Oshawa to Bowmanville Rail Service Extension: Environmental Project Report Addendum

October 2023

Prepared for:

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Executive Summary

Project Overview

In February 2011, the Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility Environmental Project Report (EPR) was prepared by AECOM on behalf of GO Transit (GO) in accordance with the Transit Project Assessment Process (TPAP) under Ontario Regulation (O. Reg.) 231/08 - Transit Projects and Metrolinx Undertakings. Notice to Proceed was provided by the Minister of the Environment on March 28, 2011, and the Statement of Completion was issued on April 13, 2011. The EPR was completed to support required infrastructure improvements to address capacity requirements, manage traffic and support sustainable urban development along the GO rail system from 500 metres (m) west of Brock Street in the Town of Whitby to 500 m east of Regional Road 42/Darlington-Clarke Townline Road in the Municipality of Clarington.

The Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility Project consisted of installing additional track along the existing Canadian Pacific Railway (CP Rail) corridor to accommodate extended train service, a new connection from the GO Lakeshore East Rail Corridor to the CP Rail corridor through Corbett Creek and the construction of new GO stations, a new maintenance facility and a new layover facility. These project components were defined in the EPR to consider the potential environmental impacts of the project and recommend appropriate mitigation measures to be applied as design of the project advanced.

Since the completion of the EPR in 2011, Metrolinx has advanced the design of the project through additional feasibility work, use of the General Motors (GM) Spur in the updated alignment to remove the Corbett Creek crossing, changing GO station needs, removal of the Rundle Road train layover and in discussions with CP Rail regarding the use of its rail corridor for the new GO rail service. Metrolinx has undertaken this EPR Addendum to address project refinements and revisions to the design approach since the completion of the EPR in 2011.

This EPR Addendum documents the proposed changes to the project since the completion of the EPR in 2011, now referred to as the Oshawa to Bowmanville Rail Service Extension (the Project). It includes a review of the need, potential effects, proposed mitigation and significance associated with these Project changes, in accordance with Section 15 (1) of O. Reg. 231/08. The changes contemplated in this report include track alignment, track and supporting infrastructure, GO station locations, new and expanded bridges, and widening of at-grade crossings.

Study Process

The 2011 Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility EPR was completed under the TPAP as outlined in O. Reg. 231/08. Notice to Proceed was provided by the Minister of the Environment on March 28, 2011, and the Statement of Completion was issued on April 13, 2011.

As outlined in Section 15 (1) of O. Reg. 231/08, if a proponent wishes to make a change to a transit project that is inconsistent with a completed EPR, an addendum to the EPR must be prepared. These proposed changes to the Project were determined to be inconsistent with the Project Description outlined in the Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility EPR (AECOM 2011a). In addition, as per Section 16 of O. Reg. 231/08, should a project not commence construction within 10 years of the Statement of Completion, a review of the project documentation is required. The Statement of Completion for the 2011 EPR is dated April 13, 2011 and more than 10 years has lapsed since the filing of this document. This EPR Addendum fulfills the requirements of Section 15 (1) and Section 16 of O. Reg. 231/08.

As O. Reg. 231/08 does not define significance, Metrolinx has developed its own approach to evaluate whether a proposed change to a project is significant, and whether an addendum is required and if consultation is required as part of the addendum process. Based on the analysis undertaken, Project changes have been identified as Significant, requiring a Notice of EPR Addendum and Notice to Proceed from the Minister of the Environment, Conservation and Parks.

Subsequent to completion of this EPR Addendum, and filing a Notice of EPR Addendum, the EPR Addendum document is made available to the public, regulatory agencies, elected officials, Indigenous communities and other interested persons for review. The public review period will be for 30 days, in accordance with O. Reg. 231/08. Interested persons may submit objections to the transit project within the 30-day period to be considered by the Minister of the Environment, Conservation and Parks (the Minister).

