where appropriate to fit, in terms of aesthetics and colour, with other Metrolinx infrastructure.

Electromagnetic Compatibility Control Plan

Metrolinx will prepare and implement Electromagnetic Compatibility (EMC) Control Plan, to communicate the design and development strategy for EMC general (including both ELF and EMI) and to catalogue the types of electronics that will be installed.

Public/Stakeholder Engagement

Metrolinx will continue to engage and communicate with stakeholders beyond TPAP completion as follows:

- Engage with affected property owners within GO Rail Network Electrification 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 is 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;
- Maintain the Electrification project website throughout the detailed design and construction phases where the public can access updated information on the project;
- Ongoing discussions/consultation with neighboring freight companies during detail design, as appropriate.

Municipal Commitments

The following commitments will be followed by Metrolinx during detailed design and construction:

- Carry out future discussions and negotiations with Municipalities in relation to alterations/modifications required on Municipal-owned or Jointly-owned bridges/rail overpasses to accommodate electrification;

- Review options with Municipalities as required to maximize the aesthetics of project infrastructure such as bridge barriers;
- Develop traffic, parking, transit, cycling and pedestrian management strategies to be included in construction contract documents in coordination with Municipalities, as appropriate, to avoid/minimize interference to the extent possible;
- Confirm locations of any additional contractor staging/storage areas required which may require leasing agreements with private property owners and/or the Municipality;
- Metrolinx will engage Municipalities during construction planning/scheduling to ensure that any municipal concerns are addressed in the construction plans prior to commencement of construction activities;
- Metrolinx will continue to coordinate with municipalities during detailed design on land use planning and design (e.g., visual/aesthetics) matters;
- Coordination with regard to municipal bridge design, bridge evaluations to determine feasibility of installing protection barriers, extent and type of bridge rehabilitation, and the verification of bridge types, will be undertaken as required during the detailed design phase;
- Metrolinx will engage Municipalities post TPAP, as appropriate, in relation to finalizing the Tree/Vegetation Compensation Protocol.

City of Toronto

Metrolinx will continue to consult and coordinate with the City of Toronto during the detailed design /construction phases as follows:

- Carry out future discussions and negotiations with City of Toronto in relation to alterations/modifications required on City/Jointly-owned bridges/rail overpasses to accommodate electrification;
- Review options to maximize the aesthetics of project infrastructure such as bridge barriers.
- Coordinate with Heritage Preservation Services at the City of Toronto to review detailed designs affecting City heritage resources/properties of interest and incorporate feedback/input into final designs as appropriate;
- Develop traffic, parking, transit, cycling and pedestrian management strategies to be included in construction contract documents in coordination with the City/TTC, as appropriate, to avoid/minimize interference to the extent possible;
- Confirm locations of any additional contractor staging/storage areas required which may require leasing agreements with private property owners and/or the City;
- 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 City bridge design, bridge evaluation to determine feasibility of installing protection barriers, extent and type of bridge rehabilitation, and the verification of bridge types, will be undertaken during the detailed design phase;
- Where bridge replacements may be required, work with the City to satisfy Environmental Assessment Act requirements for determining preferred bridge design options and assessing environmental impacts/mitigation measures;
- Coordination with the City as required with respect to final design of the Don Yard PS and other TPF locations as appropriate;
- For new infrastructure requiring new municipal water and sewer, ensure coordination with the City;
- If required by City of Toronto, an *Infrastructure Matrix Table* will be provided during detailed design stage once further details regarding utility conflicts, proposed mitigation, etc. are known;
- In the future, detailed collaboration with City staff will be required for the entire USRC (Union station inclusive) between Bathurst St. and the Don River.

TPAP Addendums

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 (and Hydro One where applicable) will comply with O. Reg. 231/08 for reviewing any changes to the project following completion of the TPAP.

Commitments and Future Work

During the Transit Project Assessment Process (TPAP), Metrolinx and Hydro One worked with various stakeholders to discuss issues/concerns raised in relation to the design and implementation of the proposed GO Rail Network Electrification project. Recognizing that not all issues can be resolved prior to the detailed design stage, the following section summarizes Metrolinx's and Hydro One's commitments to future action during detail design, as well as future project phases.

1 Implementation of Mitigation Measures

This section is to be read in conjunction with Volume 3 of this Environmental Project Report (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 this Final EPR Volume 3 during the detailed design, construction and operational phases of the project;
- Ensure that all mitigation measures outlined in Volume 3 of this EPR and all commitments outlined in this Volume 5 of the EPR are captured in the Design & Construction Contract Documents for implementation by Metrolinx, Hydro One, and/or the Contractor as appropriate and;
- Undertake all additional studies/work as outlined in this EPR (specifically Volumes 3 & 5) prior to implementation of the undertaking.

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 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.

Elements of the EMS may include but not be limited to:

- An Environmental Policy
- Environmental Impact Identification
- Objectives and Target Setting
- Stakeholder Consultation
- Emergency Procedures
- Environmental Management Plan
- Compliance Monitoring (and Auditing) Program
- Responsibilities and Reporting Structure
- Training requirements

3 Permits and Approvals

In addition to carrying out the TPAP 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.

3.1 Federal

3.1.1 Canadian National Railway

Based on the current conceptual design, a preliminary assessment of areas where Overhead Contact System (OCS) structures may be required to span over non-electrified freight-owned tracks (i.e., where there is not enough space between the freight tracks and GO tracks to place an OCS foundation) was carried out and the following areas were identified:

- Lakeshore East Corridor – GO Sub. South track starting at Oshawa GO Station heading west – mile 303.3 to 304.5– CN tracks on the south side.
- Bramalea 2X25kV Feeder Route - an agreement with the CN will be required in order to implement/operate the feeder route along the rail corridor right-of-way.

An agreement or easement from CN will be required in order to implement the feeder route as part of detailed design/implementation.

In addition, the following bridges will require modifications part of electrification:

CN York Sub (Mile 51.10 over Uxbridge Sub) – Stouffville Corridor

- Attach flash plate
- Attach bridge protection barrier

CN York Sub (Mile 0.35) – Lakeshore East Corridor

- Attach bridge protection barrier

Electrification of the GO Network will entail certain modifications to the operations/maintenance practices of CNR (as outlined in further detail in Volume 1). As a result, Metrolinx will continue to coordinate and consult with CN, as appropriate during detailed design where there are interfaces with freight territory.

3.1.2 Canadian Pacific Railway

Electrification of the GO Network will entail certain modifications to the operations/maintenance practices of CPR (as outlined in further detail in Volume 1).

In addition, the following bridge will require modifications part of electrification:

CP Belleville Sub (Mile 56.00) – Stouffville Corridor

- Attach OCS wires
- Attach bridge protection barrier

It is noted that Metrolinx is entering into a Cooperation Agreement with CP with respect to the Metrolinx electrification project. This Agreement will cover operating restrictions. Metrolinx will continue to coordinate and consult with CP, as appropriate during detailed design where there are interfaces with freight territory.

3.1.3 VIA Rail

Electrification of the GO Network will entail certain modifications to the operations/maintenance practices of VIA Rail (as outlined in further detail in Volume 1). Metrolinx will continue to coordinate and consult with VIA, as appropriate during detailed design where there are interfaces with VIA territory.

3.1.4 Parks Canada – Union Station

Metrolinx will follow the May 1 2006 Collateral Agreement between Parks Canada, City of Toronto, and GO Transit (Metrolinx) for the Union Station Complex. For any Alterations to Heritage Elements for the Electrification project, Metrolinx will consult with Parks Canada (and City of Toronto Heritage Preservation Services, when applicable) under the process in Appendix E2 Approval Process for Alterations to GO Property in the Collateral Agreement.

As per the collateral agreement:

- The **Easement Agreement** was signed with Parks Canada when Toronto and GO purchased Union Station in 2000 from Toronto Terminal Railway (TTR).
    - The Easement Agreement is meant to protect the Heritage Elements of the Station Complex.

3.1.5 Parks Canada – Rouge National Urban Park

The following commitments will be adhered to as part of future project phases (i.e., detailed design, construction) with respect to areas of the Stouffville and Lakeshore East GO rail corridors that traverse through the Rouge National Urban Park (RNUP) limits.

- During detailed design, efforts will be made to minimize visual effects of the Overhead Contact System (OCS) infrastructure as much as possible within RNUP. Visual impact mitigation strategies for OCS will be identified and incorporated into the final 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 will be identified and specific design measures will be incorporated to mitigate visual impacts of OCS. Best design practices will be followed for designing OCS in order to minimize visual impacts as much as possible particularly in areas around RNUP.

- Undertake ongoing consultation with Parks Canada regarding effects and mitigation relating to Rouge National Urban Park (e.g., cultural landscape/visual effects, natural environment, noise mitigation) as part of detailed design.

- The extent of vegetation removal will be confirmed during detail design. Further consultation and coordination with Parks Canada for any proposed tree/vegetation removals beyond Metrolinx property/on Parks Canada land (if applicable) will be undertaken during detailed design and any required approvals will be obtained from Parks Canada. Metrolinx will also consult with Parks Canada regarding requirements for vegetation management plans affecting Parks Canada land as/if appropriate.

- The "Rouge National Urban Park Best Management Practices for Tree Removal, Trimming, or Planting" will be considered and incorporated into the final electrification design/construction plans to the extent possible as part of detailed design.

- A meeting/briefing with Parks Canada Resource Conservation staff must precede any tree removal/pruning activities.

- The Butternut tree is protected under the federal Species at Risk Act (SARA). The presence/absence of Butternuts will be confirmed during detailed tree inventories completed as part of Detail Design. Should any Butternuts be found during tree inventories, appropriate approvals under SARA will be obtained. Parks Canada will also be notified in the event any Butternut trees are identified within Rouge National Urban Park.

- A Cultural Heritage Resource Impact Assessment for Rouge National Urban Park will likely need to be completed during detailed design; this requirement will be confirmed through further consultation with Parks Canada during detailed design. Typically this assessment is completed by Parks Canada with participation/input from the project proponent (e.g., Metrolinx) and with involvement of a Licensed Archaeologist.

3.1.6 Parks Canada - Environmental Impact Analysis Process

A review of the *Guide to the Parks Canada Environmental Impact Analysis Process, June 2015* document was undertaken as part of the TPAP. It is understood that Parks Canada has specific obligations under the *Canadian Environmental Assessment Act (CEAA) 2012* to ensure that no project on the lands and waters it manages is authorized unless a determination is made that the project does not have the potential to result in significant adverse environmental effects.

Based on review of the Environmental Impact Assessment (EIA) Decision Framework, it is understood that there are approved alternative planning and permitting processes that can exempt the requirement for the preparation of an EIA. The Parks Canada EIA process is the mechanism for meeting impact assessment requirements pertaining to federal land as per *s. 67 of CEAA 2012*.

The GO Rail Network Electrification Project is following the prescribed requirements under *Ontario Regulation 231/08 Transit Projects and Metrolinx Undertakings* under the *Ontario Environmental Assessment Act*. Specifically under Section 9 of this Regulation, the Proponent is required to prepare an Environmental Project Report (EPR) which includes but not exclusive to the following:

1. A statement of the purpose of the transit project and a summary of background information relating to the transit project.
2. The final description of the transit project, including a description of the preferred method of carrying out the transit project, and a description of the other methods that were considered.
3. A map showing the site of the transit project.
4. A description of the local environmental conditions at the site of the transit project.
5. A description of all studies undertaken in relation to the transit project, including,
   i. a summary of all data collected or reviewed, and
   ii. a summary of all results and conclusions.
6. The proponent's assessment and evaluation of the impacts that the preferred method of carrying out the transit project and other methods might have on the environment, and the proponent's criteria for assessment and evaluation of those impacts.
7. A description of any measures proposed by the proponent for mitigating any negative impacts that the preferred method of carrying out the transit project might have on the environment.
8. If mitigation measures are proposed under paragraph 7, a description of the means the proponent proposes to use to monitor or verify their effectiveness.

The EPR and corresponding detailed environmental studies/impact assessment reports (contained in EA Appendices A through V to the EPR) and associated commitments to mitigation measures/plans (including Vegetation/Tree Compensation to offset tree removals) as documented in this Volume 5 sufficiently demonstrate that the project is not anticipated to result in significant adverse environmental effects given

the mitigation measures recommended for implementation. As such, an EIA was not deemed warranted at the time of writing this EPR, however the requirement for completion of an EIA will be further reviewed and confirmed during detail design in consultation with Parks Canada.

3.1.7 Canadian Environmental Assessment Act

In 2012, the Canadian Environmental Assessment Act (CEAA) was amended in order to streamline the types of projects which required federal review and approval. This new process referred to as *CEAA 2012* focuses on 'potential adverse environmental effects that are within federal jurisdiction'.

Proponents must review the regulations in order to determine if their projects satisfy the one of the triggers of CEAA 2012. Should a trigger be met, a Project Description must be provided to the Canadian Environmental Assessment Agency outlining how the project will likely require a federal environmental assessment.

CEAA 2012, specifically the *Regulations Designating Physical Activities (the Regulations)*, was reviewed in the context of the GO Rail Network Electrification TPAP and it was determined that there were no triggers that applied. Notwithstanding this, the CEA Agency was notified and kept informed throughout the TPAP and were also provided with a copy of the Draft EPR and Appendices for review in January 2017 (see Volume 4 for further detail). As part of correspondence with the CEA Agency during their review of the Draft EPR, the following information was provided:

Designated Physical Activity Per CEAA 2012	Included in Scope of GO Rail Network Electrification Project? (Yes/No)
Construction, operation, decommissioning or abandonment of a new railway line in a wildlife area or migratory bird sanctuary	No
Construction, operation, decommissioning or abandonment of a new railway line that requires a total of 32km or more of new right of way	No
Construction, operation, decommissioning or abandonment of a new railway yard with seven or more yard tracks or ta total track length of 20 km or more	No
Construction, operation, decommissioning or abandonment of a new railway line designated for trains that have an average speed of 200km/h or more	No

Should any changes to the proposed project works be made during detailed design, further review of the CEAA 2012 triggers will be reviewed to confirm that there are no applicable CEAA 2012 triggers.

3.1.8 Environment and Climate Change Canada

The 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.

3.1.9 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.

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 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, through, or across scheduled navigable waterways.

There are two bridges that span scheduled navigable waterways which will be modified to accommodate rail corridor electrification. These bridges span: the Humber River (near The Queensway and South Kingsway, Toronto); the Holland River (near Bridge St. and Toll Road in Bradford-West Gwillimbury) The types of modifications required to these structures will be finalized during detailed design, however it is noted that the modifications (e.g., attachment of OCS portal structures/wires) are not expected to affect the navigability of the scheduled waterways. The Navigation Protection Act provisions will be reviewed during detailed design, and any contractor engaged by Metrolinx will be required to adhere to and comply with the Navigation Protection Act, including any approvals required under that Act prior to construction.

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 NPA and will submit/obtain all required permits/approvals under the NPA 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.

In addition, 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 electrification project design, construction and operation do not adversely affect airport operations, Metrolinx has undertaken consultation with NavCanada (NavCan) and the Greater Toronto Airports Authority (GTAA) as part of the TPAP. Consultation with NavCan and GTAA will continue throughout Detailed Design phase to ensure that any required agreements, approvals or authorizations are obtained prior to project implementation (see Sections 1.3.1.10 and 1.3.1.11).

3.1.10 NAVCanada

The following commitments will be adhered to during detailed design:

- Consultation with NavCan 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 actual operating conditions, as well as remediation measures if allowable thresholds are exceeded.
- Further discussions will be held with GTAA and NavCanada to confirm expansion plans and potential areas of interference during detailed design.
- A NavCanada Land Use Proposal Submission Form is required for any new structures, infrastructure, modification to existing or proposed construction equipment that will be used for the electrification project. The requirements of this submission form will be confirmed during detailed design and adhered to as required.

3.1.11 Greater Toronto Airports Authority

The following commitments will be adhered to during detailed design:

- 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
- 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.
- 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.
- As applicable, the Contractor will be required to complete and provide evidence of compliance with the provisions identified in the Facilities Alteration Permit (FAP) Process.
- Further discussions will be held with GTAA and NavCanada to confirm expansion plans and potential areas of interference during detailed design.

3.2 Provincial

3.2.1 Ministry of the Environment and Climate Change

3.2.1.1 Environmental Assessment Act – Transit Project Assessment Process

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 Transit Project Assessment Process (TPAP) must be prepared. This 120 day process commences with the filing a Notice of Commencement, includes stakeholder consultation opportunities and concludes with a Notice of Completion. The TPAP is complete when a Statement of Completion is filed with the Director and Regional Director of the Ministry of the Environment and Climate Change (MOECC).

3.2.1.2 MOECC Model Municipal Noise Control Bylaw

The MOECC stipulates limits on noise emissions from individual items of equipment, rather than for overall construction noise. In the presence of persistent noise complaints, sound emission standards for the various types of construction equipment used on the project should be checked to ensure that they meet the specified limits contained in MOECC Publication NPC-115 – "Construction Equipment" (MOE 1977b).

3.2.1.3 Permit to Take Water

Permits to Take Water (PTTW) are issued under Section 34 of the *Ontario Water Resources Act* (OWRA) for temporary water takings that exceed the trigger threshold of 50,000 L/day (or 7.5 Igpm). The need for dewatering during construction activities will be confirmed during detailed design, as will the requirement for a PTTW (if more than 50,000 litres per day of groundwater is to be pumped) or an Environmental Activity Sector Registry. It is noted that dewatering is not anticipated to be required during construction

activities. Potential impacts will be assessed and strategies for mitigation will be proposed during detailed design as part of the PTTW application process, if required.

Should either be required, monitoring will be undertaken (e.g., pumping rate/volume monitoring, groundwater level monitoring and groundwater discharge monitoring) during construction dewatering will be implemented as required.

3.2.1.4 Environmental Compliance Approval

An Environmental Compliance Approval (ECA) for stormwater works/drainage (or modifications to existing ECA, if applicable) will be obtained, as required, from the MOECC for each of the Tap and Traction Power Facilities sites prior to construction.

3.2.1.5 Ontario Water Resources Act

For any private water supply wells that were identified as being located within the property boundaries of the proposed tap/traction power facilities as detailed in Volume 3 of this EPR/Appendix V, 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.

3.2.1.6 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 groundwater impact assessment completed as part of the TPAP 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 groundwater impact assessment, potential effects from the Metrolinx electrification project were assessed and mitigation measures were identified along with the need for further assessment during the detailed design stage of the project (see Volume 3 of this EPR and Section 1.18 below).

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 EPR, in terms of electrification 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 Sections 1.7.6.10 and 1.18.

3.2.2 Ministry of Natural Resources and Forestry

3.2.2.1 General

During the detailed design/construction phases, Ministry of Natural Resources and Forestry (MNRF) will be consulted with respect to Endangered Species Act (ESA) permitting/authorization requirements as well as potential permitting requirements under the Lakes and Rivers Improvement Act and/or the Public Lands Act. As part of this consultation, potential impacts from any construction activities, including creation of access roads, construction pads, erosion and sediment controls, traction power facilities, tree removals, and other related disturbance activities will be discussed with MNRF.

Generally speaking, MNRF will be contacted as early in the detailed design process as possible to discuss any required permitting/authorizations to ensure these approvals are secured in advance of construction.

3.2.2.2 Species at Risk

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 Ministry of Natural Resources and Forestry (MNRF) 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 MRNF (as per *Ontario Regulation 242/08*).

With regard to the GO Network Electrification TPAP the following items are anticipated:

- **Butternut Trees** - Any Butternut trees found during detailed tree inventories will require a Butternut Health Assessment to be completed by a qualified Butternut Assessor. Dependent on the number and health of Butternuts impacted, registration or permit will be required in consultation with MNRF.
- **Eastern Meadowlark & Bobolink** – certain Tap/TPF sites may require a Notice of Activity (Registration) Process depending on the crop (and therefore habitat) at detail design;
- **Redside Dace** – several watercourses (Rouge River (LSE-5), Little Rouge Creek (SV-6), Robinson Creek & Bruce Creek (SV-4), East Humber River (BR-5) and Fourteen Mile Creek (LSW-6)) have been identified as habitat for Redside Dace. The regulated habitat extends the meander belt width plus 30m on either side. Therefore any work within the regulated is subject to approval under the ESA. The type of approval will need to be determined in consultation with MNRF during detail design. This may include the Notice of Activity Process, Letter of Advice from the MNRF, or a 17(2)(c) permit;
- **Bats –** Based on consultation with MNRF, further studies may need to be completed at detail design (detailed SAR bat surveys, during detailed tree/veg inventories surveys for snags/tree cavities) to determine any approvals that may be required for bats; and

- **Barn Swallows** – prior to construction for bridge modifications, surveys will need to be completed to determine if Barn Swallows are present. If Barn Swallows are present, Notice of Activity (Registration) will be required.

