Kitchener Corridor Expansion - Guelph Subdivision Electrification TPAP

Public Meeting Round 2 - Guelph Wellington

July 22 - August 12, 2020
ELECTRIFICATION INFRASTRUCTURE

• This project is assessing the environmental impact of infrastructure required to electrify approximately 54 kms of the Kitchener rail corridor.

• In Guelph Wellington, this includes:
  • One Hydro One Tap
  • One Traction Power Facility (TPF)
    • Traction Power Substation (TPS)
  • Overhead Contact System (OCS) infrastructure
    • Gantries, aerial/underground feeders
    • Grounding and bonding
  • Bridge modifications required to accommodate electrification

This project examines the potential environmental effects of electrification, including construction and operation of the proposed infrastructure.
HOW THE ELECTRIFIED SYSTEM WILL WORK

Hydro One Components

- Existing Hydro One 230kV Transmission Lines
- New Hydro One owned Aerial 230kV Connection
- New Hydro One owned Tap Structures
- Disconnect Switch

Metrolinx Components

- Metrolinx Traction Power Facility
- Metrolinx owned Tap Structures
- Underground Duct Bank
- Portal/Cantilevers
- Overhead Contact System
- Gantries
- Pantograph

GUELPH SUBDIVISION ELECTRIFICATION TPAP
Example Tap Structures
Electrification of the GO network will require electrical power to be supplied from Ontario’s electrical system through Hydro One’s existing high voltage grid via a new 230 kilovolt (kV) tap connection.

As illustrated in the figure, the Hydro One Tap study area extends from Westwood Road to the north, and southerly beyond the Metrolinx Kitchener rail corridor, east of Highway 6.
• The proposed electrified corridor will be a 2 x 25 kV alternating current (AC) autotransformer fed electrification system which will be connected directly to a high voltage system.

• A Traction Power Substation (TPS) is a type of Traction Power Facility (TPF).

• The proposed TPS will transform the utility supply voltage of 230 kV to 2 x 25 kV along the OCS for distribution to the electric trains along the rail corridor.
Hydro One has advised that adequate power is not available at this location and it may not be able to provide a power supply. Additional work will be required post TPAP to find a suitable electrical connection point.
ADVANTAGES OF THE RECOMMENDED TPS LOCATION

✓ Adjacent to rail right-of-way, and close proximity to Hydro One 230 kV transmission line. However, Hydro One has advised that adequate power is not available to supply power at this location and future power supply is not guaranteed.

✓ There are currently no development applications for the area

✓ No Designated Natural Areas or wetlands

✓ No known cultural heritage resources within 50 metres

✓ No registered archaeological sites within 50 metres
OVERHEAD CONTACT SYSTEM (OCS)

- The OCS consists of a wiring system (i.e., messenger wire and contact wire) that provides efficient transfer of traction power to the pantograph, mounted on the train, and then to the electric drive motors.

- The OCS is a fundamental component of the traction power distribution system and generally includes the following infrastructure components:
  - OCS pole foundations
  - Portal/cantilever poles
  - Contact, autotransformer and feeder wires

- An OCS Impact Zone was established to assess the potential effects.
KITCHENER RAIL CORRIDOR OVERHEAD BRIDGES AND RAIL OVERPASSES
Guelph Wellington

Legend
- MetroLinx Route
- Proposed Campbell Traction Power Substation
- Proposed Hydro One Tap Study Area
- TRAP Study Area
- Mile Marker
- GO Station
- Overhead Bridge
- Rail Overpass
- Upper Tier Municipal Boundary
- Lower Tier Municipal Boundary

Metrolinx, Gannett Fleming, AECOM Joint Venture
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POTENTIAL BRIDGE MODIFICATIONS

OCS Attachments
• Used for support of OCS wires in situations with restricted clearance such as tunnels and overhead bridges.

Vertical Clearance
• There are minimum vertical clearance requirements for overhead bridges. Modifications are required for bridges that do not meet this minimum clearance.

Bridge Barriers
• Solid barriers are required on overhead bridges for the safety of users as well as the protection of the energized equipment.

Flash Plates
• A conductive plate is installed between an energized wire and reinforced concrete. It is used to prevent ‘flash over’, which is where current finds its way into the reinforcing steel.
OVERVIEW - TREE REMOVAL AND MANAGEMENT STRATEGY

Why Trees Need to be Removed
Vegetation removal ensures safe delivery and operation of the new infrastructure required to support electrification and service increases. A 7 metre Vegetation Clearance Zone, identified as part of the GO Rail Network Electrification 2017 Transit Project Assessment Process (TPAP), will be established to:

- Protect infrastructure, including that for electrification;
- Increase operational reliability and minimize safety concerns associated with the risk of tree limbs falling onto overhead wires; and
- Accommodate for worker and operational safety through the preservation of sightlines.

Vegetation Management Strategy
A strategy has been developed in an effort to proactively guide management of vegetation along the electrified corridor and for other infrastructure that falls within close proximity to the rail right-of-way (communication and signal installations, yard and station grounds etc.).

The strategy will contribute to the ecological natural heritage of the area through sustainable vegetation management practices, as well as to control the growth/overgrowth of invading vegetation, noxious weeds, and invasive species.

Based on the objectives of the Vegetation Management Strategy, five (5) zones have been developed to address Metrolinx infrastructure and service reliability.
OVERVIEW - VEGETATION REMOVAL

VEGETATION REMOVAL ZONE

VEGETATION PLANTING
RECOMMENDATIONS

ZONE 5
TALL GROWTH
(MAX HEIGHT)

ZONE 4
MEDIUM GROWTH
(MAX HEIGHT)

ZONE 3

ZONE 2
NO GROWTH

ZONE 1
NO GROWTH

ZONE 3

ZONE 2
NO GROWTH

ZONE 1
NO GROWTH

VEGETATION EXCLUSION ZONE

BREATHING NO VEGETATION
OVERWING BEYOND GROWTH ZONE OR WITHIN
2.5M OF ELECTRICAL COMPONENTS, ACTIVE WIRE OR STRUCTURE

PROPERTY NOT OWNED BY METROLinx
NO VEGETATION REMOVAL ANTICIPATED UNLESS DEEMED
HAZARDOUS ANY REPLANTING SHOULD BE UNDERSTAINED IN
ACCORDANCE WITH VEGETATION PLANTING RECOMMENDATIONS