After the 30-day public review period, the Minister has 35 days to consider whether the project may have a negative impact on a matter of provincial importance or a constitutionally protected aboriginal or Treaty rights and consider any objections received. Whether there is an objection or not, the Minister may issue one (1) of three (3) notices to the proponent:

- a notice to proceed with the transit project as outlined in the Addendum Report
- a notice that requires further steps such as additional study or consultation
- a notice allowing the project to proceed, subject to conditions imposed by the Minister

If the Minister does not act within the 35-day period, the transit project may proceed as planned in the EPR Addendum.

Project Components

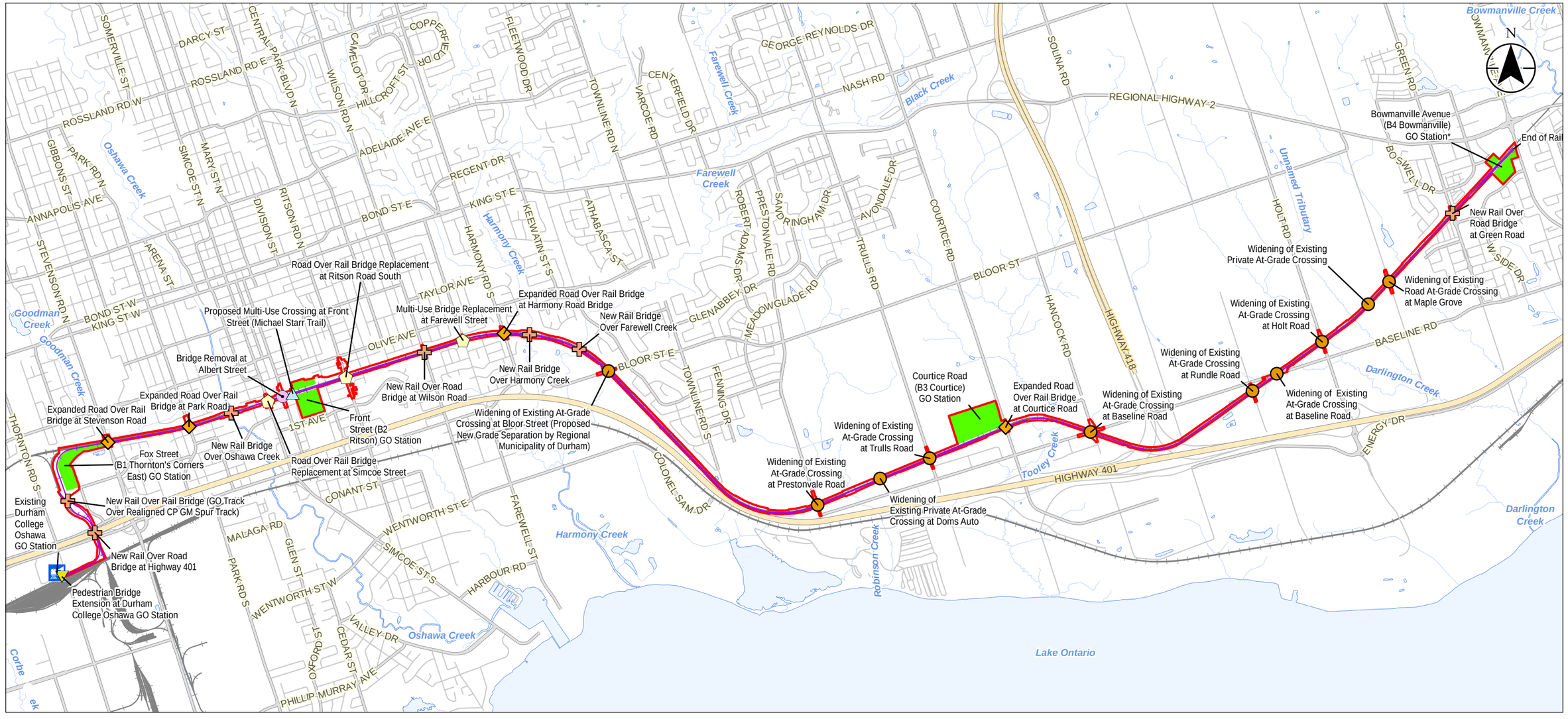
The Project includes the extension of GO rail service from the Durham College Oshawa GO (DC Oshawa GO) Station[1] through to Bowmanville, with four new proposed GO stations (Figure ES.1). In summary, the following Project components are proposed to be located on or adjacent to the rail corridor:

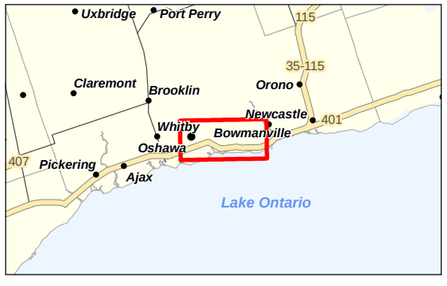
- Tracking, supporting track infrastructure, grading:
  - Proposed new track within the existing GO Lakeshore East Rail Corridor at the western limit of the Project, crossing Highway 401 via the existing GM Spur bridge. A new bridge will be constructed adjacent to the existing GM Spur bridge for the proposed realigned CP Rail track. The new GO track will extend north to the existing CP Rail corridor, ending at Bowmanville Avenue.
  - Retaining walls and grading[2] to support track infrastructure
- Proposed GO station locations in proximity to:
  - Fox Street (B1 Thornton's Corners East)
  - Front Street (B2 Ritson)
  - Courtice Road (B3 Courtice)
  - Bowmanville Avenue (B4 Bowmanville)
- New bridges at the following locations:
  - Highway 401
  - GM Spur
  - Oshawa Creek
  - Wilson Road
  - Farewell Creek
  - Harmony Creek
  - Green Road
- New multi-use crossing (bridge or tunnel, to be determined):
  - Front Street (Michael Starr Trail)

[1] In October 2022, Metrolinx announced that the Oshawa GO Station has been renamed Durham College Oshawa GO. Therefore, throughout the EPR Addendum and this Project, the Oshawa GO Station is referred to as Durham College Oshawa GO, or DC Oshawa GO.
[2] Grading includes sloping and contouring the earth to achieve the desired base to support rail infrastructure. Retaining walls may be proposed to limit grading impacts on adjacent properties.

- Bridge replacements at the following locations:
  - Simcoe Street
  - Ritson Road
  - Farewell Street[3]
- Bridge removal at Albert Street
- Bridge expansions at the following locations:
  - DC Oshawa GO (pedestrian bridge)
  - Stevenson Road
  - Park Road
  - Harmony Road
  - Courtice Road
- Widening of at-grade crossings to accommodate GO track(s) at the following locations:
  - Bloor Street
  - Prestonvale Road
  - Private crossing for Dom's Auto
  - Trulls Road
  - Baseline Road (two crossings)
  - Rundle Road
  - Holt Road
  - Private crossing west of Maple Grove Road
  - Maple Grove Road

[3] Multi-use bridge only. Multi-use bridges can be used by pedestrians and cyclists crossing the rail corridor.





Legend

- Project Footprint
- Existing Durham College Oshawa GO Station
- Proposed Pedestrian Bridge Extension
- Proposed New Bridge
- Proposed Bridge Replacement
- Proposed Bridge Removal
- Proposed New Multi-Use Grade-Separated Crossing
- Proposed Upgrades to At-Grade Crossing
- Proposed Bridge Expansion
- Proposed GO Station Location
- Existing Railway
- Proposed Tracks
- Highway
- Major Road
- Minor Road
- Watercourse
- Waterbody

Notes

1. Coordinate System: NAD 1983 CSRS MTM 10
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Orthoimagery © First Base Solutions, 2021. Imagery Date, 2019.

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Stantec

Project Location
Regioan Municipality of Durham

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Prepared by BCC on 2023-06-27
Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
ES.1

Title
Project Overview

Assessment of Potential Effects and Proposed Mitigation Measures

A series of environmental technical studies were undertaken as part of this EPR Addendum process to update existing conditions that were assessed as part of the 2011 EPR and to address the requirements of O. Reg. 231/08 Section 16. Section 16 requires a review of existing environmental conditions if a transit project has not commenced construction within 10 years of the Statement of Completion submission.