3.2.2.3 Forestry Act

Compliance with the provincial *Forestry Act* may be required in limited instances where trees are planted or removed on the boundary between two lands (i.e., lands that are Metrolinx owned and lands that are not Metrolinx owned). The requirements of the *Forestry Act* will be further reviewed in relation to the Electrification project as part of detailed design. .

3.2.3 Ministry of Tourism, Culture and Sport

The Ministry of Tourism, Culture and Sport (MTCS) is responsible for overseeing all approvals related to the *Ontario Heritage Act*, including:

- Sign-off on proposed archaeological assessment documentation;
- Should any heritage attributes be removed or demolished as part of the Electrification undertaking, approval from the MTCS will be required;
- Properties that are identified as Provincial Heritage Properties of Provincial Significance will be subject to MTCS approvals in relation to removal or demolition activities; and
- Alterations to a Provincially Significant Heritage resource will require a modified Conservation Plan, and approval from the MTCS will be obtained.

Also refer to Sections 1.5 and 1.6 for additional commitments related to Cultural Heritage and Archaeology.

3.2.4 Ministry of Transportation

Permits will be required from the Ministry of Transportation (MTO) prior to any work taking place within or adjacent to the Highway ROW. MTO encroachment permits are also required for any investigation or survey work within the ROW prior to construction.

Further coordination and discussions will be undertaken during detail design with respect to the Barrie Collingwood Railway 2X25kV Feeder Route once the preferred design (aerial or underground) has been confirmed.

Continued coordination with MTO will be undertaken as the project's design progresses, as well as during construction as required, particularly when any modifications are proposed within MTO ROW and/or to MTO structures.

3.2.5 Independent Electricity System Operator

Customers requesting a new or modified connection to Hydro One's transmission system must apply and register with Hydro One and the Independent Electricity System Operator (IESO). Prior to connection, the connection facility owner must register with the IESO and Metrolinx must also register as a Market Participant. To register and connect to the IESO-controlled grid, Metrolinx will need to complete a System Impact Assessment which gathers technical information to ensure that the facilities meet required performance standards and IESO Market Rules.

3.2.6 Hydro One Networks Inc.

3.2.6.1 Connection Agreement

Metrolinx will continue to work with Hydro One Networks Inc. to ensure all implementation issues are addressed as required for the GO Rail Network Electrification Project. In addition, Metrolinx will need to make a Connection Application to Hydro One. Hydro One will complete a Customer Impact Assessment and conduct a Cost Estimate Study. A Connection Cost Recovery Agreement is required to secure funding and to contract for engineering, construction and commissioning work done by Hydro One. Prior to connection, Metrolinx will enter into a Transmission Connection Agreement for ongoing operations with the Transmitter.

3.3 Municipal

Although Metrolinx as a Provincial Agency, is not subject to municipal permits and approvals, Metrolinx policy is to adhere to the intent of the relevant permits/approvals requirements to the greatest extent possible, and to submit applications for review and information.

Metrolinx will continue to communicate and engage with local municipalities during the subsequent detailed design phase and during construction planning to ensure that any municipal concerns are addressed in the design/construction plans prior to commencement of construction activities, as follows:

- As a Crown Agency, Metrolinx is not bound by zoning by-laws passed by municipalities under s.34 of the *Planning Act* and as such does not have a requirement to apply for and obtain zoning amendments. However, Metrolinx will consult with, and have regard for, municipal planning policies with regard to specific projects (or components thereof) and will comply with municipal requests when and where reasonable and feasible;
- When developing plans for new or expanded infrastructure, Metrolinx will coordinate with municipal staff to ensure infrastructure is constructed to meet municipal requirements to the greatest extent possible;
- Submissions relating to building permits and Site Plan approvals (e.g., Traction Power Facilities) will be made in the spirit of co-operation and to provide the municipality with an opportunity to comment;
- Submissions relating to sewer discharge approvals, in accordance with the municipality;

- Submissions relating to permits for construction or occupancy within the existing road allowances;
- Submissions relating to permit-to-enter, road cut permits, and/or lane closures from local road authorities in order to perform utility removal or relocation work;
- Submissions relating to work that directly affects Regional/Municipal infrastructure (e.g., bridge or water/sewer line modifications) as well as Road Occupancy Permits for any work within a Regional ROW
- Submissions relating to property access permits for any temporary or permanent access to a Regional road.
- Submissions relating to municipal heritage permits for alterations to cultural heritage resources and landscapes.
- Submissions relating to municipal Natural Feature Protection By-laws, Private Tree By-Laws, Street Tree By-Laws, and Parks By-Laws (as applicable);
- Compliance with municipal by-laws and obtain permits for all proposed tree removals on private property (in addition to approval/permission from the property owner). Metrolinx does not require permits for tree removals on their property;
- Any new works within 60 m of an existing TTC structure or other applicable transit stations will require formal submissions, coordination meetings.

3.3.1 Municipal Noise By-laws

The majority of municipalities within the study area have their own applicable noise guidelines (which provide sound limits) that are usually found within their noise control by-laws. As the rail corridors span across multiple municipalities, each municipality will need to be identified and investigated by the Contractor for the applicable by-laws.

When possible, construction should be limited to the time periods allowed by the locally applicable bylaws (generally during the daytime hours and during weekdays). Certain type 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. As part of the electrification construction activities, nighttime work may be required. Although Metrolinx is exempt from municipal noise control by-laws that place limits on the timing of construction activity, Metrolinx (and their Contractor) will strive to adhere to such bylaws by limiting nighttime noisy activities wherever practical.

3.3.2 Municipal Sewer Use By-Laws

As noted above in Section 1.3.3, applications may be submitted for review and information to municipalities relating to sewer discharge that may be required due to construction dewatering activities.

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.

As further detailed in Section 1.7.5, Metrolinx is currently developing a Metrolinx Compensation Protocol for Metrolinx projects. Permits and approvals related to Municipal Tree By-laws and other applicable municipal tree removal permits (as summarized in **Table 3-1**) will be obtained as appropriate.

Table 3-1: Municipal Tree By-Laws

Conservation Authority	Region	Municipality	By -Law Name	By-Law Details	Replacement Ratio
Conservation Halton	Halton		Tree By-law 121-05	A Harvest or Special Council permit is required to destroy or Injure any Tree located in Greenlands or in Woodlands 0.5ha or larger. A landowner can remove up to 24 cubic meters for personal use, as long as it is done according to Good Forestry Practices and doesn't reduce the woodlands below the definition of a woodland. Can also remove for normal farming activities or with a registered Forest Mgt Plan.	No compensation required
Conservation Halton		Burlington	Public Tree By-law 68-2013	Provides protection for trees located within the city's road allowance and within parks and facilities. A Tree permit may be issued to injure/destroy a Public tree. The permit may include a requirement that a Tree or Trees be replaced by a tree or trees of a certain size and species; a requirement that the site of the work be restored to its original condition. Where its removal is not required due to age, health or other reasons in accordance with sound arboriculture principles, the applicant shall plant Tree(s) with the total combined diameter being equal to or greater than that of the Tree(s) to be removed. Where any Tree located on Public Property is damaged to the degree that it must be replaced, the City Arborist may take whatever actions are required to obtain compensation for the City for the loss of the Tree.	
Conservation Halton		Oakville	Private Tree By-law 2009-145	Applies to all private property but not to woodlands which are covered by the Halton Region By-law. Not required for dead or	

Conservation Authority	Region	Municipality	By -Law Name	By-Law Details	Replacement Ratio
				hazardous trees. Notification is required if removing or injuring 1-4 trees b/w 20cm - 76cm in one year Or you're moving dead or hazardous trees over 20cm. A Permit is required if you're removing or injuring 5 or more trees b/w 20cm-76cm Or 1 or more tree over 76cm in one calendar year. Permit conditions may include: the number, size and species of trees to be replanted.	
			Public Tree By-law 2009-025	No person shall injure, destroy, plant, or preform unauthorized acts in a tree protection zone. Forester can order the situation rectified or recover costs of doing so. If convicted of offence there is a penalty ($500-$100,000+), plus the person may be ordered to replant trees of comparable size and/or make payment of the tree(s) amenity value as determined by the Town.	
			Site alteration by-law 2003-021	No person shall injure or destroy any municipal tree or other protected tree without a permit. The court may order the person to rehabilitate the land or plant or replant trees in such manner and within such period as the court considers appropriate, including any silvicultural treatment necessary to reestablish the trees.	
			Parks By-Law 2013-013	No person shall injure, destroy, or plant a tree in a Park without a permit.	
TRCA/ Credit Valley	Peel		N/A		
Credit Valley Conservation Authority		Mississauga	Private Tree Protection By-Law 254-12	Property owners must apply for a permit if they wish to remove 3 or more trees (living or dead) over 15cm (6in) in diameter per calendar year.	• 1:1 ratio for trees under 50 cm (20in) in diameter.

Conservation Authority	Region	Municipality	By -Law Name	By-Law Details	Replacement Ratio
					2:1 ratio for trees greater then 50 cm (20 in).
			Site Plan & Development applications http://www.mississauga.ca/portal/residents/parks-site-plan-development-applications	If you are removing trees through the site plan process, replacement trees will be determined through the Site Plan Application file with the Planning and Building Department. If you are requesting to remove a City tree, this request will be considered and evaluated by Forestry. Costs associated with the removal of a City tree is paid for by the landowner and may include amenity value (the environmental value of the tree), administration fees, tree removal and replacement cost. Based on "Guide for Plant Appraisal"	
			Parks By-law 186-05	If trees are damaged for permited works in the City, the permit holder will need to repair and or compensate to the satisfaction of the City. The permit holder may be required to provide studies or documentation to determine the extent of damage.	
TRCA/Credit Valley		Brampton	Tree Preservation Bylaw 317-2012	Landowner can apply for a permit for injury or removal of healthy trees 30 cm and greater. Council may impose conditions the species, size, number and location of replacement Trees to be planted and measures to mitigate the effects of the injury on the natural environment.	3:1 ratio
			Woodlot Conservation By-law 316-2012	A permit is required to injure or removal a tree from a Woodlot over 0.2 hectares. Excluding hazards, emergency work and agricultural operations as part of normal farm practice. The permit will define the species, size, number and	3:1 ratio

Conservation Authority	Region	Municipality	By -Law Name	By-Law Details	Replacement Ratio
				location of replacement Trees to be planted to the City's satisfaction	
			Park Lands By-law 161-83	A permit is required where the crossing may disturb trees or shrubs. An amount will be determined by the Commissioner which represents the replacement cost of any tree or shrub which might be damaged.	
TRCA/ Credit Valley		Caledon	Woodland Conservation By-law NO. 2000-100	A permit is required for the destruction of trees within a Woodland that is a minimum of 0.5 hectares. Conditions of the permit will include the species, size, number and location of replacement trees to be planted by the applicant.	
TRCA/ Lake Simcoe	York		Forest Conservation Bylaw (BILL NO.70 BYLAW NO.2013-68)	Under the bylaw, landowners require a permit before they can remove trees from treed areas greater than 0.2 hectares (0.5 acres). A permit must be obtained before any trees are injured or removed.	
TRCA		Markham	Tree Preservation Bylaw 2008-96	Property owners must apply for a permit before injuring or destroying any healthy tree in Markham with a trunk diameter of 20 cm (about 8 inches) or more, measured at 1.37 metres (about 54 inches) above the ground at the base of the tree.	• 2:1 for 20-40cm 3:1 for 40cm + or aborist report (ranges from $5,000 to $40,000 on average)
TRCA		Richmond Hill	Private Tree Preservation By-law 41-07	No person shall injure, destroy, or permit cause to be injured, a tree in the municipality with a trunk diameter of more than 20cm DBH without a permit. Not applicable to trees within woodlots, which are governed by the York Region Forest Conservation By-law	• Cash in lieu acceptable (120% of cost to plant and maintain for 2 years

Conservation Authority	Region	Municipality	By -Law Name	By-Law Details	Replacement Ratio
TRCA		Vaughan	Private property tree protection by-law 185-2007[1]	No person shall injure or destroy any tree with a tree (DBH) or base diameter of 20cm + without a permit	n/a
			Public Property tree protection by-law 95-2005	No person shall abuse, attach, burn, cut down, damage, destroy, injure, paint, paste, peel, prune, pull up, remove, scrape, tack, top, transplant or trim all or any part of a tree located on public property.	
TRCA/ Lake Simcoe		Aurora	Private Tree Protection By-law 5850-16	Permit required for the injury or destruction of: more than 2 trees on any one property less than 0.25 hectares in an area within any 12 month period having a trunk diameter of more than 20 cm DBH and less than 70 cm DBH; on properties greater than 0.25 hectares, more than 2 trees per every 0.25 hectares of area on a given property within any 12 month period having a trunk diameter of more than 20 cm DBH and less than 70 cm DBH; any tree having a trunk greater than 70 cm DBH; any heritage tree.	
TRCA/ Lake Simcoe		King		There is no applicable municipal By-law that regulates the removal of private property trees	
TRCA/ Lake Simcoe		Whitechuch Stouffville		There is no applicable municipal By-law that regulates the removal of private property trees	
Lake Simcoe Conservation Authority		East Gwillimbury		There is no applicable municipal By-law that regulates the removal of private property trees	
		Newmarket[2]	Woodlot Bylaw 2007-71	No person shall cause or permit the injuring or destruction of a protected tree without a permit	

[1] By-Law 205-2007 amended By-Law 185-2007.
[2] Newmarket is also governed by the following by-law: York Region's Forest Conservation Bylaw 2013-68 (applicable to Woodlots over 1ha).

Conservation Authority	Region	Municipality	By -Law Name	By-Law Details	Replacement Ratio
Lake Simcoe Conservation Authority			Tree Preservation, Protection, Replacement and Encroachment Policy		
TRCA	Toronto			Toronto has a variety of tree and natural feature protection by-laws. They include Street Tree, Private Tree, Ravine and Natural Feature Protection and the Parks By-laws.	
			City Street Tree By-Law (Article II of Chapter 813)	Trees on City Streets: All trees located on City streets are protected under MC 813, Article II, Trees on City Streets Bylaw. A permit must be obtained prior to undertaking any work that may cause injury or require the removal of a tree protected under this bylaw.	
			Private Tree By-Law (Article III of Chapter 813)	Trees on Private Property: Privately owned trees that are at least 30cm in diameter as measured at 1.4m above ground level are regulated by MC 813, Article III, Private Tree Protection Bylaw. Trees of any diameter that were planted as a condition of a permit issued under this bylaw or a site plan agreement are also protected. A permit must be obtained prior to undertaking any work that may cause injury or require the removal of a tree protected under this bylaw.	1:1 ratio
			Ravine and Natural Feature Protection By-Law. Chapter 658	Ravine and Natural Feature Protection (RNFP): A permit must be obtained prior to undertaking any work that may cause injury or require the removal of any tree, the placing or dumping of fill or refuse, or altering the existing grade within ravine protected areas as outlined under MC 658, RNFP Bylaw.	3:1 ratio
			Parks By-Law. Article VII, Chapter 608	Trees in Parks: All trees located in a City park are protected under MC 608, Article VII Parks Bylaw,	Between 1:1 to 3:1

Conservation Authority	Region	Municipality	By -Law Name	By-Law Details	Replacement Ratio
				Trees. A permit must be obtained prior to undertaking any work that may cause injury or require the removal of a tree protected under this bylaw. Permits to remove trees are issued conditional on planting replacement trees. Standard replacement ratios are 1:1 for Parks and Street Trees and 3:1 for Private trees and Ravine and Natural Feature Protection (RNFP) trees. In RNFP protected areas, permits to injure trees are also issued conditional on planting replacement trees. The standard ratio is 1:1. These ratios are subject to change at City of Toronto's discretion.	
TRCA/ Lake Simcoe/ Central Lake	Durham		Regional Tree By-law No. 31-2012	Applies to woodlands 1 hectare and greater. Less then 1 hectare is municipal responsibility. Two types of permits. A Good Forestry Practices Permit - where more than 50 trees are to be removed, or if the woodland trees are to be removed, or if the Woodland contains a Sensitive Natural Area, a Forest Management Prescription may be required. A Clear Cutting Permit - if you are removing an entire woodland or an area 0.1 ha (1/4 ac) or greater.	
TRCA/Lake Simcoe		Uxbridge		There is no applicable municipal By-law that regulates the removal of private property trees	
TRCA		Pickering	Tree Protection By-law No. 6108/03	Applies to trees over 25 cm within the Tree Protection Area. A permit is required to injure or remove a tree in a Protection Area. "Tree Protection Area" includes areas designated as Shorelines and Stream Corridors, Wetlands and Environmentally Significant Areas and areas	

Conservation Authority	Region	Municipality	By -Law Name	By-Law Details	Replacement Ratio
				within 30 metres. Dead, dying, hazard trees exempt.	
TRCA		Ajax	Tree Protection By-law No. 137-2006	A permit is required to injure or destroy a tree within the applicable areas set in schedule A and B include: areas designated as Environmental Protection, Open Space, Town-Wide Park, Community Park, or Neighbourhood Park pursuant to Schedule "A" of the Town's Official Plan; and Any land or part of land in an area zoned as Private Open Space pursuant to the Town's Zoning By-laws. A Permit is subject to conditions that ensure that all other trees are protected in accordance with good arboricultural practices and may require a replanting plan to replace any trees.	
Central Lake Conservation Authority		Whitby	Tree Protection By-law 4640-00	A permit is required to destroy any tree that is located in a woodlot; located on lands designated "Environmental Protection/Conservation Lands", "Major Open Space" or "Hazard Land"; located within "Mature Woodlands" area or "Environmentally Sensitive Area"; identified in a tree preservation plan; located on "Residential" lands which are 2.02ha or greater in size.	
Lake Simcoe Conservation Authority	Simcoe County		Forest Conservation Bylaw 5635	Located in a Woodlands or Sensitive Natural Area. Three types of permits: Good Forestry Practices; Conifer Plantation; Harvesting. Can also apply for a Special Permit.	
Lake Simcoe Conservation Authority		Bradford West Gwillimbury		There is no applicable municipal By-law that regulates the removal of private property trees	

Conservation Authority	Region	Municipality	By -Law Name	By-Law Details	Replacement Ratio
Lake Simcoe Conservation Authority		Innisfill		There is no applicable municipal By-law that regulates the removal of private property trees	
Lake Simcoe Conservation Authority		Barrie	Tree Preservation By-law 2014-1150	Bylaw applies to all trees in woodlots within boundary of the City. Defines woodlot as land at least 0.2 hectares in area with tree density of: a. 1000 trees of any size per hectare b. 50 trees measuring over 5 cm DBH per hectare c. 500 trees measuring over 12 cm DBH per hectare d. 250 trees, measuring over 20 cm DBH per hectare. No owner shall without a permit cause or permit to cause the injury or destruction of a tree on owners land	

3.3.4 Conservation Authorities

As a Crown Agency, 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. Notwithstanding this, wherever possible, Metrolinx will engage Conservation Authorities on specific projects (or components thereof) and will adhere to requirements when and where possible and feasible on aspects such as:

- Tree protection and removal/injury;
- Sewer discharge;
- Requirements for work/activities (e.g., excavated material removal) within the limits of Regulated Areas as defined under the Conservation Authorities Act.

In addition, Metrolinx will engage Conservation Authorities post TPAP, as appropriate, in relation to finalizing the Tree/Vegetation Compensation Protocol.

3.3.4.1 Toronto Region Conservation Authority

The following commitments specific to the Toronto and Region Conservation Authority (TRCA) will be adhered to post TPAP:

- 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. In this regard, further consultation with TRCA will be undertaken at the detailed design stage, including TRCA's archaeological staff as required prior to disturbance.
- It is also noted that currently there are no TRCA lands identified for acquisition as part of the electrification undertaking. Should this change during detailed design, the Contractor will follow the procedures required by TRCA to seek formal approval.
- Further discussions and coordination with TRCA will be undertaken as appropriate during detail design with respect to Living City Policies.

