

GO Rail Network Electrification Transit Project Assessment Process

Study Summary: Natural Environmental Assessment (Appendix A)

Scope of the Study

The scope of the GO Rail Network Electrification Transit Project Assessment Process (TPAP) involves electrification of the following GO Transit rail corridors:

1. Union Station Rail Corridor – From UP Express Union Station to Don Yard Layover
2. Lakeshore West Corridor – From just west of Bathurst St (Mile 1.20) to Burlington
3. Kitchener Corridor – From UP Express Spur (at Highway 427) to Bramalea
4. Barrie Corridor – From Parkdale Junction (off Kitchener Corridor) to Allandale GO Station
5. Stouffville Corridor – From Scarborough Junction (off Lakeshore East Corridor) to Lincolnville GO Station
6. Lakeshore East Corridor – From Don Yard Layover to Oshawa GO Station

The Study Area encompasses the GO Transit rail corridors outlined above including the defined vegetation removal zone (i.e., an area extending 7m from the outermost electrified tracks on each side of the corridor), proposed locations for Tap and Traction Power Facilities, and electrical feeder routes.

The Natural Environmental Assessment Report for the GO Rail Network Electrification is composed of two parts: i) Natural Environmental Baseline Conditions Report and ii) Natural Environmental Impact Assessment Report.

Approach/Methodology

Baseline conditions information for the study area was collected and summarized/mapped, including the following:

- Ecological Land Classification – The terrestrial vegetation communities within the project study areas area were classified to the community level, according to the Ecological Land Classification (ELC) for Southern Ontario (Lee et al., 1998), which is a tool for the identification, description, naming, mapping and monitoring of ecosystems across Southern Ontario.
- Terrestrial Features
 - Wetlands
 - Vegetated Areas
 - Wildlife
 - List
- Aquatic Features
 - Watercourses
 - Fish species
- Designated Areas
- Species at Risk

The impact assessment phase entailed a comprehensive evaluation of potential effects on the natural environment due to: the physical project footprint (installation of electrification infrastructure), operational effects of the electrified system and its components, as well as short term construction activities. Following identification of potential effects, mitigation measures were established to either eliminate or minimize adverse effects.

Vegetation/tree removals are a significant component of the electrification project – therefore the subsection below provides further detail on the process followed to characterize vegetation/tree removal impacts at the TPAP stage.

Tree/Vegetation Removal

A Vegetation Clearing Zone is required in order to provide safe electrical clearances to any existing vegetation along the rail corridors. The Vegetation Clearing Zone entails vegetation removals within the 5m Overhead Contact System (OCS) Impact Zone plus an additional 2 m offset area on either side of the OCS components. As a result, the total clearing area is defined as 7m measured from the centerline of the outermost tracks to be electrified on either side of each rail corridor. The 7m zone is considered a maximum removal zone.

Vegetation clearing is required to:

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

The following approach was taken to assess potential ecological impacts associated with the required tree/vegetation removal for the electrification project. There were two components to the analysis:

- 1) Identification of ecological impacts related to tree/vegetation removals, and
- 2) Characterization of the extent of tree/vegetation removals.

To classify potential ecological impacts due to tree/vegetation removal, they were categorized as either: **negligible, low, moderate, or high**. Using Geographic Information Systems (GIS) technology, Ecological Land Classification (ELC) communities along the corridors/feeder routes were mapped, and the areas (in hectares [ha]) of potential vegetation/tree removal were calculated for each type of ELC community for each corridor segment.

In order to further characterize tree removals specifically, the extent of tree removals within each ELC community was categorized as **minor, fair, or extensive** based on the canopy cover within each respective ELC community.

- Where canopy cover is minimal (<10%) or limited (10-20%), the extent of removals is considered **minor**.
- For areas with intermediate (20-70%) canopy cover, the extent of tree removals is considered **fair**.
- For communities with high (>70%) canopy cover, tree removals are anticipated to be **extensive**.

It is noted that the assessment of tree/vegetation removal impacts at the TPAP stage is a preliminary assessment. Further more detailed inventories/studies will be completed during detail design phase in order to further quantify the extent of tree/vegetation removals.

Summary of Impact Assessment Results

Tree/Vegetation Removal

The assessment of potential tree/vegetation removal impacts has been summarized for each rail corridor and 25kV feeder route within the Natural Environment Impact Assessment Report and preliminary calculations for the extent of tree/vegetation removals has been provided. The following table provides an example of how the calculations are presented (please refer to Appendix A for details):

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
Commercial and Institutional	0.521	0.039	0.560	Minor

ELC Community	Area within ROW (ha)	Area outside ROW (ha)	Total Area (ha)	Extent of Tree Removals (based on canopy cover within ELC community)
(CVC)				
Transportation and Utilities (CVI)	14.458	5.060	19.608	Minor
Residential (CVR)	0.572	0	0.572	Fair
Deciduous Thicket (THD)	0	0	0	N/A
Green Land (CGL)	0.003	0.003	0.006	Minor

Tree/vegetation removals required for Tap/TPF sites have also been assessed in each respective subsection. The presence/absence of Species at Risk (e.g., Butternuts) within the vegetation clearing zone will be confirmed during detailed tree inventories of impacted areas during detail design.