Following identification of existing conditions, potential environmental effects resulting from the construction and operation of the Project components were identified, analyzed, and described based on potential changes to the biophysical, social and economic and cultural environments. An assessment of potential effects and proposed mitigation measures was completed based on the following information:

- An assessment and evaluation of the potential effects that the Project may have on the environment
- A description of any measures proposed to mitigate any negative effects that the Project may have on the environment
- A description of the means to monitor or verify the effectiveness of the proposed mitigation measures to reduce or eliminate adverse effects

Section 5.0 of this report presents the conclusions of the effects assessment in more detail, and Section 5.10 highlights potential effects, mitigation measures, and monitoring requirements. Potential effects to matters of provincial importance, as defined in Ontario Regulation 231/08, that relate to the natural environment or having cultural heritage value or interest are specifically assessed in Sections 5.1 and 5.9, respectively. The potential effects of the Project are well understood and can be addressed through the proposed mitigation measures.

The following table (Table ES.1) is a summary of potential effects associated with the proposed Project that will require mitigation measures, and anticipated monitoring activities. Refer to Section 5.10 for details regarding mitigation measures and monitoring.

Table ES.1: Potential Effects, Mitigation Measures and Monitoring

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment	Aquatic Environment	• Removal or impacts to wetland; aquatic and riparian vegetation; headwater drainage features; degradation of wetlands as result of dewatering and discharge activities; erosion and sedimentation to wetlands/waterbodies from construction; and risk of contamination to wetlands/waterbodies as a result of spills	Potential effects anticipated	No potential effect anticipated	Linear Facilities Bridges GO Station Locations	• Construction activities will maintain the buffers established during the design phase to reduce potential negative impacts to wetlands and waterbodies. • Shorelines or banks disturbed by construction activities will be immediately stabilized by any activity associated with the Project to prevent erosion and/or sedimentation, preferably re-vegetation with native species suitable for the site. • An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019), will be prepared prior to and implemented during construction to reduce the risk of sedimentation to the waterbody. • A Spill Prevention and Response Plan will be developed before work commences so that procedures and policies are in place during construction to reduce impacts to wetlands and watercourses. • In wetland areas where vernal pooling occurs, prior to dewatering isolated work areas, wildlife will be captured and relocated to suitable habitat outside of the work area under a Wildlife Scientific Collector's Authorization from the Ministry of Natural Resources and Forestry (MNRF). If applicable, fish will be collected in accordance with the *Fisheries Act.* • Vegetation removals will also consider and mitigate potential impacts to wetland communities. Until such a time, that an Ontario Wetland Evaluation System (MNR 2014) evaluation is completed and evaluated by MNRF, unevaluated wetlands will be considered as significant for the purposes of assessing impacts. • Wetland communities potentially affected by the Project will be clearly staked out on site. • If dewatering is proposed, then it is recommended to be undertaken during the winter when the potential impacts of changes in water levels are less significant in wetland communities. During detailed design, the need for a dewatering zone of influence assessment and dewatering monitoring plan should be evaluated. The dewatering monitoring plan, if required, will monitor for potential negative impacts on nearby wetlands and adjacent vegetation communities to confirm if they would be affected due to dewatering activities. An adaptive management plan will be prepared if negative impacts are observed. • Prior to dewatering isolated work areas, fish will be captured and relocated to suitable habitat outside of the work area under a Licence to Collect Fish for Scientific Purposes from the MNRF. Similarly, wildlife will be captured and relocated to suitable habitat outside of the work area under a Wildlife Scientific Collector's Authorization from the MNRF.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include alteration of activities to reduce impacts and enhance mitigation measures.