4 Design/Engineering Commitments

4.1 Barrie Collingwood Railway 2x25kV Feeder Route

The Barrie-Collingwood feeder route will commence at the Allandale TPS location and will run east along the Barrie-Collingwood Railway (BCRY) ROW under Highway 400 to the termination limit of electrification on the Barrie Corridor (i.e. Allandale Waterfront GO Station). During detailed design, either the aerial

feeder route or underground cable design option will be confirmed in consultation with the City of Barrie/Barrie Collingwood Railway. The BCRY is not owned by Metrolinx, therefore an agreement will be required from the City of Barrie/Barrie Collingwood Railway for the installation of the feeder route along the rail ROW.

4.2 OCS Attachments

During detailed design, if there are areas along the rail corridor ROWs where OCS infrastructure (poles, foundations, support structures) cannot be accommodated within Metrolinx owned ROW, and an engineering solution is not feasible, Metrolinx will identify affected property owners and follow the process as outlined in Section 1.14 of this EPR.

During detailed design if there are areas along the rail corridor ROWs where OCS infrastructure needs to be attached to third party property (e.g., retaining wall, building, etc.), Metrolinx will consult the affected property owner and follow the process as outlined in Section **14** of this EPR. In addition, Metrolinx will undertake a condition survey and structural review of any affected buildings, retaining walls or any other property to which an OCS attachment is deemed required for the proposed attachment connections and loads from any OCS structures.

4.3 Bridge Modifications

As outlined in Volume 1 of this EPR, there are numerous (OH) bridges (i.e., roadway, pedestrian walkway, or railroad traffic over GO rail corridors) and rail overpass bridges (i.e., bridges carrying GO rail corridors to over roadways, pedestrian tunnels, or waterways) along the rail corridors to be electrified. While there are some structures that will not require any type of modification to facilitate electrification, there are several that will require one or more modifications as follows:

i. OCS Attachments
   - to allow for electrification through/under the structure

ii. Bridge Protection Barriers
   - to protect pedestrians and travelers/infrastructure users within the public right-of-way, and electrification equipment

iii. Modifications to Achieve Minimum Clearance
   - Options include raising or replacing[3] the overhead bridge structure and/or, lowering the tracks, and/or improves to track maintenance allowance, in order to achieve minimum vertical clearance requirements

iv. Grounding and Bonding
   - to prevent damage from flashovers to the bridge structures
   - to prevent step and touch potential from exceeding permissible limits as defined in the applicable standards.

[3] Refer to Section 1.4.3.1 for further detail.

The recommendations for modifications included in this EPR are based on preliminary conceptual level engineering analysis. Therefore, during detailed design, the type of modification for each bridge and rail overpass will be confirmed.

For structures that are jointly owned by Metrolinx and a municipality or other third party, consultation with the relevant structure owner will be carried out as part of establishing the final modifications and design.

4.3.1 Bridges Requiring Replacement

As part of the conceptual engineering process carried out as part of the TPAP, several overhead bridges (including Pedestrian Bridges) have been identified as requiring replacement in order to accommodate electrification. These bridges are described and listed in Volume 3 of this EPR.

For all bridge structures requiring replacement, it was assumed that any/all environmental impacts would be confined to within the Metrolinx owned rail ROW/existing pedestrian bridge footprint. However, during detailed design, Metrolinx in coordination with relevant municipalities will determine the final design requirements for the new replacement structures. As part of this process, it is recognized that additional impacts beyond Metrolinx's rail ROWs may be identified and will therefore require additional environmental/planning studies to determine the preferred design options and to identify impacts and mitigation measures to alleviate these effects. It is anticipated that these additional studies will be completed as part of a *TPAP Addendum* to this EPR in association with affected municipalities as/if appropriate.

4.3.1.1 Dunn, Dufferin, Dowling, Jameson Bridges

The detailed assessment of potential environmental impacts and public/stakeholder consultation related to the replacements of Dunn Ave. Bridge, Dufferin Ave. Bridge, Jameson Ave. Bridge, Dowling Ave. Pedestrian Bridge on the Lakeshore West corridor will be carried out as part of an EPR Addendum process to the GO Rail Network Electrification TPAP (once approved), based on the preparation of a more detailed level of design. The City of Toronto and Toronto Transit Commission (TTC) will be engaged as appropriate in the Addendum process.

Metrolinx is currently engaged in discussions with City of Toronto regarding the Dufferin Bridge including the proposed Light Rail Transit extension. Metrolinx will continue to work with the City of Toronto towards a resolution post TPAP.

4.3.2 Bridge Barrier Design

For structures that are jointly owned by Metrolinx and a municipality or other third party, consultation with the relevant structure owner will be carried out as part of establishing the final bridge barrier design requirements.

Also refer to **Section 12.4** that discusses specific commitments related to the aesthetic elements of bridge barriers.

4.3.3 Heritage Bridges

With respect to any/all proposed bridge or rail overpass modifications, if during detailed design a change to the proposed modification to any structure is identified that differs from those described in EPR Volume 1, the process for determining whether or not the structure has cultural heritage interest or value and subsequently the determination of measures to preserve the cultural heritage attributes of the structure will be strictly followed as outlined in Section **5** of this EPR Volume. This process will involve consultation/coordination with the Ministry of Tourism, Culture and Sport and relevant municipalities, as appropriate.

4.3.4 Structural Assessments

As part of conceptual design, preliminary calculations for structural loading of bridge barriers were completed and it was determined that the loading was minor for road bridges. During detailed design, Metrolinx will confirm requirements for undertaking structural assessments and/or condition assessments for bridges to ensure that the bridge can withstand the increased load of adding a solid barrier to the face of the bridge, and to confirm requirements for additional strengthening. These assessments will be submitted as required to the owner of the structure for review and approval.

4.4 Upgrade of Hydro One Essa 115kV Line

Hydro One is planning to upgrade the existing 115 kV transmission line between Essa Transformer Station (TS) and Barrie TS to a 230kV line. This project will be assessed under the *Class Environmental Assessment for Minor Transmission Facilities.* The upgraded line will supply electric power for electrification of the GO network.

4.5 Construction Staging Areas

The following commitments will be adhered to during detailed design/construction with respect to selection of staging areas:

- The locations of construction staging areas were not identified at the conceptual design phase and therefore will need to be identified during detailed design.
- As part of identifying staging areas, the Contractor will be responsible for identifying and subsequently complying with any environmental study/approval requirements in accordance with applicable environmental legislation including but not limited to the *Environmental Assessment Act*.
- Follow the necessary property acquisition/easement process pertaining to identification of staging areas as/if applicable (see Section 1.14);

- The City of Toronto's Natural Areas/Parks will be avoided when selecting staging areas during detailed design in order to avoid impacts to these natural areas.

4.6 Grounding and Bonding

To ensure safe touch-and-step potential in accordance with permissible limits (as per applicable international electrical safety codes and standards including AREMA, CSA, EN and IEEE), a grounding and bonding system will be implemented as part of the electrification project. Touch potential is defined as the voltage between an energized object and the feet of a person in contact with the object. Step potential is defined as the voltage between the feet of a person standing near an energized grounded object. A maintenance and inspection procedure for installed grounding and bonding will also be developed.

Grounding and bonding will be installed within 4 meters of the track; notwithstanding this, an evaluation out to 10m of the track will be undertaken during detailed design to confirm whether anything else in the vicinity will require grounding.

In addition, the following review process will be carried out during detailed to mitigate any identified effects to property owners due to grounding and bonding installation:

- A case by case analysis of any non-Metrolinx owned properties that may be affected by grounding and bonding installation with the rail Right-of-Way will be undertaken;
- Engage potentially affected property owners, where required.

4.7 Phasing Strategy and Rolling Stock

As part of the next phase of the project, Metrolinx will determine the phasing strategy for implementation of electrification across the GO network and select the preferred electric rolling stock.

4.8 Maintenance Plans/Operational Procedures

Metrolinx will develop detailed maintenance plans and procedures for the new electrified system for the operational phase to ensure safety and reliability of the system. In addition, Metrolinx will develop emergency response plans with emergency service providers to ensure fire, police and emergency medical services are maintained during construction and operation.

4.9 New OCS Maintenance of Way Facilities

The locations of OCS Maintenance-of-Way facilities will need to be determined during the detailed design phase. Any potential impacts related to property or any other environment aspects will need to be assessed during detailed design once the preferred locations have been selected and TPAP/EPR Addendum requirements will be confirmed and carried out as appropriate.

4.10 Tap Facilities/Traction Power Facility Design

As part of detailed design, final site configuration of the tap facility and traction power facility equipment and access routes to the facilities will be finalized.

4.10.1 Access Routes

- If new or additional easements are required in order to build new access roads, these easements will be obtained prior to project implementation. In addition, the detailed design of the Taps/TPFs will take into account the space for emergency vehicle turn arounds and will be coordinated with the relevant affected stakeholders as appropriate.
- The City of Toronto's Natural Areas/Parks will be avoided when selecting Tap/TPF access routes during detailed design in order to avoid impacts to these natural areas.

4.10.2 Don Yard Paralleling Station

Coordination and consultation with the City of Toronto, Waterfront Toronto, Toronto and Region Conservation Authority, and other interested/affected stakeholders will be carried out as part of detailed design to determine the final design of the Don Yard PS facility in relation to the following proposed developments in the vicinity of the PS site:

- Gardiner Expressway East Realignment;
- Don Mouth naturalization and Port Land Flood Protection Project (DMNP);
- The Unilever Site (First Gulf);
- New SmartTrack/Relief Line station; and,
- Broadview Ave. Extension Project.

4.10.3 Scarborough Tap Location

As part of detailed design, the Scarborough Tap infrastructure (located south of Lawrence Ave E. in the vicinity of the Stouffville rail corridor) will be designed such that the final configuration of the facility/equipment will be situated as far away as possible from the existing residential area to the south of the facility location and east of the Stouffville rail corridor.

4.11 Freight Operations/VIA Rail

Electrification of the GO Rail Network will entail certain modifications to the operations/maintenance practices of freight operators (Canadian National Railway, Canadian Pacific Railway) and VIA Rail which may include immunization of track circuits and grade crossings, impedance bonds as well as bonding & grounding. 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.

4.12 Construction Management Plans/Traffic Management Plans

Construction Management Plans as well as Traffic Management Plans will be developed prior to commencing construction and will be implemented by the Contractor during construction, taking into consideration applicable legislation as appropriate. The development of these plans and construction timelines/communication plans will be undertaken in coordination with local municipalities and road authorities.

5 Cultural Heritage Resources

5.1 General

The following general commitments related to cultural heritage will be adhered to:

- Implement all mitigation measures outlined in EPR Volume 3 and EPR Appendix C – Cultural Heritage Impact Assessment Report.
- Staging areas should be selected so that they are non-invasive and avoid heritage attributes;
- Pre-construction vibration studies should be carried out (if needed); and,
- Post-construction landscape treatments carried out to restore pre-construction conditions.

5.2 Additional Heritage Studies/Heritage Impact Assessments

A comprehensive summary of the cultural heritage studies (Screening Assessment, Cultural Heritage Evaluation Reports, Heritage Impact Assessments) completed as part of the GO Rail Network Electrification TPAP is provided in Volume 3 and EPR Appendix C. As a result of the work completed to date, the following table summarizes the mitigation and monitoring commitments, including additional Heritage Impact Assessments, that will need to be completed during detailed design (current as of the time of finalizing this EPR).

For results of the cultural heritage screening process carried out as well as detailed descriptions of all Cultural Heritage Evaluation Reports (CHERs) completed, please refer to Volume 2 and/or the Cultural Heritage Screening Report contained in EPR Appendix C.

Metrolinx has undertaken HIAs for PHPPS properties as part of the GO Rail Network Electrification TPAP (see **Table 5-1**) and the recommendations from these HIAs will be followed and implemented during detail design by the Contractor including strategies to protect heritage attributes. In addition, any/all future HIAs as identified in the table above will be conducted during detailed design and the recommendations of these HIAs will be followed and adhered to by the Contractor during design and construction.

Generally speaking, the following process will be followed post TPAP:

- Undertake any additional HIAs as required (see Table 1-2 for a list of additional HIAs to be undertaken during detailed design).
- HIAs will be reviewed by the Metrolinx Heritage Committee and developed in consultation with relevant municipalities.
- Metrolinx will be responsible for developing a Strategic Conservation Plan. For any new proposed modification to a Provincially Significant property, an HIA will be undertaken and approval from MTCS will be obtained.

- If there is a change in project design post TPAP that causes any additional heritage properties to be impacted by electrification above and beyond those described in this EPR, additional impact assessment work and heritage studies will be undertaken in accordance with applicable federal/provincial legislation.

Table 5-1: Summary of Cultural Heritage Mitigation and Monitoring Commitments

Rail Corridors/ Segments	CHR	Property Name	Metrolinx Heritage Committee Decision[4]	Project Activities	Footprint Impacts	
					Potential Effect	Mitigation/Monitoring Commitments
Union Station Rail Corridor	USRC-1-1	Union Station	Provincial Heritage Property of Provincial Significance	Installation of OCS attachments	Alteration	HIA completed as part of the Electrification TPAP. Results and recommendations of the HIA will be adhered to during detailed design.
	USRC-1-2	Scott Street Interlocking Tower	Provincial Heritage Property of Provincial Significance	None	None	N/A
	USRC-1-3	Cherry Street Interlocking Tower	Provincial Heritage Property of Provincial Significance	None	None	N/A
	USRC-1-4	Lower Jarvis Subway	Provincial Heritage Property	None	None	N/A
	USRC-1-5	Lower Sherbourne Subway	Provincial Heritage Property	None	None	N/A
	USRC-1-6	Parliament Street Subway	Provincial Heritage Property	None	None	N/A
	USRC-1-7	Cherry Street Subway	Provincial Heritage Property	Installation of OCS attachments	Alteration	Conduct an HIA during detailed design
	USRC-1-8	Union Station Heritage Conservation District	Adjacent Protected Property	No direct or indirect impacts to the heritage attributes associated with the HCD were identified as a result of OCS infrastructure. However, given that the railway corridor passes through this HCD, it may be subject to policies identified in the HCD Plan.	Potential Alteration	Consultation with heritage staff at the City of Toronto
	USRC-1-9	Postal Delivery Building	Adjacent Protected Property	None expected	None	N/A
Lakeshore West Corridor (Segments 1 – 8)	LSW-1-1	Dufferin Street Bridge	Provincial Heritage Property – structure was removed	Raising of roadway profile and bridge replacement	None: bridge demolished	N/A: bridge has been removed
	LSW-1-2	Dunn Avenue Bridge	Provincial Heritage Property – structure was removed (2015)	Raising of roadway profile and bridge replacement	None: bridge demolished	N/A
	LSW-1-3	Dowling Avenue Bridge	Provincial Heritage Property – structure was removed (2015)	Installation of bridge protection barrier and OCS wires, possible replacement of bridge	None: bridge demolished	N/A
	LSW-1-4 PHP	Humber River Bridge, Mile 5.02	Provincial Heritage Property	Installation of OCS wires and possibly track portals	Alteration	Conduct an HIA during detailed design
	LSW-1-5	Fort York Heritage Conservation District and National Historic Site	Adjacent Protected Property	None expected	None	N/A
	LSW-1-6	Palais Royale, 1601 Lakeshore Boulevard West	Adjacent Protected Property	None expected	None	N/A
	LSW-2-1	Islington Avenue Bridge	Provincial Heritage Property	Installation of bridge protection barrier, OCS wires, and flash plates	Alteration	Conduct a HIA during detailed design
	LSW 3-1	Etobicoke Creek Bridge	Provincial Heritage Property (MHC Decision pending)	Installation of OCS wires	Alteration	Conduct HIA

[4] For results of the cultural heritage screening process as well as detailed descriptions of all Cultural Heritage Evaluation Reports completed, please refer to Volume 2 and/or the Cultural Heritage Screening Report contained in EPR Appendix C.

Rail Corridors/ Segments	CHR	Property Name	Metrolinx Heritage Committee Decision[4]	Project Activities	Footprint Impacts	
					Potential Effect	Mitigation/Monitoring Commitments
	LSW-4-1	Credit River Bridge	Provincial Heritage Property of Provincial Significance	Installation of OCS wires and possibly track portals	Alteration	HIA completed as part of the Electrification TPAP. Results and recommendations of the HIA will be adhered to during detailed design.
	LSW-4-2	Port Credit Memorial Arena	Adjacent Protected Property	None expected	None	N/A
	LSW-5-1	The General Electric Company	Adjacent Protected Property	None expected	None	N/A
	LSW-6-1	Sixteen Mile Creek Bridge	Provincial Heritage Property	Installation of OCS attachments and track portals	Alteration	Conduct a HIA during detailed design
	LSW-7-1	Bronte Creek Bridge	Provincial Heritage Property	Installation of OCS wires and possibly track portals	Alteration	Conduct a HIA during detailed design
Barrie Corridor (Segments 1-12)	BR-1-1	National Cash Register Company Bldg, 222 Lansdowne Street	Adjacent Protected Property	None expected	None	N/a
	BR-1-2	Former Rail Station at 1550 St. Clair Avenue West	Adjacent Protected Property	None expected	None	N/A
	BR-1-3	St. Clair Avenue West Bridge	Provincial Heritage Property	Installation of OCS wires	Alteration	Conduct HIA
	BR-1-4	York Beltline Trail	Adjacent Protected Property	None expected	None	N/A
	BR-3-1	Don River Culvert	Provincial Heritage Property	None expected	None: Culvert Removed	N/A
	BR-4-1	Maple GO Station	Provincial Heritage Property	Installation of OCS attachments	Alteration	Conduct an HIA during detailed design
	BR-4-2	Village of Maple Heritage Conservation District	Adjacent Protected Property	No direct or indirect impacts to the heritage attributes associated with the HCD were identified as a result of OCS infrastructure. However, given that the railway corridor passes through this HCD, it may be subject to policies identified in the HCD Plan.	Potential Alteration	Consultation with heritage staff at the City of Vaughan
	BR-5-1	Crawford and Maude Wells House	Adjacent Protected Property	None expected	None	N/A
	BR-6-1	Aurora GO Station	Provincial Heritage Property of Provincial Significance	Installation of OCS attachments	Alteration	HIA completed as part of the Electrification TPAP. Results and recommendations of the HIA will be adhered to during detailed design.
	BR-6-2	Radial Railway Bridge Abutment	Adjacent Protected Property	None expected	None	N/A
	BR-7-1	Newmarket GO Station	Provincial Heritage Property	Installation of OCS attachments	Alteration	Conduct an HIA during detailed design
	BR-7-2	Private Residence (Robinson House)	Adjacent Protected Property	None expected	None	N/A
	BR-7-3	Former Newmarket Train Station	Adjacent Protected Property	None expected	None	N/A
	BR-9-1	Bradford GO Station	Provincial Heritage Property	Installation of OCS attachments	Alteration	Conduct an HIA during detailed design
	BR-11-1	Cotellucci Property	Adjacent Protected Property	None expected	None	N/A
	BR-12-1	Former Allandale Train Station	Adjacent Protected Property	None expected	None	N/A
	SV-2-1	Proposed Agincourt HCD	Adjacent Protected Property	None expected	None	N/A