Vegetation/Tree Removals – Mitigation Measures

Metrolinx is establishing a Vegetation Compensation Protocol (the Protocol) for Metrolinx Rapid Express Rail (RER) projects and vegetation that is removed will be compensated for in accordance with the provisions of this protocol.

For Municipal/Private Trees: Metrolinx will work with each municipality to develop a municipality-wide streamlined tree permitting /compensation approach for municipal and private trees. The goal is to reduce administrative permitting burden for trees along long stretches of rail corridor.

For Trees within Metrolinx Property: Metrolinx is developing a methodology to compensate for trees located within Metrolinx’s property. This will involve categorizing trees community types/ ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final compensation plan.

Conservation Authorities: For vegetation removals within conservation authority lands where required, applicable removal and restoration requirements will be followed.

Federal Lands: For vegetation removals within Federally-owned lands where required, applicable removal and restoration requirements will be followed.

Tree End Use: We will develop options for the end use of trees removed from Metrolinx property e.g., reuse/recycling options.

Metrolinx is continuing to work towards the Protocol and will follow up with stakeholders that have been engaged and participated to date and provide a draft for review. The final Environmental Project Report will contain commitments to the Protocol which will be made publicly available once finalized.

Bridge Modifications

Bridges requiring modifications will require mitigation measures related to the protection of migratory birds. Mitigation measures have been developed to ensure compliance with the Migratory Bird Convention Act (MBCA) in order to reduce/mitigate the potential for adverse effects on birds and their nests. See Appendix A for detail.

Union Station Rail Corridor

There will be a loss of trees/vegetation within the vegetation removal zone along the Union Station Rail Corridor. Refer to *Vegetation/Tree Removals – Mitigation Measures* outlined above.

There are no Traction Power Facility (TPF) sites or Tap locations proposed along this corridor. There are no *Designated Areas*¹ within the corridor. The presence/absence of Species at Risk trees will be confirmed during detailed tree inventories of impacted areas during detail design.

There are no anticipated impacts to watercourses/aquatic features.

Lakeshore West Rail Corridor

There will be a loss of trees/vegetation within the vegetation removal zone along the Lakeshore West Corridor and Canpa 25kV feeder route. Refer to *Vegetation/Tree Removals – Mitigation Measures* outlined above.

Lorne Park Prairie, an Area of Natural and Scientific Interest, is within the vegetation removal zone along the corridor. Vegetation removals within this area should be minimized to the extent possible.

There are four TPF's and two Tap locations within the Lakeshore West Corridor. There are no watercourse features present within the TPF or Tap locations. Loss of vegetation within the TPF and Tap locations will result from the footprint of the TPF and Tap components within Burlington TPS, Mimico Tap/TPS, and Mimico Switching Station (SWS). There are no natural features associated with Oakville SWS. The loss of vegetation at these facilities is considered negligible.

There are no anticipated impacts to watercourses/aquatic features.

Kitchener Corridor

There will be a loss of trees/vegetation within the vegetation removal zone along the Kitchener Corridor and Bramalea 25kV feeder route. Refer to *Vegetation/Tree Removals – Mitigation Measures* outlined above.

There will be a loss of vegetation within the Bramalea Paralleling Station (PS) location. Vegetation removals within Bramalea PS are considered negligible.

There are no anticipated impacts to watercourses/aquatic features.

Barrie Corridor

There will be a loss of trees/vegetation within the vegetation removal zone along the Barrie corridor and Allandale 25kV feeder route. Refer to *Vegetation/Tree Removals – Mitigation Measures* outlined above.

Designated Areas located within the vegetation impact zone include: King-Vaughan Wetland Complex Provincially Significant Wetland (PSW), Maple Uplands and Kettles Candidate Life Science ANSI, Wesley Brooks Conservation Area, Aurora McKenzie Marsh Wetland PSW, Rodgers Reservoir Conservation Area, Holland River Marsh PSW, Scanlon Creek Conservation Area, Holland River ANSI, Little Cedar Point PSW, Wilson Creek PSW, Oak Ridges Moraine Conservation Plan Areas (Settlement, Countryside, Natural Linkage, Natural Core), and Greenbelt Protected Countryside. Vegetation removals within these areas should be minimized to the extent possible.