Rail Corridors/ Segments	CHR	Property Name	Metrolinx Heritage Committee Decision[4]	Project Activities	Footprint Impacts	
					Potential Effect	Mitigation/Monitoring Commitments
Stouffville Corridor (Segments 1-7)	SV-3-1	Thomas Rivis House	Adjacent Protected Property	None expected	None	N/A
	SV-3-2	Hagerman Schoolhouse	Adjacent Protected Property	None expected	None	N/A
	SV-4-1	James Eckardt House	Adjacent Protected Property	None expected	None	N/A
	SV-4-2	Unionville HCD	Adjacent Protected Property	No direct or indirect impacts to the heritage attributes associated with the HCD were identified as a result of OCS infrastructure. However, given that the railway corridor passes through this HCD, and modifications to the existing Bruce Creek Bridge located adjacent to the HCD are proposed, policies identified in the HCD Plan may be applicable.	Potential Alteration	Consultation with heritage staff at the City of Markham
	Sv-4-3	Former Unionville Train Station (property also includes the Stiver Mill Complex)	Adjacent Protected Property	None expected	None	N/A
	SV-5-1	Markham GO Station	Provincial Heritage Property	Installation of OCS attachments	Alteration	Conduct an HIA during detailed design
	SV-5-2	Markham Village Heritage Conservation District	Adjacent Protected Property	No direct or indirect impacts to the heritage attributes associated with the HCD were identified as a result of OCS infrastructure. However, given that the railway corridor passes through this HCD, it may be subject to policies identified in the HCD Plan.	Potential Alteration	Consultation with heritage staff at the City of Markham
	SV-6-1	Rouge National Urban Park	Adjacent Protected Property	No direct impacts to the heritage attributes associated with RNUP were identified as a result of OCS infrastructure. However, given that the railway corridor passes through the park, proposed infrastructure improvements may be subject to policies identified in the park management plan. In particular, policies on viewsheds and vegetation.	Potential Alteration	Consultation with park management staff at Rouge National Urban Park
akeshore East Corridor (Segments 1-8)	LSE-1-1	Carlaw Avenue Bridge	Provincial Heritage Property	Installation of OCS wires	Alteration	Conduct HIA during detailed design
	LSE-1-2	Gerrard Street East Bridge	Provincial Heritage Property	Installation of OCS wires	Alteration	Conduct a HIA during detailed design
	LSE-1-3	Riverdale HCD	Adjacent Protected Property	None expected	None	N/A
	LSE-4-1	Highland Creek Bridge	Provincial Heritage Property	Installation of OCS wires	Alteration	Conduct a HIA during detailed design
	LSE-4-2	Purvis Castle Log Cabin	Adjacent Protected Property	None expected	None	N/A
	LSE-5-1	Rouge River Bridge	Provincial Heritage Property of Provincial Significance	OCS wires are to be attached to the newly constructed bridge	Potential Direct Effects: This Metrolinx-owned rail bridge is being replaced with a new bridge structure (as part of a separate Metrolinx project – Lakeshore	The existing Metrolinx-owned rail bridge is being replaced with a new bridge structure (as part of a separate Metrolinx project – Lakeshore East Rail Corridor Expansion [Guildwood to Pickering]). In consideration of the bridge's removal, no direct adverse impacts to the newly constructed Rouge River

Rail Corridors/ Segments	CHR	Property Name	Metrolinx Heritage Committee Decision[4]	Project Activities	Footprint Impacts	
					Potential Effect	Mitigation/Monitoring Commitments
					East Rail Corridor Expansion [Guildwood to Pickering]). Therefore there is potential for direct impacts related to installation of OCS wires to the newly constructed bridge. Potential Indirect Effects: The new structure will require attachment of OCS wires as part of the Electrification project which has the potential to disrupt the bridge crossing's park setting (i.e., indirect effects). Effects to the park setting are considered indirect.	Bridge are anticipated as a result of the proposed Electrficiation project activities. Therefore, no further mitigation is required. The new structure will require attachment of OCS wires as part of the Electrification project which has the potential to disrupt the bridge crossing's park setting (i.e., indirect effects). Effects to the park setting are considered indirect and will therefore be addressed through preparation of a Heritage Impact Assessment during detailed design. The HIA will include MTCS consultation/review. Furthermore, it should be noted that introduction of OCS infrastructure and associated indirect impacts to the park setting of the surrounding Rouge National Urban Park will be mitigated through the following measures as recommended in this report: • During detailed design, efforts will be made to minimize visual effects of the OCS infrastructure as much as possible around the Rouge Beach/Marsh area along the Lakeshore East Corridor and Stouffville Corridor. • The extent of vegetation removal will be confirmed during detailed design. For the purposes of the TPAP, the project team has taken a conservative approach. Further consultation and coordination for any proposed tree/vegetation removals beyond the Metrolinx ROW will be undertaken as the project's design progresses.
	LSE-5-2	Petticoat Creek Culvert	Provincial Heritage Property	None expected	None	N/A
	LSE-5-3	Dunbarton Subway	Provincial Heritage Property	None expected	None	N/A
	LSE-5-4	Miller Memorial Tree	Adjacent Heritage Property	Possible impacts during construction phase due to location of construction laydown site or realignment of trail	None	N/A
	SV-6-1	Rouge National Urban Park	Adjacent Heritage Property	No direct impacts to the heritage attributes associated with RNUP were identified as a result of OCS infrastructure. However, given that the railway corridor passes through the park, proposed infrastructure improvements may be subject to policies identified in the park management plan. In particular, policies on viewsheds and vegetation.	Potential Alteration	Consultation with park management staff at Rouge National Urban Park
	LSE-7-1	Former Whitby Train Station, relocated to 1450 Henry Street	Adjacent Protected Property	None expected	None	N/A
	LSE-8-1	Emanuel Sleep House, 601 Victoria Street	Adjacent Protected Property	None expected	None	N/A

5.3 Union Station Train Shed HIA Recommendations

In accordance with the *Union Station Trainshed Electrification HIA Report* (see Appendix M), the proposed interventions (i.e., modifications due to electrification) will have an impact on the heritage attributes of the structure. However, these impacts can be mitigated as the project undergoes further analysis of its requirements and as part of developing the final design.

The following HIA recommendations will be followed and adhered to during detailed design/construction:

- Ensure connections to trainshed metal truss system and pre-cast cement smoke ducts are simple in design and strategically located in positions that will have the least material and visual impact.
- Limit the number of connections and interventions.
- Alterations including those that require the removal of any Trainshed materials should attempt to be reversible if possible.
- Alterations should be designed in visual harmony with historic features and contemporary design excellence.
- Options for underneath the new glass atrium will need to consider the physical and visual impact on the new space and the Trainshed, particularly where the truss system meets the new glass atrium.
- Explore opportunities to develop a heritage interpretation strategy explored to explain the significance of the Trainshed.

Generally, design solutions should be designed in visual harmony with historic features and contemporary design, including:

- Mitigating material and visual impacts to the metal truss system and pre-cast cement smoke ducts;
- Limiting the number of OCS connections where possible;
- Limiting the removal of any Trainshed material, and allowing for reversibility should any material require removal;
- Minimizing the impact on the original heritage elements on Track 1 and 2;
- Final designs will be reviewed by Parks Canada and the City of Toronto.

Also refer to Sections 1.5.6, 1.5.7, and 1.5.8 for additional commitments related to Union Station Trainshed.

5.4 Credit River Bridge HIA Recommendations

In accordance with the *Credit River Bridge HIA Report* (see EPR Appendix M), the following HIA recommendations will be followed and adhered to during detailed design/construction:

- OCS Attachments should be compatible with the bridge's type and massing and to minimize material interventions.
- Place OCS attachments at edges of the bridge and use materials/finishes to make the new infrastructure physically and visually compatible with, but subordinate to and distinguishable from, the bridge.
- Limit the number of connections and interventions.
- All interventions should be designed to be reversible. Where interventions are undertaken that will result in alterations to material and fabric, documentation should be undertaken in advance of installation activities for future removal.

5.5 Aurora GO Station HIA Recommendations

In accordance with the *Aurora GO Station HIA Report* (see Appendix M), the following HIA recommendations will be followed and adhered to during detailed design/construction:

- Support structures for OCS should be positioned to avoid interfering with views of the station building.
- A comprehensive protection plan should be established for the station building to mitigate any impact from excavation during construction of OCS foundations.

5.6 Easement Agreement and Collateral Agreement – Union Station

Metrolinx will follow the May 1 2006 Collateral Agreement between Parks Canada, City of Toronto, and GO Transit (Metrolinx) for the Union Station Complex The Metrolinx Heritage Committee declared Union a Metrolinx Heritage Property of Provincial Significance on March 29, 2016. Therefore, the Union Station Conservation Plan will be updated accordingly and will be adhered to for all electrification modifications required within the Union Station Train Shed.

As per the collateral agreement:

- The **Easement Agreement** was signed with Parks Canada when Toronto and GO purchased Union Station in 2000 from Toronto Terminal Railway (TTR).
  - The Easement Agreement is meant to protect the Heritage Elements of the Station Complex.
- Alterations to Union Station are subject to the Collateral Agreement (dated May 1, 2006 and as amended) between Parks Canada, the City of Toronto and GO Transit (Metrolinx). The Collateral Agreement outlines a process for the City and Parks Canada to review and approve or refuse proposals that impact heritage elements of Union Station, with Parks Canada having final approval

over proposals. Alterations to the trainshed will require review and approval through the Collateral Agreement process. In the event that Parks Canada approvals conflict with the work approved in the TPAP, Parks Canada's approval shall prevail.

- As Union Station was also identified as a PHPPS and Metrolinx is a public body prescribed under OHA, Approvals under the Collateral Agreement shall be coordinated with the Ministry of Tourism, Culture and Sport, as required (see *Sections 5.7* below).

5.7 MTCS Regulatory Requirements – Union Station

Should any heritage attributes at Union Station be removed or demolished as part of the Electrification undertaking, the Provincial Minister of Tourism, Culture and Sport (MTCS) will need to approve this work. In addition, regulatory agency review of the HIAs will be coordinated as required (i.e., Parks Canada, MTCS, City of Toronto – Heritage Preservation Services).

5.8 Jointly Managed Heritage Resources

For all jointly managed (i.e., Metrolinx and City of Toronto or other municipality) heritage resources (i.e., bridge or rail overpass structures), the following process will be adhered to:

- Complete a Cultural Heritage Evaluation Report, as required;
- Undertake Heritage Impact Assessment in consultation with the relevant municipality;
- Metrolinx's Contractor will prepare and implement an electrification infrastructure management plan in cooperation with the affected municipality;
- Metrolinx will prepare and implement a Strategic Conservation Plan.

5.9 Additional Affected Heritage Resources

For any additional potentially affected resources not previously identified through the TPAP process and documented in this EPR, the following process will be adhered to:

- Carry out a Cultural Heritage Evaluation Recommendation Report (CHER) to identify heritage value and attributes;
- If found to have cultural heritage value by the Metrolinx Heritage Committee, conduct a Heritage Impact Assessment (HIA) during detail design to identify potential impacts and appropriate mitigation measures and incorporate mitigation measures into the final design.;
- Follow Metrolinx Interim Cultural Heritage Management Process (2013), for managing heritage assets;
- For any properties determined by the Metrolinx Heritage Committee to be of provincial heritage value, Metrolinx will include the property on the list of Provincial heritage properties maintained by the MTCS and will provide all related documents (e.g., CHERs, etc.) as appropriate to MTCS.

6 Archaeological Resources

6.1 General

The following general archaeological mitigation measures will be adhere to and implemented:

- Implement all mitigation measures outlined in EPR Volume 3.
- Should changes to the project design include lands that extend beyond the limits of the corridor Vegetation Removal Zone and/or associated power supply and traction facilities as defined in the "Stage 1 Archeological Assessment Report" (ASI, July 2016) (see Appendix D), then further Stage 1 archaeological assessment studies must be conducted to determine the archaeological potential of the affected lands.

6.2 Previously Undocumented Archaeological Resources

Should previously unknown or unassessed deeply buried archaeological resources be uncovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*. Any person discovering human remains must immediately notify the police or coroner and the Registrar of Cemeteries, Ministry of Government and Consumer Services.

6.2.1 Barrie Corridor Specific Requirements

In addition, should any previously undocumented archaeological resources be uncovered along the Barrie Corridor during construction, Indigenous communities shall be notified in association with the following treaties:

- Toronto Purchase (Mississaugas of The New Credit),
- Williams Treaties (clause 2) (Alderville, Curve Lake, Hiawatha, Scugog Island, Beausoleil, Georgina Island, Rama), and
- Chippewa Treaty #18 of 1818 (Beausoleil, Georgina Island, Rama).

6.3 Discovery of Human Remains

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner.

6.4 Engagement with Indigenous Communities

Metrolinx will engage with Indigenous communities where possible when assessing the cultural heritage value or interest of specific site types (or presence of human remains) during Archaeological Assessments (e.g., Stage 2 and/or Stage 3 Archaeological Assessments), in accordance with the document *Engaging*

Aboriginal Communities in Archaeology: A Draft Technical Bulletin for Consultant Archaeologists, Section 1.

6.5 Stage 2 Archaeological Studies

Stage 2 Archaeological Assessment Studies will be undertaken prior to construction as detailed in the Stage 1 Archaeological Assessment Report contained in Appendix D and briefly summarized in **Table 6-1**

6.6 Stage 3 & 4 Archaeological Studies

Based on the results of the completed Stage 2 archaeological assessments, Stage 3 and/or 4 archaeological assessments will be carried out as required. Refer to **Table 6-1** for details.

Table 6-1: Summary of further archaeological assessment recommended

Study Corridor	OCS/Vegetation Zone and Facility Sites	Field Inspection	Archaeological Potential	Next Assessment Steps
Union Station Rail Corridor	OCS	No (no PTE or public access)	Yes (Possible Deeply Buried Wharf/Cribbing)	No Further Assessment: Stage 2 assessment or monitoring not practical nor likely informative
Lakeshore West	Mimico SWS	Yes (PTE)	No – Removed	No Further Assessment
	Mimico (Canpa) 25 kV Feeder Route (FR)	Yes (public access)	No – Removed	No Further Assessment
	Mimico Tap Location Mimico TPS	Yes (public access) Yes (public access)	Yes Yes	Stage 2 Test Pit Survey Stage 2 Test Pit Survey
	Oakville SWS	Yes (public access)	No – Removed	No Further Assessment
	Burlington Tap Location Burlington TPS	Yes (PTE) Yes (PTE)	Yes Yes (part) No (part) -- Removed	Stage 2 Test Pit Survey Stage 2 Test Pit Survey No Further Assessment
	OCS/Vegetation Zone	Yes (public access)	No – Removed along footprint and at bridges For Dunn, Dufferin, Dowling, Jameson and Drury bridges that have been identified for replacement: if during detailed design any impacts are anticipated that extend outside the disturbed OCS/Vegetation zone, then further	No Further Assessment Stage 1 and/or Stage 2 archaeological assessment; if required

Study Corridor	OCS/Vegetation Zone and Facility Sites	Field Inspection	Archaeological Potential	Next Assessment Steps
			archaeological assessment will be required to determine archaeological potential	
Kitchener	Bramalea PS	Yes (PTE)	Yes (part) No (part) -- Removed	Stage 2 Test Pit Survey No Further Assessment
	Bramalea 25 kV FR	Yes (public access)	No—Removed	No Further Assessment
	OCS/Vegetation Zone	Yes (public access)	No – Removed along footprint and at bridges (no bridge modifications anticipated)	No Further Assessment
Barrie	Maple PS	No (Stage 2 previously done)	Adjacent to Hope Primitive Methodist Cemetery	Stage 3 Cemetery Investigation if impacts are anticipated within 10 m of cemetery boundary
	Newmarket SWS	Yes (PTE and public access)	Yes No (part) – Removed	Stage 2 Test Pit Survey No Further Assessment
	Gilford PS	Yes (public access)	Yes	Stage 2 Test Pit Survey
	Preferred Allandale Tap Alternate Allandale Tap Allandale TPS	No (previously assessed) Yes (public access) Yes (PTE)	Yes Yes No--Removed	Stage 2 Test Pit Stage 2 Test Pit Survey No Further Assessment
	Barrie-Collingwood 25 kV Feeder Route	Yes (public access)	No – Removed	No Further Assessment
	OCS/Vegetation Zone	Yes (public access)	Yes (between Essa Road and Allandale GO Station adjacent to Allandale site BcGw-69) No—Removed at remainder and at bridges If during detailed design any bridge impacts are anticipated that extend outside the disturbed OCS/Vegetation zone, then further archaeological assessment will be	Stage 2 Test Pit Survey, Construction monitoring No Further Assessment Stage 1 and/or Stage 2 archaeological assessment; if required

Study Corridor	OCS/Vegetation Zone and Facility Sites	Field Inspection	Archaeological Potential	Next Assessment Steps
			required to determine archaeological potential	
Stouffville	Scarborough Tap Location Scarborough TPS	Yes (public access) Yes (public access)	Yes Yes (part) No (part) --Removed	Stage 2 Test Pit Survey Stage 2 Test Pit Survey No Further Assessment
	Scarborough 25 kV FR	Yes (public access)	No – Removed	No Further Assessment
	Unionville PS	Yes (public access)	Yes (part) No (part) – Removed	Stage 2 Pedestrian and Test Pit Survey No Further Assessment
	Lincolnville PS	Yes (public access)	Yes	Stage 2 Test Pit Survey
	OCS/Vegetation Zone	Yes (public access)	No – Removed along footprint and at bridges If during detailed design any bridge impacts are anticipated that extend outside the disturbed OCS/Vegetation zone, then further archaeological assessment will be required to determine archaeological potential	No Further Assessment Stage 1 and/or Stage 2 archaeological assessment; if required
Lakeshore East	Don Yard PS	No (previously assessed)	N/A	N/A
	Scarborough SWS	Yes (PTE and public access)	No – Removed	No Further Assessment
	Durham SWS	Yes (PTE and public access)	Yes (part) No (part) – Removed	Stage 2 TP Survey No Further Assessment
	ERMF Tap Location ERMF TPS	Yes (public access) No (previously assessed)	No – Low and wet N/A	No Further Assessment N/A
	OCS/Vegetation Zone	Yes (public access)	Yes- Adjacent site requires confirmation of disturbance	With respect to the Rodd Avenue area along the LSE corridor, a Stage 2 archaeological assessment was

Study Corridor	OCS/Vegetation Zone and Facility Sites	Field Inspection	Archaeological Potential	Next Assessment Steps
				previously completed and determined archaeological potential in the direct vicinity of the rail corridor; however within the rail ROW is disturbed and therefore there is no archeological potential. If during detail design it is determined that OCS/electrification infrastructure will be required outside of the MX owned right of way in this particular area and that subsequent ground disturbance is required within the established 20m buffer area (insert figure reference showing this 20m buffer area to Stage 1 AA report or Volume 3), a Stage 3 archaeological assessment will be undertaken prior to construction
			No – Removed along remainder of footprint and at bridges	No Further Assessment
			If during detailed design any bridge impacts are anticipated that extend outside the disturbed 7m OCS/Vegetation zone, then further archaeological assessment will be required to determine archaeological potential	Stage 1 and/or Stage 2 archaeological assessment; if required

6.7 Union Station Rail Corridor – Additional Archaeological Work

Based on the results of the archaeological work undertaken as part of the TPAP, no further monitoring activities and commitments are anticipated.

6.8 Lakeshore West Corridor– Additional Archaeological Work

Based on the results of the Stage 2 archaeological assessments, further Stage 3 archaeological assessment and/or Stage 4 mitigation will be conducted, as required, on any newly-discovered Indigenous or Euro-Canadian site determined to have Cultural Heritage Value or Interest (CHVI) that will be impacted by construction associated with the OCS footprint and facility sites.

6.9 Kitchener Corridor – Additional Archaeological Work

Based on the results of the archaeological work undertaken as part of the TPAP, no further monitoring activities and commitments are anticipated.

6.10 Barrie Corridor – Additional Archaeological Work

Based on the results of the Stage 2 archaeological assessments, further Stage 3 archaeological assessment and/or Stage 4 mitigation will be conducted, as required, on any newly-discovered Indigenous or Euro-Canadian site determined to have CHVI that will be impacted by construction associated with the OCS footprint and facility sites.

6.10.1 Maple PS

A Stage 2 archaeological assessment was previously conducted (2008) on a much larger parcel of land that includes the Maple PS facility site (see EPR Appendix D). Although three sites were located during the survey, none are within the proposed Maple PS facility limits nor recommended for further archaeological assessment. No further Stage 2 archaeological assessment is required, however it is noted that the property is adjacent to the historic Hope Primitive Methodist Cemetery. The proposed Maple PS site may therefore require a Stage 3 cemetery investigation if there are any planned project impacts within 10 metres of the cemetery limits (see **Figure 1-1**). This will be review and confirmed during detailed design of the PS facility and if required, the Stage 3 Archaeological Assessment will be completed prior to construction.

Figure 6-1: Maple PS and Location of Adjacent Cemetery

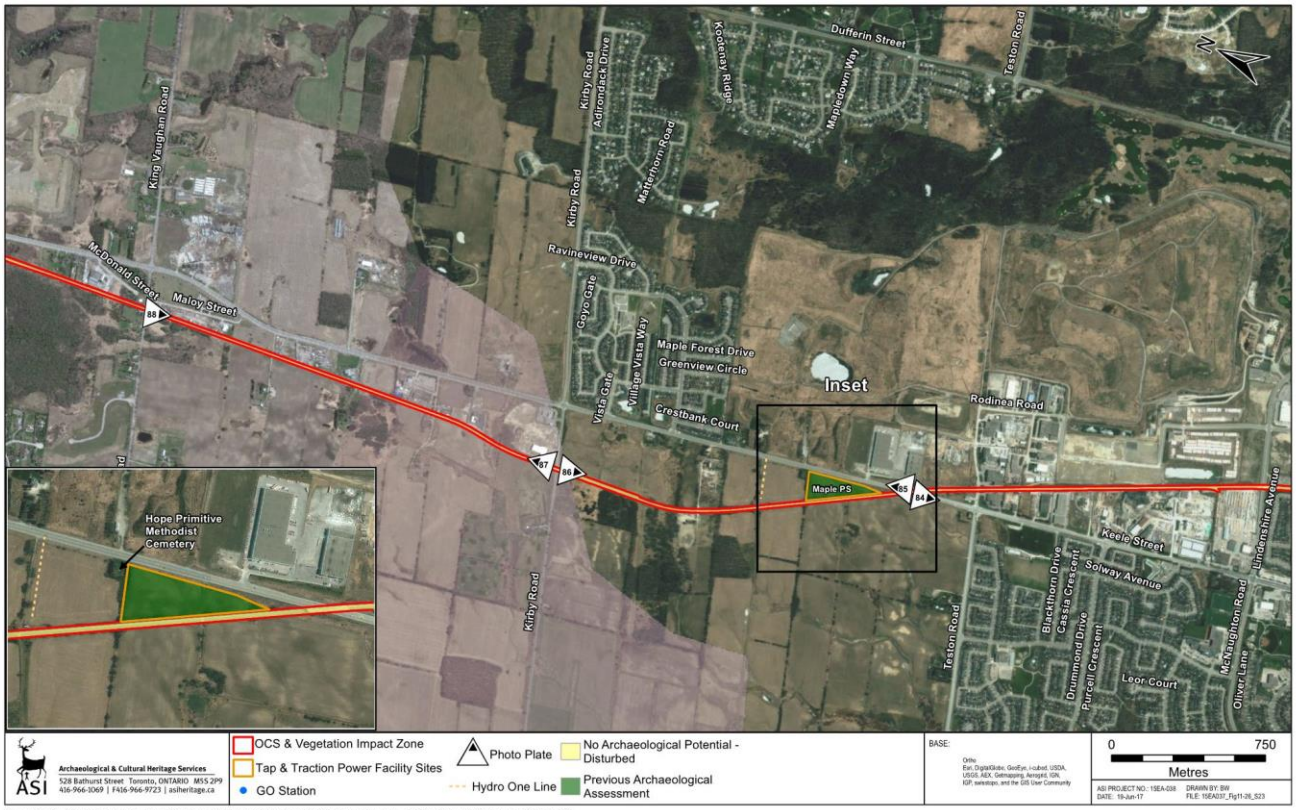


Figure 11-26: GO Rail Network Electrification TPAP Stage 1 Archaeological Assessment - BR Corridor, Field Results (Sheet 23)

6.10.2 Allandale site (BcGw-69)

Stage 4 archaeological mitigation will be implemented for any portion of the Allandale site (BcGw-69) to be impacted by construction associated with electrification (e.g., the OCS, 2X25 kV feeder route, etc.). This will be review and confirmed during detailed design and if required, the Stage 4 archaeological mitigation will be implemented.

6.11 Stouffville Corridor– Additional Archaeological Work

Based on the results of the Stage 2 archaeological assessments, further Stage 3 archaeological assessment and/or Stage 4 mitigation will be conducted, as required, on any newly-discovered Indigenous or Euro-Canadian site determined to have CHVI that will be impacted by construction associated with the OCS footprint and facility sites.

6.12 Lakeshore East Corridor– Additional Archaeological Work

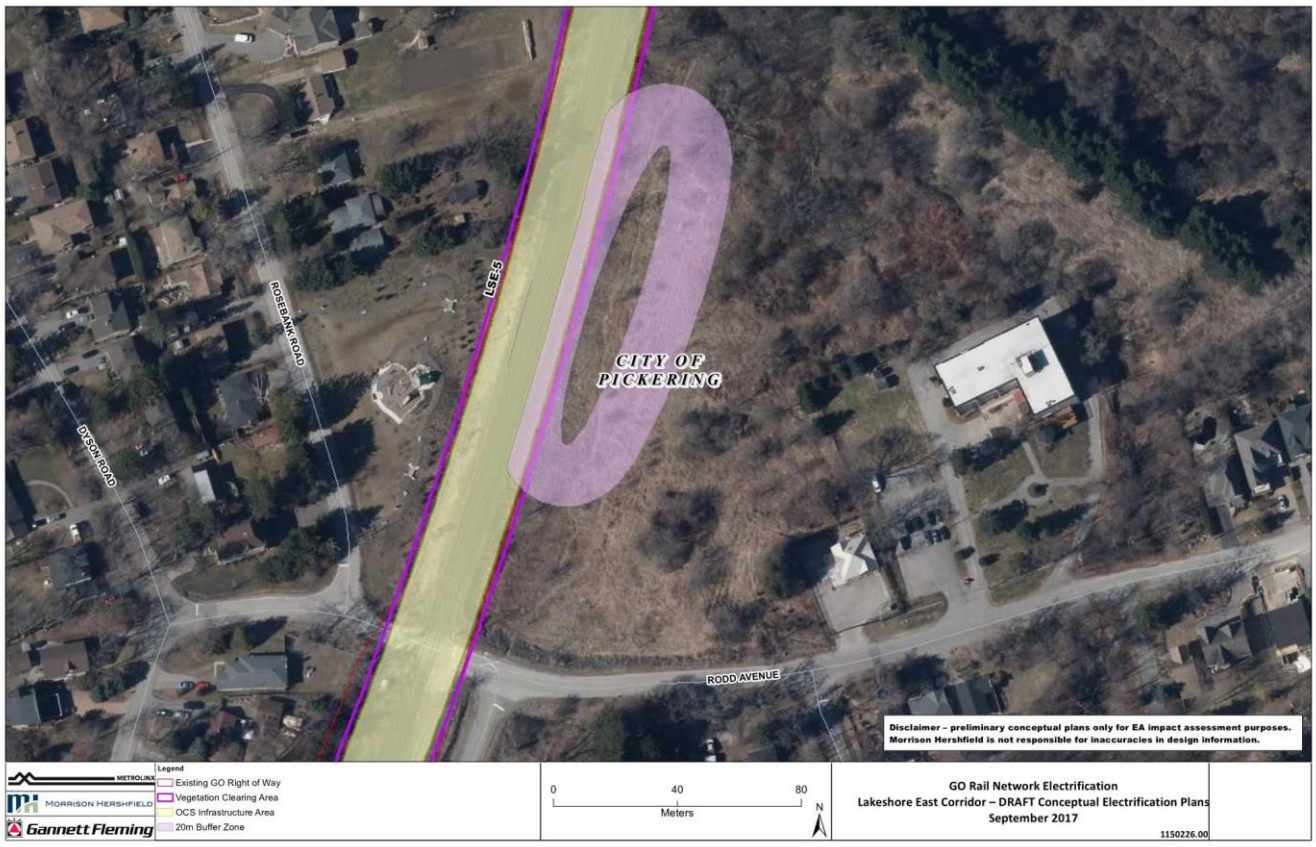
Based on the results of the Stage 2 archaeological assessments, further Stage 3 archaeological assessment and/or Stage 4 mitigation will be conducted, as required, on any newly-discovered Indigenous or Euro-

Canadian site determined to have CHVI that will be impacted by construction associated with the OCS footprint and facility sites.

6.12.1 Rodd Avenue Area

With respect to the Rodd Avenue area along the LSE corridor, a Stage 2 archaeological assessment was previously completed and determined archaeological potential in the direct vicinity of the rail corridor; however within the rail ROW is disturbed and therefore there is no archeological potential. If during detail design it is determined that OCS/electrification infrastructure will be required outside of the MX owned right of way in this particular area and that subsequent ground disturbance is required within the established 20m buffer area (see **Figure 1-2**), a Stage 3 archaeological assessment will be undertaken prior to construction.

Figure 6-2: Rodd Avenue Area and Approximate location of 20m Buffer



7 Natural Environment

7.1 General

The following general natural environmental mitigation measures will be adhered to and implemented:

- Implement all mitigation measures outlined in EPR Volume 3.
- An Environmental Inspector be present during construction activities in order to ensure that all environmental mitigation measures are properly installed, implemented and maintained;
- Further investigations may be required during detailed design in order to determine the boundaries of natural features associated with the Natural Heritage System (NHS) and within Designated Areas (ANSIs, PSWs), in consultation with MNRF, Toronto Region Conservation Authority (TRCA), Credit Valley Conservation Authority (CVC), Halton Region Conservation Authority (HRCA), Lake Simcoe Region Conservation Authority (LSRCA), and Central Lake Ontario Conservation Area (CLOCA) in order to accurately confirm/predict impacts to these sensitive areas and develop avoidance strategies and/or compensation for losses within these areas; 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 the *Metrolinx Tree/Vegetation Compensation Protocol* (refer to Section **7.5** below).

7.1.1 Construction Mitigation

Mitigation measures to reduce or mitigate the potential for adverse effects caused by construction activities include:

- Dust should be controlled as much as possible by watering of appropriate surfaces. The contractor shall adhere to relevant guidelines and Ontario Provincial Standard Specifications, including OPSS 506 (Dust Control);
- All construction equipment and vehicles will yield the right-of-way to wildlife, if it is safe to do so;
- Advise workers to perform visual survey of machinery and work area prior to commencing work since wildlife may be found basking or hiding on or under equipment, rocks, debris piles etc.;
- Do not allow construction debris to accumulate on-site and on the soils surface but regularly clean up the site to reduce the possibility of wildlife using debris piles for shelter;
- Clean up all litter daily and provide waste disposal containers so wildlife does not ingest indigestible materials or become entangled in debris;
- Any wildlife incidentally encountered during construction will be protected and will not be knowingly harmed; and
- Advise 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. and any

individuals found shall be left to move on their own or moved properly out of harm's way in the direction they were heading.

- Although no in-water works are anticipated to be required for bridge modifications over watercourses, if the construction approach changes as a result of detailed design, the Contractor shall abide by the requirements of applicable legislation including but not limited to:
  - Navigation Protection Act;
  - Fisheries Act (For any areas identified during Detailed Design that require in or near water works, a Self-Assessment under the Fisheries Act will be undertaken by a qualified professional to determine appropriate mitigation measures and to confirm whether further assessment and review is required by Fisheries and Oceans Canada);
  - A qualified Fisheries Specialist shall undertake an assessment to determine measures to avoid causing harm to fish and fish habitat, including aquatic species at risk and determine the need for Fisheries and Oceans Canada review;
  - All in-water works shall comply with the timing windows identified by MNRF as/if applicable; and
  - Compliance with OPSS 180 (Management of Excess Materials) and OPSS 182 (Environmental Protection for Construction in Waterbodies and on Waterbody Banks) during construction.

7.2 Vegetation Management – Construction Phase

The following mitigation measures are proposed in order to reduce or mitigate the potential for adverse effects on vegetation during construction:

- Adhere to relevant guidelines and Ontario Provincial Standard Specifications (OPSS) for clearing and grubbing, site preparation and tree protection;
- Existing vegetation that does not require removal will be protected by erecting and maintaining a temporary fence for tree protection, pruning interfering branches and treating with approved dressing, treating any damaged roots >25 mm in diameter with approved tree paint;
- Do not damage the root system, trunk or branches of any tree; if any roots are encountered during excavation, they shall be cut off cleanly;
- All exposed roots of trees to be retained shall be covered in a minimum of 5 cm of firm moist soil within 24 hours of exposure;
- Any exhaust fumes from all equipment shall not be directed towards any tree's canopy
- Branches that are likely to be damaged by construction equipment, should be removed before construction so that bark is not torn accidentally and wounds are not more extensive than absolutely necessary;
- Site specific Edge Management mitigation measures will be identified and implemented at Detailed Design, as required

- All pruning should be carried out according to accepted arboriculture practices by a Certified Arborist[5] or under the supervision of a Certified Arborist;
- Pruning activities will be carried out taking into consideration requirements and guidelines that may be applicable to local municipalities;
- Request and/or coordinate with private landowners for the felling or pruning of any tree, which is causing concern per *Metrolinx Tree/Vegetation Compensation Protocol*;
- Advise the landowner and/or occupiers of GO Transit-initiated tree pruning activities on trees overhanging or leaning over the railway corridor per *Metrolinx Tree/Vegetation Compensation Protocol*; and
- During the detailed design phase, Vegetation Management Plans will be developed and carried out for each electrified corridor/feeder route to minimize the potential effects related to vegetation and tree removals. These Vegetation Management Plans will consist of:
    - Detailed Tree Inventory (refer to Section **7.3**)
    - Tree Protection (refer to Section **7.4**)

7.3 Tree Inventories

During detailed design, Metrolinx will carry out detailed tree inventories/surveys for trees located outside of MX's rail ROW/property that will identify tree metrics in accordance with municipal permitting requirements. Reports will be prepared that will contain a plan which visually displays the information presented in the tree inventory, including other relevant information within the report including tree numbers.

7.4 Tree Protection

Detailed measures to protect retained adjacent trees will be implemented during construction. This will include establishing tree protection zone limits, compliance with any applicable municipal requirements, diagram of tree protection barrier type, tree protection measures, and construction storage and staging areas where information is available.

7.5 Implementation of Tree/Vegetation Compensation Protocol

As part of the TPAP, Metrolinx developed an initial approach to tree/vegetation compensation measures to offset the tree/vegetation removals that will be required as part of the Electrification undertaking and to support a sustainable and vibrant tree canopy across the region.

More broadly, Metrolinx consulted with Conservation Authorities and Municipalities to establish the initial components of the Metrolinx Tree/Vegetation Compensation Protocol; this consultation will continue beyond TPAP completion to finalise the Protocol, as appropriate. Once the Protocol is finalized,

[5] Certified by the International Society of Arboriculture (ISA).

it will be included in the Contract documents and implemented during detailed design/construction. The following outlines the draft elements of the Protocol that have been developed to date:

- **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 will be to reduce administrative permitting burden for trees along long stretches of rail corridor.
- **For Trees within Metrolinx Owned Property**: Metrolinx will develop 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 consult with Conservation Authorities and municipalities to develop the final compensation plan.
- **Conservation Authority Lands:** For vegetation removals within conservation authority (CA) lands, applicable removal and restoration requirements will be followed where applicable/required.
    - Within CA owned land, Metrolinx will follow CA compensation requirements.
    - For CA regulated lands that Metrolinx owns, the Metrolinx Tree/Vegetation Compensation strategy will apply.
    - For CA regulated lands that Metrolinx does not own, then applicable law will apply regarding permitting requirements, etc.
- **Federal Lands:** For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements will be followed.
- **Tree End-Use:** Metrolinx will develop options for the end use of trees removed from Metrolinx property e.g., reuse/recycling options.

7.6 Species At Risk

The following general mitigation measures will be implemented to protect Species at Risk:

- All workers should be provided 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, each work site shall be inspected for individual SAR and any individuals found shall be left to move on their own or moved properly out of harm's way in the direction they were heading;
- Report all Species at Risk sightings and encounters to the appropriate MNRF District office using the appropriate reporting form; and
- If a nesting snake or turtle is found the MNRF shall be notified immediately and a ten (10) meter buffer zone shall be flagged around the site and that area protected from harm during the nesting season (May 1 to August 31);

- Adherence to the breeding bird timing window for vegetation removals whenever possible (avoid vegetation clearing activities between April 1 to August 31);
- During construction, should vegetation removals be required within the migratory bird window of April 1 to August 31, a survey for migratory bird nests (including SAR) will be required prior to any vegetation removals.

7.6.1 Butternut

The presence/absence of Butternuts will be confirmed during Detail Design. Should any Butternuts be found during Detail Design, a health assessment (to be completed by a qualified Butternut Assessor) will be required for any pure butternuts and appropriate approvals under the ESA, 2007 obtained. Dependent on number of individuals found and their conditions, this may include a registration process or permit. Protective measures for any Butternuts within 50 metres of the construction footprint that do not need to be removed, shall be implemented

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 (i.e. Deciduous Forest [FOD], Mixed Forest [FOM], and Deciduous Swamp [SWD]) 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 during detailed design, consultation with the MNRF will be required to determine the appropriate approval or permitting requirements. Specifically as part of detailed design and permitting, the MNRF Bat Protocol will be discussed with MNRF in relation to applicability and preferred approach for any required permits/approval as it relates to the Electrification Project works. Any required 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 30 to September 1 and strictly cannot occur during the bat maternity period of June 1 to July 31. 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.

7.6.3 Barn Swallow

Prior to any bridge works, surveys to determine the presence/absence of barn swallow nests will be required. Where Barn Swallow nests are identified, consultation with the MNRF (i.e. completion of Notice of Activity registration) will be required.

7.6.4 Bank Swallow

There are no anticipated impacts to Bank Swallow except at the East Rail Maintenance Facility TPS and the Bank Swallow colony located within LSE-5 (from approximately Kingston Sub Mile 316.9 to 316.8). 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 related to all Tap/TPF sites and all rail corridors:

- 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).
- Following the Metrolinx LSE track expansion project, monitoring of the Bank Swallow colony located within LSE-5 (from approximately Kingston Sub Mile 316.9 to 316.8) should be conducted to determine any adverse effects. Results of this monitoring should be used to inform additional mitigation if required during Electrification construction activities.

In addition, the general mitigation measures to protect Species at Risk listed in Section **7.6** above will also be complied with/followed.

7.6.5 Eastern Meadowlark and Bobolink

Due to potential habitat within Agricultural land (AG) of Maple PS and Gilford PS, targeted SAR surveys will be required for grassland bird species. Should habitat of Eastern Meadowlark and Bobolink be confirmed, consultation with the MNRF, including the Notice of Activity registration or permit, will be required.

7.6.6 Redside Dace

Further consultation with the 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*.

7.6.7 Silver Shiner

Although there are no in-water works proposed as part of electrification and no adverse effects to Silver Shiner or their habitat are anticipated, this will be re-confirmed as part of detailed design and further consultation with the MNRF during Detail Design will be undertaken as/if appropriate regarding any potential permitting/approval requirements.

7.6.8 Migratory Bird Species

Where removal of vegetation and works on bridges cannot occur outside of the breeding bird window (April 1st to August 31st), consultation with Environment and Climate Change Canada's Canadian Wildlife Service office is required.

The following mitigation measures are proposed in order to reduce or mitigate the potential for adverse effects on birds and their nests:

- Vegetation shall be inspected for nests and eggs prior to maintenance activities;
- Nests and eggs of protected migratory birds shall not be destroyed during migratory bird nesting season (April 1st to August 31st) 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;
- During construction, should vegetation removals be required within the migratory bird window of April 1 to August 31, a survey for migratory bird nests (including SAR) will be required prior to any vegetation removals;
- Should vegetation removals be required within the period from April 1st to August 31st, a nesting survey protocol shall be developed and implemented prior to any vegetation removals;
- All active nests of birds protected by the MBCA shall not be removed at any time. If inactive nests are removed from structures prior to the breeding bird window (April 1st to August 31st), the bridge structure should be netted or tarped to prevent the recurrence of nesting activity, the bridge should be monitored daily for any new nests; and
- Nests and eggs of protected Species at Risk birds shall not be destroyed at any time.

7.6.9 Sediment and Erosion

Mitigation measures to reduce or mitigate the potential for adverse effects caused by sediment and erosion include:

- Adhere to relevant guidelines and Ontario Provincial Standard Specifications (OPSS) relating to proper sediment and erosion controls including consideration of TRCA[6] Erosion and Sediment Control Guidelines to Urban Construction), Ontario Provincial Standards Specifications (OPSS) – OPSS 577 (Erosion and Sediment Control Measures) and 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;

[6] *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.*

- 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 30m 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.

7.6.10 Spills

Mitigation measures to be adhered to relating to accidental spills and contamination of watercourses include:

- 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;
- Ensure spill kits are on-site at all times for implementation in the event of an accidental spill during construction;
- Operate, store and maintain all equipment and associated materials in a manner that prevents the entry of any deleterious substance to the waterbody;
- All mobile equipment will have drip pans installed and refueling will take place no closer than 30m to any study area watercourses or ditchlines in order to prevent water contamination due to accidental fuel spills;
- Fuel transport should be conducted in compliance with the Transportation of Dangerous Goods Act;
- All necessary precautions shall be implanted to prevent the spillage and release of hazardous materials to the environment;
- All leaks or spills to be immediately reported to the Ministry of the Environment and Climate Change (MOECC), Spills Action Centre at 1-800-268-6060;

- Use shrouding or debris platforms to trap and prevent concrete and other bridge materials from entering the watercourse during construction;
- The TPS facilities will be fully equipped with spill containment and oil/water separation facilities. In the event on an equipment failure, oily water will not escape from the site;
- Spill cleanup and response equipment will be located on site;
- Spill decks should be used for transferring products to smaller containers;
- Fire extinguishers should be located near petroleum, oil and lubricants storage areas; and
- Routine inspection of the facilities, including transformer oil should be carried out.