There are four TPF's and one Tap location within the Barrie Corridor. Vegetation removals within Allandale Tap, Allandale TPS, Newmarket SWS, Gilford PS, Maple PS, will be required; the loss of vegetation at these facilities is considered negligible.

¹ *Designated Areas include Evaluated Wetlands, Areas of Natural and Scientific Interest (ANSIs), Environmentally Significant/Sensitive Areas (ESAs), Provincial Parks, Conservation Areas, and areas within the Greenbelt and Oak Ridges Moraine.*

The Maple PS does not currently contain suitable breeding habitat for Eastern Meadowlark or Bobolink. However, crop cover should be reviewed again prior to the commencement of construction. In the event suitable crop cover is planted supporting breeding habitat conditions for Eastern Meadowlark or Bobolink, a specialized SAR breeding bird survey will need to be undertaken during detailed design to determine the presence/absence of Eastern Meadowlark and Bobolink within the AG (Agricultural) communities.

There are no anticipated impacts to watercourses/aquatic features.

Stouffville Corridor

There will be a loss of trees/vegetation within the vegetation removal zone along the Stouffville Corridor/25kV feeder route. Refer to *Vegetation/Tree Removals – Mitigation Measures* outlined above.

There are three TPF's and one Tap location within the Stouffville Corridor. Vegetation removals within Scarborough Tap, Scarborough TPS, Unionville PS, and Lincolnville PS will be required; the loss of vegetation at these facilities is considered negligible.

Designated Areas located within the vegetation impact zone include: Stouffville Conservation Area, Stouffville Marsh Evaluated Wetland, Oak Ridges Moraine Conservation Plan Areas (Settlement and Countryside), and Greenbelt Protected Countryside. Vegetation removals within these areas should be minimized to the extent possible.

There are no anticipated impacts to watercourses/aquatic features.

Lakeshore East Corridor

There will be a loss of trees/vegetation within the vegetation removal zone along the Lakeshore East Corridor/25kV feeder route. Refer to *Vegetation/Tree Removals – Mitigation Measures* outlined above.

Designated Areas located within the vegetation impact zone include: East Point Environmentally Significant Area (ESA), Petticoat Creek Conservation Area, Rouge Valley ANSI, Lynde Shores Conservation Area, Rouge National Urban Park, and Greenbelt Protected Countryside. Although vegetation within the removal zone is mainly culturally influenced, vegetation removals within these areas should be minimized to the extent possible.

A Bank Swallow colony has been confirmed within bluffs at approximately (Kingston Sub Mile 316.9), approximately 30m south of the edge of vegetation removal zone. No direct impacts are anticipated.

There are four TPF's and one Tap location within the Lakeshore East Corridor. Vegetation removals within the ERMF Tap, ERMF TPS, Scarborough SWS, Durham SWS, and Don Yards PS will be required; the loss of vegetation at these facilities is considered negligible. There is potential for Butternut to occur within Don Yard PS. Ten (10) suspected Butternut hybrids observed during the 2016 field investigations will require further assessment during detail design to determine if registration under the *Endangered Species Act* is required.

There are no anticipated impacts to watercourses/aquatic features.

For additional more detailed information, please refer to the Natural Environment Impact Assessment Report (which is organized by rail corridor for easy reference) contained in Appendix A.

Mitigation Recommendations

In addition to the *Vegetation/Tree Removals – Mitigation Measures* described above, the following mitigation measures will be implemented as appropriate.

Trees/Vegetation

- Vegetation Management Plans will be developed and implemented during detail design in order to minimize/mitigate the potential impacts related to vegetation/tree removals;

- Crop cover at Maple PS should be reviewed again prior to the commencement of construction. In the event suitable crop cover is planted supporting breeding habitat conditions for Eastern Meadowlark or Bobolink, a specialized SAR breeding bird survey will need to be undertaken to determine the presence/absence of Eastern Meadowlark and Bobolink within the AG (Agricultural) communities;
- Tree/vegetation removals within *Designated Areas*² should be minimized to the extent possible;
- Indirect impact avoidance measures for the Bank Swallow colony confirmed within the bluffs at approximately Kingston Sub Mile 316.9 are identified in the AECOM (2016) study;
- 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;
- Compliance with the Forestry Act in relation to trees planted on the boundary between two lands (i.e., lands that are Metrolinx owned and lands that are not Metrolinx owned) is required.

Bridge Modifications

To ensure compliance with the Migratory Bird Convention Act (MBCA), the following mitigation measures are proposed in order to reduce or mitigate the potential for adverse effects on birds and their nests:

- Bridges shall be inspected for nests and eggs prior to any construction activities.
- Nests and eggs of protected migratory birds shall not be destroyed during migratory bird nesting season (April 1st to August 31st).
- Nests and eggs of protected Species at Risk birds shall not be destroyed at any time. If the nest of a protected Species at Risk must be damaged or destroyed, a permit under the Endangered Species Act is required.
- If a nest is removed from bridge, the bridge should be netted outside of the breeding bird season to prevent the recurrence of nesting activity.