7.6.11 Invasive Species

The following mitigation measures will be followed to deal with invasive species:

- Where possible, excavated soils should be stored for a period of less than 45 days;
- Where excavated soils must be stored for a period longer than 45 days, they should be covered or seeded with a cover crop, such as annual oats or Canada Wild Rye;
- Once soils are replaced, they should be re-seeded with a native seed mix suited to the site conditions;
- Equipment should be cleaned between sites to prevent the spread of invasive species; and
- Vegetation removals of Ash trees must be carried out 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 Canadian Food Inspection Agency (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.
- The Canadian Food Inspection Agency has established a regulated area in parts of Mississauga and Toronto to prevent the spread of the Asian longhorned beetle, which includes a segment of the GO Kitchener corridor as identified in Appendix A. Vegetation removals within the Regulation Area for Asian Long-Horn Beetle 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.

8 Contaminated Soil/Groundwater

8.1 Additional Work - Rail Corridors/OCS Impact Zone

Based on the gap analysis study completed along the rail corridors as part of this TPAP, portions of the corridors within the study area have been assessed (approximately 55% of the OCS Impact Zone have received some form of Environmental Site Assessment (ESA)). However there are significant lengths of the corridors/OCS Impact Zone that have not been assessed based on the documentation reviewed to date. Generally these gaps are summarized as follows (refer to EPR Volume 2 for additional detail):

- **Union Station Rail Corridor** – The majority of this corridor has been the subject of Phase I and II ESAs with the exception of most of the Don Yard Layover. Two section of 0.8 km and 1 km require ESA work.
- **Lakeshore West Corridor** – This corridor has been the subject of Phase I and II ESA from Strachan Ave (eastern boundary of current study) to 29th St. (west of the Mimico TPS). The corridor west of this point has not been assessed. Approximately 37 km of this corridor have not been subject of ESA. Additional gaps include the Willowbrook Maintenance Facility..
- **Kitchener Corridor** – This corridor has been subject of a Phase I ESA and limited Phase II ESA from Highway 427 (the eastern boundary of the current study) to Highway 407. The corridor west of this point (to Steeles Ave.) has not been assessed, a length of approximately 2.7 km.
- **Barrie Corridor** - This corridor has been subject to very limited assessment work, consisting only of a Phase I ESA that extends from just north of Steeles Ave. up to Bradford, where the 9th Line crosses the corridor. The corridor both south and north of this segment has not been assessed, comprising approximately 48 km of corridor.
- **Stouffville Corridor** – Most of this corridor has been the subject of Phase I and II ESA. A short segment extending north from the Stouffville GO Station to Lincolnville has not been assessed, being approximately 3.7 km long. An additional gap is the segment of line south from Unionville Station to Denison St. which may not have been included in the Phase II ESA.
- **Lakeshore East Corridor** - This corridor has been the subject of Phase I and II ESA from the Don River (western boundary of current study) to Frenchman's Bay (west of Liverpool Rd.) in Pickering. The corridor east of this point (including the proposed switching yard at Durham (near Brock Road) has not been assessed. Approximately 20 km of this corridor have not been subject of ESA study.

Therefore further work is recommended along the corridors to assess for potential soil and/or groundwater contamination and develop appropriate mitigation measures. As a result additional Environmental Site Assessment studies including Phase I ESAs, Phase II ESAs, etc. will be carried out by Metrolinx as required along the corridors/OCS Impact Zone during the detailed design phase with respect to rail corridors to be electrified.

Furthermore, the mitigation measures as outlined in Section **8.3** below will be adhered to and implemented during detailed design and construction.

8.2 Additional Studies –Traction Power Facility Sites

The following additional studies will be carried out during the detailed design phase with respect to the Tap Sites, Traction Power Facility sites and associated ancillary components.

8.2.1 Tap Locations

Excess soil and ground water generated at the Tap sites will be analyzed for contaminants and will be disposed of in accordance with applicable legislation (i.e., *Ontario Environmental Protection Act Regulation 347*).

8.2.2 Traction Power Facilities - Phase I Environmental Site Assessments

If any properties are to be acquired by Metrolinx, Phase I Environmental Site Assessments (ESAs) are recommended for due diligence purposes prior to acquisition of the sites. Depending on the findings of the Phase I ESAs, further assessment (e.g., Phase II ESA(s)) may be required prior to acquisition.

8.2.3 Traction Power Facilities - Subsurface Investigations/Phase II Environmental Site Assessments

Complete a Subsurface Investigation or Phase II ESA as required at TPF locations and locations where ancillary works are proposed (e.g., underground duct banks, etc.) to assess the presence and quality of fill and potential impacts resulting from adjacent/nearby land uses and to assess for potential soil and/or groundwater contamination at the sites. Both a Limited Subsurface Investigation and a Phase II ESA would involve the collection of soil, groundwater and/or sediment samples from areas of identified potential concern to assess the presence and, where required, delineate the extent of subsurface contamination.

- A Limited Subsurface Investigation is similar to a Phase II ESA but may use the information from this EPR as appropriate (i.e., the identified contamination-related concerns) to develop the scope of the investigation.
- A Phase II ESA would use the information obtained from the Phase I ESA (as well as this report) to develop the scope of the investigation.
- Should these further assessments confirm the presence of subsurface contamination at these sites, recommendations for mitigation will be developed and implemented as appropriate.
- For the 2X25kV feeder routes associated with the Lakeshore West, Kitchener, Barrie, Stouffville and Lakeshore East corridors, the characterization of soil disturbed during the installation of the feeder routes can be assessed at the time of construction. The characterization, construction procedures and soil management requirements can be set out as part of a construction management plan.

8.3 General Mitigation Measures

In addition, the following mitigation measures will be adhered to and implemented at all Tap and TPF sites (including ancillary components such as access roads, gantries, etc.) and along rail corridors:

- 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*).
- Remediation and/or implementation of management measures to address contaminated soils and/or groundwater during construction and long term operations and maintenance if required/applicable. Management measures will be carried out in accordance with applicable environmental legislation.
- Implement a site specific health and safety plan for construction workers based on the findings of the subsurface investigations.
- Develop and implement an Excess Materials Management Plan based on the findings of the limited subsurface investigations. The Plan will be available on site during construction.
- Prepare and implement a dust management plan for construction activities based on industry best practice to mitigate impacts through the use of proper controls such as (in addition to the controls already mentioned in the report):
    - Periodic watering of unpaved (non-vegetated) areas;
    - Seeding/re-vegetating exposed soil;
    - Periodic watering of stockpiles;
    - Limiting the speed of construction vehicular travel;
    - Covering trucks hauling excess material;
    - Sweeping and/or water flushing of the entrances to the construction zones; and
    - Installing silt fences around site perimeter to prevent dust migration.
- Mitigation measures detailed in “Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities (Cheminfo Services, March 2005)” will be implemented, where practical.
- Implement spill management measures as indicated in the Emergency Preparedness and Response Plan.
- Although there may be some lubricants and/or fluids associated with construction vehicles and equipment, it is inferred that the equipment will be designed and operated to prevent leaks and thus the potential for contamination is unlikely. In the unlikely event that soil and/or groundwater contamination did occur, proposed mitigation options would include the following:
    - Follow procedures outlined in the Emergency Preparedness Plan;

- Spill kits will be available on vehicles and in potential spill locations;
- Spills will be cleaned up as soon as possible and remediation activates will be conducted if necessary;
- Each site will be equipped with spill containment and/or oil/water separator facilities.

9 Stormwater Management

Based on the SWM assessment undertaken as part of the TPAP and consultation with Conservation Authorities (CA), there are six Tap/TPF sites that fall partially within CA Regulated Areas and one TPF site that is situated entirely within a CA Regulated Area (see **Table 1-4**). As detailed in Volume 1 of this EPR, 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 will be developed during detailed design in consultation with Conservation Authorities and other applicable review agencies, as appropriate.

Table 9-1: Summary of Taps/TPFs in Regulated areas

Conservation Authority	Site	Watershed	Sub-Watershed	Within regulated area[7]?
CLOCA	East Rail Maintenance Facility Tap/Tps	Corbett Creek	West Corbett Creek	Yes – portion of the site is in a regulated area
HRCA	Burlington Tap/Tps	Burlington Urban Creek	Between Roseland Creek & Tuck Creek	No
HRCA	Oakville Sws	Oakville East Urban Creeks	Joshua's Creek	No
LSRCA	Preferred Allandale Tap	Barrie Creeks	HotchKiss Creek	Yes – portion of the site is in a regulated area
LSRCA	Alternate Allandale Tap	Barrie Creeks	HotchKiss Creek	No
LSRCA	Allandale Tps	Barrie Creeks	HotchKiss Creek	No
LSRCA	Gilford Ps	Innisfil Creeks	Gilford Creek	Yes – portion of the site is in a regulated area
LSRCA	Newmarket Sws	East Holland River	Weslie Creek	No
TRCA	Mimico Tap/Tps	Lake Ontario Waterfront	Between ETOB / MIM	No
TRCA	Mimico Sws	Lake Ontario Waterfront	Between ETOB / MIM	No
TRCA	Bramalea Ps	Etobicoke Creek	Spring Creek (Etob. 25/26/28A)	Yes – portion of the site is in a regulated area

[7] Based on information available at the time of preparing the GO Rail Network Electrification EPR.

Conservation Authority	Site	Watershed	Sub-Watershed	Within regulated area[7]?
TRCA	Maple Ps	Don River	Don East (23W)	No
TRCA	Scarborough Tap/Tps	Highland Creek	HIG14	Yes – portion of the site is in a regulated area
TRCA	Unionville Ps	Rouge River	ROU69/53	No
TRCA	Lincolnville Ps	Duffins Creek	DUF45(East)	Yes – portion of the site is in a regulated area
TRCA	Durham Sws	Duffins Creek / Krosno Creek	KRO2 / DUF6	No
TRCA	Scarborough Sws	Don River	DON M3/M4	No
TRCA	Don Yard Ps	Don River	DON1	Yes - site is situated in a regulated area

9.1 Traction Power Facility Design Commitments (SWM)

The following additional studies/work/commitments will be carried out and adhered to during detailed design with respect to stormwater management (SWM):

- During detailed design, a more detailed Stormwater Management Plan and Design will be carried out and implemented by Metrolinx in accordance with the Ministry of the Environment's Stormwater Management Planning and Design Manual (2003) and will address quantity control, erosion control, and quality control:
    - A more detailed analysis for the quantity, quality, erosion control and water balance will be required at detailed design stage.
    - The proposed development areas for each Tap and Traction Power Facility and their locations used in the preliminary SWM assessment as documented in Volume 3 were based on conceptual design; therefore reassessment of the drainage areas will be required at the subsequent detailed design stage.
- For facilities to be located within the CA Regulated Areas, these sites will be investigated further, for flood elevations, floodproofing and cut and fill balance within the flood plain, during the detail design stage. Relevant CAs will be contacted to collaborate design and approvals during detailed design, as appropriate.
- Flow contribution to the existing ditches, culverts and storm sewer and their capacities will be further investigated at detail design stage.
- Municipal data for the existing infra structure downstream and any approvals (if required) for discharging runoff from the development sites to the existing drainage system downstream will be obtained at detail design stage.
- Computations for the design of bio-swale would be done at the detailed design stage.

- The stormwater management plan/design will be developed in consultation with Conservation Authorities and other applicable review agencies, as appropriate.
- Each tap/traction power facility 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 Tap/TPF sites, the facilities will be built 0.3m above the floodplain.
- Where sensitive/endangered fish/fish habitat may be identified near the Tap/TPF sites 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.
- With regard to the Scarborough TPS final design, coordination between Hydro One and Metrolinx will be undertaken regarding further assessment of any potential conflicts relating to the existing Hydro One Transformer Station's spill containment and storm drainage system.
- Implement the stormwater management plan/design prior to commencing operation of the GO Rail Network Electrification project.

10 Noise

10.1 Operational Noise – Train Service

In accordance with the GO Rail Network Electrification Noise and Vibration Modelling Reports contained in Appendix G and the MOEE/GO Transit Noise Protocol, Metrolinx will adhere to the following commitments:

- Consider mitigation if the project is expected to cause a 5 dB increase or greater in the average noise (referred to as "Leq") relative to the existing noise level or the MOE objectives of 55 dBA for daytime and 50 dBA for night-time
- Undertake further analysis of noise mitigation options during detailed design to establish what types of mitigation will be implemented and where. This will include further consideration of the administrative, operational, economic and technical feasibility as per the Protocol.
- Mitigation should be implemented where technically feasible. At the Detailed Design phase, other considerations, such as engineering, economic and administrative feasibility should be evaluated.
- Implement noise mitigation if the measures are determined to be administratively, operationally, economically and technically feasible in accordance with the Protocol.
- If deemed feasible, the mitigation measures shall ensure that the predicted sound level from the GO Transit rail project is as close to, or lower than, the rail service objective.

10.1.1 Future/Committed Land Use

As per the 1995 MOEE / GO Transit Protocol, noise and vibration impacts are evaluated at lands which have been committed for (future) sensitive land uses. Committed uses beyond existing developments include: approved site plans, approved condominium plans or draft approved plans of subdivision. As part of carrying out the noise/vibration modelling work, this data was requested from the municipalities located within the Electrification TPAP study area. It should be noted that the only data that was available/provided was from the City of Toronto for approved building permits for new residential uses, therefore this data was reviewed and included in the assessment. Modelling was completed for all receptors identified through review of this data; results are presented for selected representative receptors.

For those sections of the corridor outside of the City of Toronto, a screening level assessment was conducted based on the limited detail provided in the available data on planned developments provided for municipalities other than the City of Toronto. The screening level assessment was designed to flag potential planned areas of development that may experience Adjusted Noise Impacts of greater than 5 dB based on the limited information available. This assessment was completed for the Electric RER scenario only and does not include the investigation of barriers within these areas. Notwithstanding this, the reports contained in EPR Appendix G include figures showing flagged potential planned areas of (future) development that were provided by their respective municipalities.

The following commitments will be adhered to:

- Metrolinx will use this information for consideration of noise mitigation for new planned developments (if approved by the relevant municipalities) during the detail design stage as appropriate.
- Metrolinx will consider new approved development information that was not readily available when requested at the time of writing the reports contained in Appendix G, as it is received from the various municipalities. The noise assessment will be updated as required during detailed design to reflect relevant/new development data.

10.1.2 Future Public Consultation

Metrolinx will carry out additional public engagement, as appropriate, regarding proposed noise mitigation solutions once detailed design has progressed.

10.1.3 Union Station Rail Corridor

Based on the noise modelling assessment completed (see Appendix G), there were no adjusted noise impacts associated with USRC in the Electric RER scenario that were deemed to be Significant (i.e., 5 dB increase or greater). As all Adjusted Noise Impacts for the Electric RER scenario were predicted to be not significant (i.e. there was less than 5 dB increase); therefore investigation of noise mitigation was not required, as per the MOEE/GO Protocol.

10.1.4 Lakeshore West Corridor

Based on the noise modelling assessment completed (see Appendix G), there were no adjusted noise impacts associated with USRC in the Electric RER scenario that were deemed to be Significant (i.e., 5 dB increase or greater). As all Adjusted Noise Impacts for the Electric RER scenario were predicted to be not significant (i.e. there was less than 5 dB increase); therefore investigation of noise mitigation was not required, as per the MOEE/GO Protocol.

10.1.5 Kitchener Corridor

Based on the noise modelling assessment completed (see Appendix G), there were no adjusted noise impacts associated with USRC in the Electric RER scenario that were deemed to be Significant (i.e., 5 dB increase or greater). As all Adjusted Noise Impacts for the Electric RER scenario were predicted to be not significant (i.e. there was less than 5 dB increase); therefore investigation of noise mitigation was not required, as per the MOEE/GO Protocol.

10.1.5.1 Retained Barriers

The noise barriers that were recommended as a result of the *original assessment* were retained as part of the proposed mitigation. The locations of these barriers are shown as orange coloured lines/symbols shown on the *Kitchener Corridor EPR Appendix S Maps*. The *original assessment* is defined as the previously completed noise assessment reflecting the electric locomotive train type defined mathematically within Cadna/A with a "K" constant that differed from the "K" constant defined in the FTA mode as described above.

During detailed design, retained noise barriers along the Kitchener corridor will be further reviewed to determine the administrative, operational, economic and technical feasibility and to further define what type of mitigation will be implemented (if applicable).

10.1.6 Barrie Corridor

Based on the noise modelling assessment completed (see Appendix G):

- 63 nighttime Adjusted Noise Impacts were deemed to be Significant (i.e., between 5 and 9.99 dB increase); and
- 19 nighttime Adjusted Noise Impacts were deemed to be Very Significant (i.e., greater than 10 dB increase).

Mitigation measures were investigated for all points of receptors with a Significant or Very Significant Adjusted Noise Impact (i.e., 5 dB increase or greater) in accordance with the MOEE/GO Protocol. The Adjusted Noise Impacts were predicted to be Significant or greater for 88 receptors.

10.1.6.1 Retained Barriers

The noise barriers that were recommended as a result of the *original assessment* were retained as part of the proposed mitigation. The locations of these barriers are shown as orange coloured lines/symbols shown on the *Kitchener Corridor EPR Appendix S Maps*. The *original assessment* is defined as the previously completed noise assessment reflecting the electric locomotive train type defined mathematically within Cadna/A with a "K" constant that differed from the "K" constant defined in the FTA mode as described above.

During detailed design, noise barriers identified as technically feasible as well as retained noise barriers along the Barrie corridor will be further reviewed to determine the administrative, operational, economic and technical feasibility and to further define what type of mitigation will be implemented (if applicable).

10.1.7 Stouffville Corridor

Based on the noise modelling assessment completed (see Appendix G):

- 32 nighttime Adjusted Noise Impacts were deemed to be Significant (i.e., between 5 and 9.99 dB increase); and
- 11 nighttime Adjusted Noise Impacts were deemed to be Very Significant (i.e., greater than 10 dB increase);

Mitigation measures were investigated for all points of receptors with a Significant or Very Significant Adjusted Noise Impact (i.e., 5 dB increase or greater) in accordance with the MOEE/GO Protocol. The Adjusted Noise Impacts were predicted to be Significant or greater for 88 receptors.

10.1.7.1 Retained Barriers

The noise barriers that were recommended as a result of the *original assessment* were retained as part of the proposed mitigation. The locations of these barriers are shown as orange coloured lines/symbols shown on the *Kitchener Corridor EPR Appendix S Maps*. The *original assessment* is defined as the previously completed noise assessment reflecting the electric locomotive train type defined mathematically within Cadna/A with a "K" constant that differed from the "K" constant defined in the FTA mode as described above.

During detailed design, noise barriers identified as technically feasible as well as retained noise barriers along the Stouffville corridor will be further reviewed to determine the administrative, operational, economic and technical feasibility and to further define what type of mitigation will be implemented (if applicable).

10.1.8 Lakeshore East Corridor

Based on the noise modelling assessment completed (see Appendix G):

- 29 nighttime Adjusted Noise Impacts were deemed to be Significant (i.e., between 5 and 9.99 dB increase).

Mitigation measures were investigated for all points of receptors with a Significant or Very Significant Adjusted Noise Impact (i.e., 5 dB increase or greater) in accordance with the MOEE/GO Protocol. The Adjusted Noise Impacts were predicted to be Significant or greater for 88 receptors.

10.1.8.1 Retained Barriers

The noise barriers that were recommended as a result of the *original assessment* were retained as part of the proposed mitigation. The locations of these barriers are shown as orange coloured lines/symbols shown on the *Kitchener Corridor EPR Appendix S Maps*. The *original assessment* is defined as the previously completed noise assessment reflecting the electric locomotive train type defined mathematically within Cadna/A with a "K" constant that differed from the "K" constant defined in the FTA mode as described above.

During detailed design, noise barriers identified as technically feasible as well as retained noise barriers along the Lakeshore East corridor will be further reviewed to determine the administrative, operational, economic and technical feasibility and to further define what type of mitigation will be implemented (if applicable).

10.2 Operational Noise – Traction Power Facilities

In the case of traction power facilities, noise impacts were expressed in terms of maximum daytime and nighttime 1-hour equivalent sound levels and were compared to applicable limits, as set out in the MOECC's Environmental Noise Guideline, NPC-300 (see Appendix G).

10.2.1 Union Station Rail Corridor

There are no traction power facilities proposed within the Union Station Rail Corridor.

10.2.2 Lakeshore West Corridor

The predicted noise impacts from the traction power facilities at nearby receptors were below the limits. Therefore, noise mitigation recommendations for traction power facility stationary sources are not required.

10.2.3 Kitchener Corridor

The predicted noise impacts from the traction power facility at nearby receptors were below the limits. Therefore, noise mitigation measures for traction power facility stationary sources are not required.

10.2.4 Barrie Corridor

The predicted noise impacts from the traction power facilities at nearby receptors were below the MOECC applicable exclusion limits, with exception of:

- Daytime, evening and/or nighttime predicted noise impacts of the Gilford PS at the façade and outdoor area of the residences represented by receptors R101, R102 and R103 are above the corresponding exclusion limits.

Evaluation of more accurate sound levels for transformers and, if necessary, mitigation measures such as low noise fans or barriers should be investigated for the Gilford PS location during Detailed Design.

10.2.5 Stouffville Corridor

The predicted noise impacts from the traction power facilities at nearby receptors were below the MOECC applicable exclusion limits, with exception of:

- One representative receptor (R11): the nighttime predicted noise impacts of the Scarborough Tap/TPS at the façade of the nearby representative receptor are 46 dBA, which is above the 45 dBA nighttime exclusion limit.

Evaluation of more accurate sound levels for transformers and, if necessary, mitigation measures such as low noise fans or barriers should be investigated for the Scarborough Tap/TPS location during Detailed Design.

10.2.6 Lakeshore East Corridor

The predicted noise impacts from the traction power facilities at nearby receptors were below the limits. Therefore, noise mitigation recommendations for traction power facility stationary sources are not required.

10.3 Construction Noise

To minimize the potential for construction noise impacts, the following mitigation measures will be considered and implemented by the Contractor during construction where possible:

- When possible, construction should be limited to the time periods allowed by the locally applicable bylaws (generally during the daytime hours and during weekdays). Certain type 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. As part of the electrification construction activities, nighttime work may be required. Although Metrolinx is exempt from municipal noise control bylaws that place limits on the timing of construction activity, Metrolinx (and their Contractor) will strive to adhere to such bylaws by limiting nighttime noisy activities wherever practical.
- All equipment should be properly maintained to limit noise emissions. As such, all construction equipment should be operated with effective muffling devices that are in good working order.
- The Contract documents should contain a provision that any initial noise complaint will trigger verification that the general noise control measures agreed to be in effect.

- In the presence of persistent noise complaints, all construction equipment should be verified to comply with MOECC NPC-115 guidelines.
- In the presence of persistent complaints and subject to the results of a field investigation, alternative noise control measured may be required, where reasonably available. In selecting appropriate noise control and mitigation measures, consideration should be given to the technical, engineering and economic feasibility of the various alternatives.

11 Vibration

11.1 Operational Vibration – Train Service

The vibration assessment undertaken as part of the TPAP focused on the change between the existing vibration levels and the future vibration levels, as per the MOEE/GO Transit Draft Protocol for Noise and Vibration Assessment. The subsections that follow outline which locations along each rail corridor where vibration mitigation will be considered.

In addition to the corridor specific vibration mitigation measure and commitments outlined below, the following general commitments will be adhered to as it relates to mitigating operational vibration impacts:

- The vibration assessment will be reviewed and updated during detailed design, including carrying out existing vibration measurements along the corridors for new infrastructure at relevant representative locations and a reasonable number of additional reasonable representative receptor locations to validate the need for vibration mitigation measures.
- The vibration assessment will be reviewed and updated during detailed design to identify alternative options for mitigation vibration and a preferred form of vibration mitigation will be identified including rationale for why it is preferred. The preferred mitigation will be implemented.

11.1.1 Union Station Rail Corridor

Within the Union Station Rail Corridor, it was identified that receptor R09 is the closest receptor to the addition of track E0 spanning from the Don Yard to Jarvis Street; therefore, the vibration assessment focused on this receptor. There are no receptors near the Don Yard track addition (i.e., E6 and E7); therefore, changes in vibration levels due to that track addition were not evaluated. The figures contained in **Appendix S** show the receptors associated with the Union Station Rail Corridor.

In the case of receptor R09, the threshold is exceeded during pass-bys of both GO trains and freight trains. Mitigation such as ballast mats, under sleeper pads or resilient fixation should be investigated for all the receptors with similar conditions (i.e., 18 metre distance to proposed new tracks) as the evaluated receptors. The approximate locations of trackwork and switches requiring mitigation are presented in **Appendix S**. The recommended vibration mitigation is identified as ballast mats though consideration to other mitigation options, such as under sleeper pads or resilient fixation will be assessed at the detailed design stage.

11.1.2 akeshore West Corridor

Within the Lakeshore West Corridor, it was identified that receptor R01, near the future/additional track between Strachan Avenue and Exhibition GO Station, was the closest receptor to the change; therefore, the vibration assessment focused on the Vibration Adjusted Impacts at R01.

Changes in the anticipated vibration levels for the selected receptor (R01) were calculated using the existing and future vibration levels for GO train, passenger train and freight train traffic using the FTA model. Neither, the existing or future vibration levels at the receptor near the track upgrade exceed the lowest MOEE/GO Protocol objective of 0.14 mm/s; and therefore, mitigation has not been recommended.

11.1.3 Kitchener Corridor

Within the Kitchener Corridor, It was identified that receptor R13 was the closest receptor to the addition of track; other representative receptors (R30, R36 and R45) were chosen to assess impacts at various distances from the existing and future outer track. The vibration assessment focused on the Adjusted Vibration Impacts at the aforementioned receptors.

Neither, the existing and nor future vibration for GO Train traffic at the nearest receptor near the track upgrade were predicted to exceed the lowest MOEE/GO Protocol objective of 0.14 mm/s; and therefore, mitigation has not been recommended.

The approximate locations of trackwork and switches requiring mitigation are presented in **Appendix S**. The recommended vibration mitigation is identified as ballast mats though consideration to other mitigation options, such as under sleeper pads or resilient fixation will be assessed at the detailed design stage.

11.1.4 Barrie Corridor

Within the Barrie Corridor, it was identified that receptors R015 and R032, near proposed new switches, and receptors R014, R027, R039 and R049, near proposed new track, were the closest receptors to a change in the track configuration that could affect vibration levels; therefore, the vibration assessment focused on these seven receptors.

The predicted change in vibration level between existing conditions and future conditions is in excess of the 25% increase threshold set out in the MOEE/GO Protocol, at all of the identified receptors except R027. In the case of receptors R015 and R032, the threshold is exceeded during pass-bys of both GO Trains and freight trains. In the case of receptors R014, R039 and R014, the threshold is exceeding only during freight pass-bys. Mitigation such as ballast mats, under sleeper pads or resilient fixation should be investigated for all receptors with similar conditions (i.e., 75 metre distance to proposed new switches or other special track work, or 20-25 metre distance to proposed new tracks) as the evaluated receptors. The approximate locations of trackwork and switches requiring mitigation are presented in **Appendix S**. The recommended vibration mitigation is identified as ballast mats though consideration to other

mitigation options, such as under sleeper pads or resilient fixation will be assessed at the detailed design stage.

11.1.5 Stouffville Corridor

Within the Stouffville Corridor, it was identified that receptors R06, R09 and R14, near proposed new switches, and receptors R22 and R24, near proposed new track, were the closest receptors to a change in the track configuration that could affect vibration levels; therefore, the vibration assessment focused on these five receptors.

For both GO train traffic and freight train traffic passing over a new switch, the increase in predicted vibrations levels is in excess of the 25% increase threshold for R06, R09 and R14. The exceedance of the objective at these three receptors is caused by the nearby (i.e., less than 40 metres away from the receptors) addition of a special trackwork rail component (i.e., switch). Mitigation such as ballast mats, under sleeper pads or resilient fixation should be investigated for all receptors with similar conditions (i.e., 40 metre distance to proposed special trackwork). The approximate locations of trackwork and switches requiring mitigation are presented in **Appendix S**. The recommended vibration mitigation is identified as ballast mats though consideration to other mitigation options, such as under sleeper pads or resilient fixation will be assessed at the detailed design stage.

Neither, the existing and future vibration levels for GO Train or freight train traffic at the receptor near the addition of track, such as R22 and R24, exceed the MOEE/GO Protocol objective of 0.14 mm/s or existing vibration levels; and therefore, mitigation was not investigated.

11.1.6 Lakeshore East Corridor

Within the Lakeshore East corridor, receptors R021B, R023B, R037B and R043, near proposed new switches, and receptors R013, R027, R031 and R077, near proposed new track, were the closest receptors to a change in the track configuration that could affect vibration levels; therefore, the vibration assessment focused on these seven receptors.

The predicted change in vibration level between existing conditions and future conditions is in excess of the 25% increase threshold set out in the MOEE/GO Protocol, at all of the identified receptors except R027 and R031. In the case of receptors R021B and R023B, the threshold is exceeded during pass-bys of GO trains, other passenger trains and freight trains. In the case of receptors R037B and R043, the threshold is exceeded during pass-bys of GO trains and freight trains. In the case of R013 and R077, the threshold is exceeded during freight pass-bys only. The approximate locations of trackwork and switches requiring mitigation are presented in **Appendix S**. The recommended vibration mitigation is identified as ballast mats though consideration to other mitigation options, such as under sleeper pads or resilient fixation will be assessed at the detailed design stage.

11.2 Construction Vibration

Vibration levels have the potential to cause annoyance at nearby residences that are within 45 metres of construction activities (i.e., the vibration levels are greater than 0.4 mm/s), but are predicted to remain below 3 mm/s PPV at all locations greater than 15 metres from the construction vibration source. Therefore, the zone of influence for annoyance is 45 metres and the zone of influence for building damage is 15 metres.

Mitigation Measures

- Metrolinx Community Relations staff will communicate construction work and respond to inquiries from residents and businesses;
- A proactive communications protocol is recommended that would advise residents in advance of nighttime construction.
- When possible, construction should be limited to the time periods allowed by the locally applicable bylaws (generally during the daytime hours and during weekdays). Certain type 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. As part of the electrification construction activities, nighttime work may be required. Although Metrolinx is exempt from municipal noise control by-laws that place limits on the timing of construction activity, Metrolinx (and their Contractor) will strive to adhere to such bylaws by limiting nighttime noisy activities wherever practical.
- All construction equipment should be verified to comply with MOE NPC-115 guidelines;
- A more detailed vibration assessment of construction be completed when the specifics of construction equipment are finalized prior to the commencement of construction. This assessment should consider minimizing construction vibration levels, while balancing construction schedules and expediting construction activity;
- Pre-condition surveys for properties within the zone of influence of the planned work will be completed to establish the property condition and set a baseline prior to any work beginning.
- Consideration should be given to monitoring of vibration during vibration intensive activities, to confirm that levels do not approach those required for structural damage;
- In the presence of persistent complaints and subject to the results of a field investigation, alternative vibration control measures may be required, where reasonably available. In selecting appropriate vibration control and mitigation measures, consideration should be given to the technical, administrative and economic feasibility of the various alternatives;
- Damages to building may result when these activities occur within 15 m. It is recommended that a 15 m setback distance between the construction vibration source and nearby buildings be implemented where possible. If not possible, then the vibration levels associated with the activity should be monitored.

12 Visual/Aesthetics

Based on the Visual Impact Assessment study and conceptual design prepared (refer to Appendix H for further detail) as part of the TPAP, areas of special aesthetic consideration were identified. These areas were classified as high or moderate visual impact areas along the rail corridors as well as certain traction power facility sites that were deemed to be situated in areas with sensitive views, 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 as much as possible.

12.1 Areas along Rail Corridors

Areas classified as high or moderate potential visual impact areas along the rail corridors through the Visual Impact Assessment Report (see Appendix H) have been summarized in **Table 12-1.**

Table 12-1: Areas of special visual/aesthetic consideration Along rail corridors

Project Component	High Potential Visual Impact	Moderate Potential Visual Impact
Union Station Rail Corridor (USRC)	• GO Stations with visual integrity ○ Union Station (See Map A-1 in EPR Appendix H)	• Residential areas where homes are between 8 and 20 metres from the railroad ROW (see Maps A-1, A-2 in EPR Appendix H)

Lakeshore West Corridor (LSW)	• Residential areas where homes are less than 8 metres from the railroad ROW (see Maps B-12 to B-14 in EPR Appendix H)	• Residential areas where homes are between 8 and 20 metres from the railroad ROW (see Maps B-7, B-8, B-9, B-10, B-14 and B-15 in ERP Appendix H)
		• Scenic Areas
		  ○ Memorial Park (see Map B-11 in EPR Appendix H)
		• Scenic overpasses
		  ○ Etobicoke Creek (see Map B-7 in EPR Appendix H)
		  ○ Credit River (see Map B-11 in EPR Appendix H)
		  ○ Sixteen Mile Creek (see Map B-21 in EPR Appendix H)
		• Bridges with interesting or scenic views:
		  ○ Strachan Avenue (See Map B-1 in EPR Appendix H)
		  ○ Dufferin Street (See Map B-1 in EPR Appendix H)
		  ○ Islington Avenue (See Map B-5 in EPR Appendix H)
		• Pedestrian bridges
		  ○ Sunnyside (See Map B-2 in EPR Appendix H)

Project Component	High Potential Visual Impact	Moderate Potential Visual Impact
		○ Drury Lane (See Map B-31 in EPR Appendix H)
Kitchener Corridor (KT)	• None	• Residential areas where homes are between 8 and 20 metres from the railroad ROW (See Map C-2 in EPR Appendix H)
Barrie Corridor (BR)	• Residential areas where homes are less than 8 metres from the railroad ROW (see Map D-2 to D-4)	• Residential areas where homes are between 8 and 20 metres from the railroad ROW (See Maps D-2, D-3, D-4, D-38 and D-39 in EPR Appendix H) • Scenic areas ○ Allandale Waterfront (see Maps D-70 to D-71 in EPR Appendix H) • Scenic overpasses ○ West Holland River (See Maps D-45 in EPR Appendix H) • GO Stations with visual integrity ○ Allandale (See Maps D-70 in EPR Appendix H) • Bridges with interesting or scenic views ○ King Road (See Map D-27 in EPR Appendix H) and Keele Street (See Map D-27 in EPR Appendix H) • Pedestrian bridges ○ Innes Avenue (See Map D-4 in EPR Appendix H)
Stouffville Corridor (STV)	• Residential areas where homes are less than 8 metres from the railroad ROW (see Maps E-1 and E-7 in EPR Appendix H) • Areas along the STV corridor adjacent to Rouge National Urban Park (see Maps E-21, E-22, E-23 in EPR Appendix H)	• Residential areas where homes are between 8 and 20 metres from the railroad ROW (See Map E-8 in EPR Appendix H) • Scenic areas ○ Main Street Unionville (See Map E-14 in EPR Appendix H) • GO Stations with visual integrity ○ Stouffville (See Map E-24 in EPR Appendix H) • Pedestrian bridges ○ Mooregate Avenue (See Map E-3 in EPR Appendix H)
Lakeshore East Corridor (LSE)	• Residential areas where homes are less than 8 metres from the railroad ROW (see Map F-3 in EPR Appendix H)	• Residential areas where homes are between 8 and 20 metres from the railroad ROW (see Maps F-6, F-7 and F-8 in EPR Appendix H) • Scenic areas

Project Component	High Potential Visual Impact	Moderate Potential Visual Impact
	• Areas along the LSE corridor adjacent to Rouge National Urban Park (see Map F-16 in EPR Appendix H)	○ Lakeshore (See Maps F-13 to F-16 in EPR Appendix H) • Scenic overpasses ○ Rouge Hill (See Maps F-16 in EPR Appendix H) • GO Stations with visual integrity ○ Rouge Hill (See Maps F-14 in EPR Appendix H) • Pedestrian bridges ○ Pape Avenue (See Map F-2 in EPR Appendix H) and Woodrow Avenue (See Map F-6 in EPR Appendix H)

12.2 Taps/Traction Power Facilities

The installation of Taps/Traction Power Facilities have potential to affect views within the surrounding area, particularly where vegetation/tree clearing is required or where there are no existing obstructions. Many Taps and TPFs are expected to have minimal to negligible effects on visual landscapes since they are located in industrial areas. However in cases where a facility is proposed within the vicinity of residential/sensitive areas and/or other visually sensitive areas, landscaping and/or screening will be implemented around the facility. These specific locations include:

- Maple PS (vicinity of Barrie rail corridor)
- Gilford PS (vicinity of Barrie rail corridor)
- Newmarket SWS (vicinity of Barrie rail corridor)
- Scarborough TPS (vicinity of Stouffville rail corridor)
- Scarborough SWS (vicinity of Lakeshore East rail corridor)
- Don Yard PS (vicinity of Lakeshore East rail corridor)

There are several types of screening measures that may be considered to mitigate/reduce the visual impact of the traction power facility, for example: fencing options, and/or structured wall/landscaping options, and/or building enclosure options. Metrolinx will continue to engage relevant municipalities during the detailed design phase to determine the type of screening to be implemented for the above noted traction power facilities.

12.3 OCS Infrastructure

The installation of OCS infrastructure will affect the viewshed along the rail corridors, particularly in areas of vegetation/tree clearing. Therefore, 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 will be identified and specific design measures will be incorporated to mitigate visual impacts of OCS.

12.4 Bridge Barriers

All overhead and pedestrian bridges will require bridge barriers for safety, which may affect views across the bridge. Therefore, during detailed design Metrolinx will determine the preferred bridge barrier designs; as part of this, barrier designs that maintain existing views will be considered and implemented where possible. In addition, a design excellence process will review options for design treatments/options for enhancing the aesthetics of bridge barriers for various categories of bridges in consultation with interested/affected municipalities as appropriate. All bridges will be categorized based on common characteristics to ensure consistency in the approach to determining final design of bridge barriers.

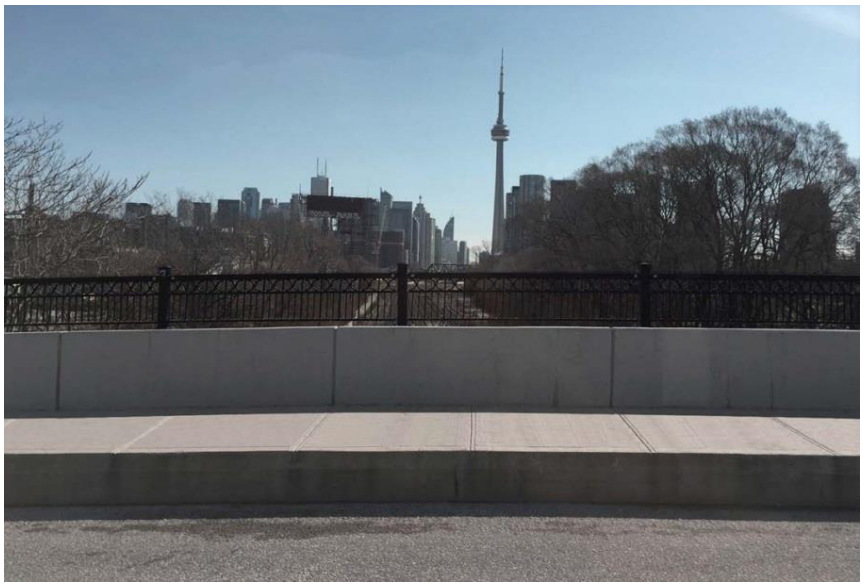
As part of detailed design, Metrolinx's Design Excellence Committee will be engaged to review possible design treatments/option for enhancing the aesthetics of bridge barriers where feasible/required. It is anticipated that the basis of the protection barrier will be a post and panel (solid-faced) design with customizable panels toward suiting visual preferences (in consultation with the applicable bridge owners as appropriate), such as:

- Multilane, restricted access highways and non-visually sensitive locations;
- Visually sensitive locations;
- Structures of heritage value or sensitivity.

Illustrative examples of possible bridge barriers in a visually sensitive location has been provided in **Figures Figure 12-1, Figure 12-2 and Figure 12-3.** It is noted that the final design of each bridge barrier will be determined during detailed design in consultation with relevant municipalities, as appropriate.