Species at Risk and Protected Features

- Should any Butternuts be found during detailed tree inventories will require a Butternut Health Assessment to be completed by a qualified Butternut Assessor. Depending on the number and health of Butternuts impacted, registration or permit may be required in consultation with the Ministry of Natural Resources and Forestry (MNRF);
- 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, consultation with the MNRF will be required to determine the appropriate approval or permitting requirements;
- 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;
- 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 under the ESA;
- Where removal 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; and
- Due to potential habitat within Agricultural land (AG) at Maple 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.

Where Species at Risk habitat is identified/confirmed during detail design, recommended mitigation measures for species such as Redside Dace, Species at Risk bats, and Species at Risk birds include conducting activities (i.e. tree/vegetation clearing) outside of designated timing windows for these species where possible/feasible. The timing windows are as follows:

² *Designated Areas include Evaluated Wetlands, Areas of Natural and Scientific Interest (ANSIs), Environmentally Significant/Sensitive Areas (ESAs), Provincial Parks, Conservation Areas, and areas within the Greenbelt and Oak Ridges Moraine.*

- Species at Risk birds are protected by the general migratory bird window of April 1st to August 31st;
- Species at Risk bats are protected by the timing window of April 30th to July September 1st;
- Redside Dace are protected by the timing window of September 16th to June 30th.

Aquatic Resources

There are no direct impacts to watercourses anticipated as a result of the electrification project. Potential indirect effects of the construction works include siltation, introduction of contaminants into the watercourse through the use of industrial equipment, and construction debris. These potential impacts can be mitigated by implementing the following measures related to sediment and erosion control:

- Adhere to relevant guidelines and Ontario Provincial Standard Specifications relating to proper sediment and erosion controls including consideration of TRCA5 Erosion and Sediment Control Guidelines to Urban Construction) and Ontario Provincial Standards Specifications (OPSS) – OPSS 805 (Erosion and Sediment Control Measures).
- Design and implement erosion and sediment controls to contain/isolate the construction zones, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment to any watercourses, and ensure sites are stabilized prior to removal following construction.
- Stockpiles to be located at a minimum of 30m from watercourses and isolated to ensure material will not enter any watercourse or ditchline. All stockpiles to be removed upon completion of the works and the site restored, as appropriate.
- Exposed soils to be stabilized with hydroseed within 45 days.
- Limit access to waterbody and banks to protect riparian vegetation and minimize bank erosion.

In the event the need for in-water works is identified post TPAP, the following mitigation measures shall include but not exclusive to:

- 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 (DFO) review;
- All in-water works shall comply with the timing windows identified by MNRF; and
- Compliance with OPSS 180 (Management of Excess Materials) and OPSS 182 (Environmental Protection for Construction in Waterbodies and on Waterbody Banks) during construction.

For a complete list of mitigation measures, please refer to the Natural Environment Impact Assessment Report (which is organized by rail corridor for easy reference) contained in Appendix A.

Next Steps/Future Work

During detailed design, the 7m vegetation clearing zone may be reduced in certain areas where/if possible based on the final OCS design. Vegetation Management Plans will be developed for each electrified corridor/feeder route. These Vegetation Management Plans will consist of:

- **Detailed Tree Inventories** – surveys will identify GPS location of trees to be removed, as well as additional details for: species, diameter at breast height (DBH), and overall condition;
- **Tree Protection** – Detailed measures will be implemented to protect retained adjacent trees during construction. This will include tree protection zone limits, diagram of tree protection barrier type, tree protection measures, and construction storage and staging areas where information is available; and
- **Implement Vegetation Compensation** Protocol as outlined above–.
- Consultation with property owners for tree removals on private property.
- If vegetation removals are required within the timing window, a nest survey will be conducted prior to removal
- Further bat inventories and tree cavity assessments may be required in conjunction with detailed tree inventories during detail design along the corridors.

- Additional consultation with MNRF to be undertaken as required during detail design, for identified SAR species, including but not limited to: Redside Dace, Bats, Butternut, Barn Swallow, Eastern Meadowlark and Bobolink.
- An Environmental Management System (EMS), will be developed prior to construction and implementation of the project 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.
- Adherence to all applicable legislative requirements including but not limited to: *Forestry Act*, *Migratory Bird Convention Act*, *Species at Risk Act*, *Fisheries Act*, *Invasive Species Act*, *Transportation of Dangerous Goods Act*, and *Endangered Species Act*.
- All applicable permits and approvals will be obtained as required based on detail design, including Municipal Tree Removal Permits.