Figure 12-1: Illustrative Example of Bridge Barrier in a Visually Sensitive Location

Before



After

Figure 12-2: Illustrative Bridge Barrier Design Examples

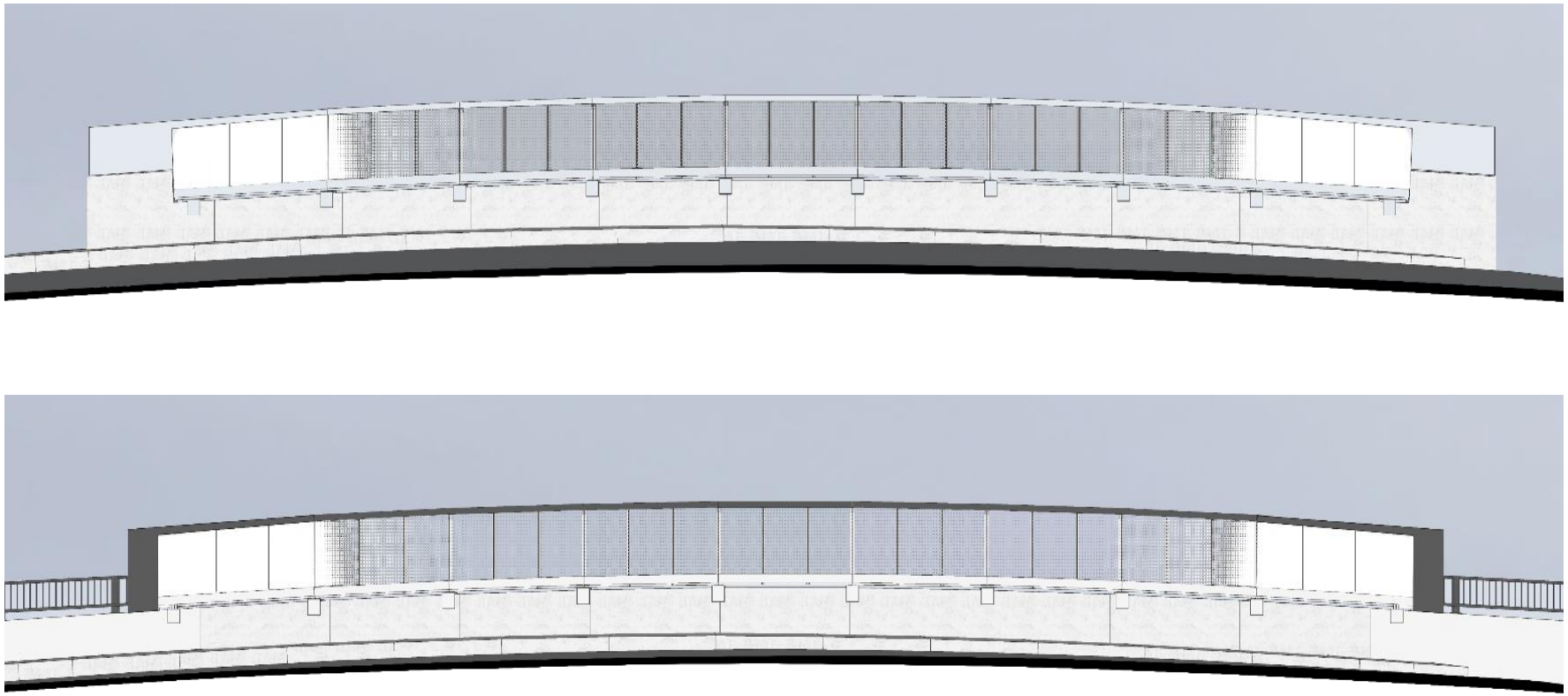


Figure 12-3: Bridge Barrier Design Option Example (Glass Back View)

12.5 GO Stations

At GO Stations, the electrification system should be designed to be as unobtrusive as possible, and where appropriate to fit, in terms of aesthetics and colour, with other Metrolinx infrastructure.

13 Land Use

Refer to Sections **3**.3 and 1.21 outlining commitments related to Municipal permits and specific Municipal commitments.

14 Property

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.

15 Electromagnetic Interference (EMI)/Electromagnetic Fields (EMF)

An Electromagnetic Fields (EMF) and Electromagnetic Interference (EMI) Assessment was carried out as part of the GO Rail Network Electrification TPAP to document existing EMF and EMI conditions within the study area and to determine the potential effects of implementing an electrified GO system 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 GO Rail Network Electrification EMI/EMF Impact Assessment Report (see Appendix J to this EPR) will be implemented.

The following section outlines the commitments Metrolinx and Hydro One will adhere to during future phases of the project following TPAP completion.

Also refer to Sections 1.3.1.10 and 1.3.1.11 for related commitments pertaining to NAVCanada and GTAA.

15.1 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 Impact Assessment Report (see Appendix J to this EPR). 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.

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;
- 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 includes provisions for: immunization of freight track circuits & grade crossings as well as immunization of compatible track circuits, impedance bonds as well as bonding & grounding for TPS currents.

15.1.1 EMC Requirements – Freight and VIA

Electrification of the GO Network will entail certain modifications to the operations/maintenance practices of freight operators (Canadian National Railway, Canadian Pacific Railway) and VIA Rail which may include the following. 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).

15.2 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.

15.3 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.

15.4 Commissioning Phase

During the electrification commissioning phase, overall ELF and RF emissions emanating from the GO electrified railway system as a whole (including emissions from all the electrified tracks, OCS, TPFs, RRMF, and EMU trains) will be field tested and verified to ensure EMFs are within the limits of applicable industry standards.

15.5 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.

15.6 EMF Exposure Reduction

Baseline EMI/EMF measurements will be taken before (initially completed as part of the GO Rail Network Electrification EMI/EMF Baseline Conditions – see Appendix J) and after the electrified transit system construction and operation. 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.

Therefore, during detailed design, verification and/or re-baselining of "before" background EMF levels along the GO rail corridors to be electrified will be undertaken using the data contained in the GO Rail Network Electrification EMI/EMF Baseline Conditions and/or Impact Assessment Report (see Appendix J) as baseline/background information as appropriate.

15.7 Additional Studies – Tap/TPF Sites

- Carry out detailed design and implementation for each Traction Power Facility following the general guidelines of the EMC Control Plan;
- Verification/re-measurement of EMI emissions and ELF at each TPF site as outlined in Volume 3 and EPR Appendix J, and comparison of those measurements with those documented in the GO Rail Network Electrification EMI/EMF Baseline and Impact Assessment Reports (see EPR Appendix J) to verify background measurements as part of detailed design.

15.8 Hydro One – Tap Sites

During the design of the Tap, Hydro One will take EMF into account and minimize EMF where possible.

16 Utilities

16.1 General

Potential effects/conflicts with known utilities due to electrification of the GO network were assessed, and mitigation measures identified as appropriate as part of the TPAP. There are a significant number of utilities and utility owners in the study area. As part of the TPAP, these utilities were contacted regarding the potential effects due to electrification, however the final assessment of utility conflicts due to the proposed GO Rail Network Electrification infrastructure will need to be reviewed during 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 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;
- 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 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 options to implement the appropriate mitigation strategy (see Appendix I - Utilities Report).
- 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.

In addition, the mitigation measures as outlined in Volume 3 of this EPR will be implemented, as required, for potentially affected utilities:

- 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.

16.2 Relocation of Hydro One Transmission Towers

If there are Hydro One towers identified for relocation during detailed design, the appropriate *Environmental Assessment Act* process requirements will be fulfilled as applicable (e.g., TPAP Addendum, Class EA for Minor Transmission Facilities).

17 Climate Change

Modifications to project design/design solutions may be appropriate to reduce vulnerability to changes in climate/weather parameters due to climate change. Potential adaptations to deal with changing climate conditions that will be considered during detailed design include the following:

- *High heat:*
  - Transformers and electrical distribution system: Enhance capacity to deal with higher temperature conditions (in accordance with established Institute of Electrical and Electronics Engineering (IEEE) standards);
  - Implement energy storage devices such as batteries, compressed air and flywheels, that during power outages can bring stranded trains safely to stations; and
  - Sagging wires: Consider utilizing a constant tension system for a broader temperature range (already being included in the Project).
- *Extreme/intense rain and flooding:*
  - Review/modify flood plain/storm frequency design criteria and implement Stormwater Management Plan during construction/operation;
  - Elevate assets to keep from flooding, build flood protection structures;
  - Redirect storm runoff from track bed;
  - Slope stabilization to prevent washouts; and
  - Erosion and sediment control (ESC) measures will be implemented during the construction phase of the project to ensure stormwater runoff is not laden with sediment.
  - Back-up power: Provide back-up power to address power outages considering power storage options during off-peak periods - potentially applicable if more than one traction power substation fails which could trigger shut-down of the whole system.
- *Increased ice accumulation:*
  - Provide structural reinforcement for overhead structures to protect against ice accumulation;
  - Bury sections of wire if possible to protect from ice accumulation;
  - Use remotely operated vehicle to de-ice critical sections of overhead wires;
  - Apply current which heats wire to melt ice from wires; and
  - Apply protective coating which prevents ice from accumulating on the surface.
- *Faster tree growth with potentially higher rates of disease and pest conditions:*
  - Increased tree maintenance along the perimeter of corridors or affecting any project components.

18 Groundwater

The following commitments related to further groundwater assessment will be fulfilled during detailed design as appropriate:

- Develop and implement Spill Response Plan (see Section 1.7.6.10).
- Prepare and Implement a Dewatering Management Plan.
- Any/all requirements for dewatering associated with project activities including but not limited to OCS installation, TPF installation, bridge modifications etc. will be reviewed and confirmed during detailed design.
- With respect to new bridge replacements, a detailed assessment of any potential groundwater/well impacts will be completed as part of a separate EA/TPAP Addendum process as outlined in Volume 1 of this EPR.
- The potential impact on groundwater due to electrification project components is expected to be imperceptible; however, this will be further evaluated at the detailed design stage along with the requirements to obtain a Permit to Take Water (PTTW) or register the water taking on the Environmental Activity and Sector Registry (EASR).
- If additional potential impacts to water supply wells are identified during the detailed design stage, additional assessment will be carried out as appropriate, 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 m 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 stage 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.
- For any private water supply wells that were identified as being located within the property boundaries of the proposed tap/traction power facilities (refer to EPR Appendix V), a well survey will be conducted to verify if the wells are actually present. If present, the wells will be decommissioned in accordance with *Ontario Regulation 903* prior to commencement of any construction activities.

19 Public/Stakeholder Engagement

Metrolinx will continue to engage and communicate with stakeholders beyond TPAP completion as follows:

- Engage with affected property owners within GO Rail Network Electrification 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 is 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.

19.1 Old Riverdale Community

Metrolinx will provide an update to the Old Riverdale Community stakeholders regarding the results of additional EMI baseline measurements taken during detailed design.

20 Ministry of Transportation

As part of the detailed design process, the following commitments will be adhered to by Metrolinx:

- Should Metrolinx require surplus Ministry of Transportation (MTO) land outside the corridor for rail operation purposes, Metrolinx will ensure that a corridor authorization is obtained prior to any work commencing.
- Metrolinx will comply with MTO's requirement, through work that is in-line with MTO's typical construction materials and requirements for the repair of deteriorated concrete/rebar.
- Metrolinx will comply with MTO's policy memo (MTO Structural Manual Section 16.8.1).
- Metrolinx will appropriately prohibit the use of adhesive/mechanical anchors on MTO bridges.
- Metrolinx will comply with MTO's requirement to verify that anchor installations on MTO structures will not damage any pre-stressing cables, void forms, etc.
- Metrolinx will provide appropriate calculations to demonstrate the adequacy of retrofitting the anchor design on existing structures as part of the detailed design phase.
- Metrolinx will enter into a maintenance agreement with MTO with respect to MTO structures.

21 Municipalities

The following commitments will be followed during detailed design and construction:

- Carry out future discussions and negotiations Municipalities in relation to alterations/modifications required on Municipal-owned or Jointly-owned bridges/rail overpasses to accommodate electrification;

- Review options with Municipalities as required to maximize the aesthetics of project infrastructure such as bridge barriers.
- Develop traffic, parking, transit, cycling and pedestrian management strategies to be included in construction contract documents in coordination with Municipalities, as appropriate, to avoid/minimize interference to the extent possible;
- Confirm locations of any additional contractor staging/storage areas required which may require leasing agreements with private property owners and/or the Municipality;
- Metrolinx will engage Municipalities during construction planning/scheduling to ensure that any municipal concerns are addressed in the construction plans prior to commencement of construction activities;
- Metrolinx will continue to coordinate with municipalities during detailed design on land use planning and design (e.g., visual/aesthetics) matters.
- Coordination regarding municipal bridge design, bridge evaluations to determine feasibility of installing protection barriers, extent and type of bridge rehabilitation, and the verification of bridge types, will be undertaken during the detailed design phase.
- Metrolinx will engage Municipalities post TPAP, as appropriate, in relation to finalizing the Tree/Vegetation Compensation Protocol.

21.1 City of Toronto

Metrolinx will continue to consult and coordinate with the City of Toronto during the detailed design /construction phases as follows:

- Carry out future discussions and negotiations with City of Toronto in relation to alterations/modifications required on City/Jointly-owned bridges/rail overpasses to accommodate electrification;
- Review options to maximize the aesthetics of project infrastructure such as bridge barriers (see Section 1.12.4);
- Coordinate with Heritage Preservation Services at the City of Toronto to review detailed designs affecting City heritage resources/properties of interest and incorporate feedback/input into final designs as appropriate;
- Develop traffic, parking, transit, cycling and pedestrian management strategies to be included in construction contract documents in coordination with the City/TTC, as appropriate, to avoid/minimize interference to the extent possible;
- Confirm locations of any additional contractor staging/storage areas required which may require leasing agreements with private property owners and/or the City;
- 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 City bridge design, bridge evaluations to determine feasibility of installing protection barriers, extent and type of bridge rehabilitation, and the verification of bridge types, will be undertaken as required during the detailed design phase;
- Where bridge replacements may be required, work with the City to satisfy *Environmental Assessment Act* requirements for determining preferred bridge design options and assessing environmental impacts/mitigation measures;
- Coordination with the City as required with respect to final design of the Don Yard PS and other TPF locations as appropriate;
- For new infrastructure requiring new municipal water and sewer, ensure coordination with the City;
- If required by City of Toronto, an *Infrastructure Matrix Table* will be provided during detailed design stage once further details regarding utility conflicts, proposed mitigation, etc. are known;
- In the future, detailed collaboration with City staff will be required for the entire USRC (Union station inclusive) between Bathurst St. and the Don River.

21.1.1 Toronto Transit Commission

With regard to required replacement/modifications to the Dufferin St. Bridge, TTC's future plans will be reviewed and considered during detailed design and in consultation with TTC/City of Toronto.

Where OCS conflicts are identified, further consultation will be undertaken with the TTC during detailed design (see Section 1.15) to discuss potential solutions to resolve any conflicts.

21.2 City of Vaughan

The following commitments will be adhered to post TPAP during detailed design with respect to further coordination and consultation with the City of Vaughan:

- Consultation with the City of Vaughan during detailed design to ensure land use/visual considerations associated with the Maple PS facility are coordinated with the City's future development/land use plans in the vicinity of the Block 27 Secondary Plan area.
- The final design of the Maple PS will include visual screening measures around the facility, such as evergreen buffer and/or some other form of physical screening, to minimize visual impacts on the surrounding area to the greatest extent possible (see Section 1.12.2)

21.3 City of Barrie

Consultation with the City of Barrie will be carried out during detailed design with respect to final design and implementation of the 2X25kV Feeder Route along the Barrie Collingwood Rail ROW. In addition, coordination with the City of Barrie regarding future development plans in the vicinity of the proposed Allandale Tap/TPS will also be undertaken as required.

21.4 Town of Innisfil

The following commitments will be adhered to post TPAP during detailed design with respect to further coordination and consultation with the Town of Innisfil as it relates to the Gilford PS facility:

- Continued coordination with the Town of Innisfil will be carried out during the detailed design phase of the Gilford PS with respect to land use planning, visual concerns and any other applicable/related design matters with respect to final design of the Gilford PS facility;
- The final design of the Gilford PS will include visual screening measures around the facility, such as evergreen buffer and/or some other form of physical screening, to minimize visual impacts on the surrounding area to the greatest extent possible (see Section 1.12.2);
- With respect to locating gantry structures required for the Gilford PS as part of detailed design, these structures will be set back as far as possible from the adjacent roadway to minimize visual impacts to the greatest extent possible;
- Metrolinx will continue to communicate and engage with the Town of Innisfil during the detailed design phase with respect to building permit and/or Site Plan approval submissions that may be made in the spirit of co-operation and to provide the municipality with an opportunity to comment (refer to Section 1.3.3); and
- Metrolinx will engage the Town of Innisfil during construction planning to ensure the Town's concerns are addressed in the construction plans prior to commencement of construction activities.

21.5 City of Pickering

It is noted that the proposed Durham SWS location is not anticipated to preclude the implementation of the proposed Plummer Street extension and/or the new arterial road. The future extension of Plummer Street crosses the proposed access road to the SWS site. Further discussions will be undertaking during detailed design with the City of Pickering to better understand the timeline for the City's future study/plans/implementation in order to establish a solution, if required, for any possible conflicts.

21.6 City of Markham

Final details regarding the access route for the Unionville Paralleling Station will be coordinated with the City and Infrastructure Ontario in relation to the planned Miller Avenue extension and potential grade separation over the rail corridor, as required during detailed design.

22 TPAP 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 (and Hydro One where applicable) will comply with O. Reg. 231/08 for reviewing any changes to the project following completion of 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:

a. unforeseen site-specific problems encountered only during detail design and/or construction;
b. improvements in the design to provide greater environmental benefits and/or less adverse effects;
c. elements of the project that were not previously envisioned;
d. circumstances that develop at the time of construction;
e. issues identified in other approvals processes; and/or
f. 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 (see Section **22.1**), or (2) Significant Changes (see Section **22.2**). The following questions may be applied to the proposed change as part of the review to determine how it should be dealt with:

a. Is there a change to what was proposed to be built?
b. 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.

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
- 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.

Some examples of insignificant changes may include:

a. The alteration or change in the site layout or configuration of equipment within the previously identified Tap/Traction Power Facility sites.
b. Deletion of a proposed Tap location and/or Traction Power Facility that is determined to be unnecessary during detailed design or construction.
c. Deletion of a gantry, access road or underground duct bank previously identified or included in the GO Rail Network Electrification EPR that is determined to be unnecessary during detailed design or construction.
d. Reduction of the 5m OCS Impact Zone and/or reduction in the 7m vegetation clearing zone.
e. Changes to a type of bridge or rail overpass modification required in order to implement electrification (e.g., attachment of OCS wires or flash plate deemed required), where the alteration or change results in similar or reduced potential environmental effects as compared to the effects documented in the GO Rail Network Electrification EPR.
f. As a result of a change during construction (except for emergencies), changes to a method of construction, such as OCS pole installation method, where the alteration or change results in similar or reduced potential environmental effects as compared to the effects documented in the GO Rail Network Electrification EPR.

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
- A statement of whether the changes were deemed significant or not and the reasons for this opinion

In addition, in accordance with *O. Reg. 231/08*, A Notice of Environmental Project Report Addendum will be published, and provided to the Director (MOECC), Regional Director (MOECC), landowners within 30m

of the site/location of the change, Indigenous communities on the Project Mailing List and any other person who may be interested in the change.

Some examples of significant changes may include:

a. As a result of detailed design, the addition or complete relocation of a Tap location or Traction Power Facility site to a new location that was not previously identified or included in the GO Rail Network Electrification EPR, where the change results in different and/or increased potential environmental effects as compared to the effects documented in the GO Rail Network Electrification EPR.

b. As a result of a detailed design, changes to a type of bridge or rail overpass modification required in order to implement electrification (e.g., bridge replacement), where the alteration or change results in increased potential environmental effects as compared to the effects documented in the GO Rail Network Electrification EPR.

    - Where the structure is jointly owned between Metrolinx and a third party (e.g., Municipality), the two parties will need to agree on the appropriate EA/TPAP Addendum process to be followed to address the amendment.

c. As a result of a detailed design, change(s) necessitating an increase to the 5m OCS Impact Zone and/or the 7m Vegetation Clearing Zone as defined in the GO Rail Network Electrification EPR that may cause adverse environmental effects not previously identified.

d. As a result of a change during construction (except for emergencies), changes to a method of construction (e.g., substantive dewatering required), where the alteration or change results in increased potential environmental effects as compared to the effects documented in the GO Rail Network Electrification EPR.