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Aquatic Environment	• Dewatering activities and water discharge resulting in changes in water velocity or temperature; changes in soil and erosion; release of contaminated and sediment-laden water; changes in fish habitat structure and cover; changes in food supply, changes in nutrient concentration; changes in access to habitat leading to the displacement or stranding of fish	Potential effects anticipated	No potential effect anticipated	Linear Facilities Bridges	• All requirements of the *Fisheries Act* will be met. • Headwater Drainage Features will be protected in accordance with the PPS (2020) and CLOCA Policies and Regulations. • Consideration will be given to mitigating short and long-term water quality impacts to the McLaughlin Bay will be mitigated through, for example, the implementation of an ESC plan, adequate stormwater management measures and riparian vegetation planting. • In the event that in-water and/or near water construction works are required, appropriate mitigation measures will be followed, as identified in Applicable Law and through consultation with the relevant authorities including DFO. In-water works will be planned to consider timing windows to protect fish, including their eggs, juveniles, community composition, spawning adults, and/or the organisms upon which they feed. The timing windows were confirmed with MNRF and CLOCA. Based on guidance from the MNRF (2013) and CLOCA's Fishery Management Plan (CLOCA 2013b) the restricted timing windows for in-water activities (i.e., when in-water work is not permitted) are as follows: – Goodman Creek (Watercourse Crossing Location (WC-1) - March 15 to July 15 – Oshawa Creek (WC-2) - September 15 to July 15 – Harmony Creek (WC-3) - September 15 to July 15 – Farewell Creek (WC-4) - September 15 to July 15 – Unnamed Tributary of Lake Ontario in proximity to the rail corridor and west of Prestonvale Road (WC-5) - March 15 to July 15 – Robinson Creek (WC-6) - September 15 to July 15 – Tooley Creek and tributaries in proximity to the rail corridor and west of Courtice Road and north of Baseline Road West (WC-7 and WC-9) - March 15 to July 15 – Tooley Creek (WC-8) - September 15 to July 15 – Darlington Creek (WC-11) - September 15 to July 15 • Darlington Creek tributaries in proximity to the rail corridor and south of Baseline Road West; east of Holt Road; and east of Maple Grove Road (WC-10, WC-12, WC-13 and WC-14) - March 15 to July 15	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. • Monitoring of dewatering activities will be undertaken to confirm sediment-laden discharge; and changes in visible scour/erosion.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Aquatic Environment	• Stormwater runoff from the rail corridor has the potential to effect surface water quality draining to watercourses, as there is an increased potential for runoff to contain contaminants resulting from management activities (e.g., herbicides, etc.) • Erosion and sedimentation to wetlands/waterbodies from maintenance activities; and risk of contamination to wetlands/waterbodies as a result of spills	No potential effects anticipated	Potential effects anticipated	Linear Facilities Bridges	• An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019), will be prepared prior to and implemented during maintenance activities to reduce the risk of sedimentation to the waterbody. - A Spill Prevention and Response Plan will be developed before work commences so that procedures and policies are in place during maintenance activities to reduce impacts to wetlands and watercourses.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include alteration of activities to reduce impacts and enhance mitigation measures.
	Aquatic Environment	• Potential for temporary impact to wetlands, headwater drainage features, waterbodies and fish habitat during culvert maintenance or culvert replacements	No potential effects anticipated	Potential effects anticipated	Linear Facilities Bridges	• Prepare and implement sediment and erosion control plan for any maintenance activities in or adjacent to wetlands, waterbodies, and headwater drainage features. • Wildlife passage analysis (e.g., openness ratio) of all structures within natural heritage systems will be conducted to determine existing conditions to help guide detailed design of new structures (including extensions).	• Regular on-site inspections during in-water construction by a qualified environmental inspector. • Post construction monitoring to confirm conditions with respect to wildlife passage opportunities.
	Aquatic Environment	• Potential for temporary impact to fish and fish habitat during culvert maintenance or culvert replacements	No potential effects anticipated	Potential effects anticipated	Linear Facilities	• Prepare and implement an Erosion and Sediment Control Plan for any maintenance activities below the ordinary high water mark. • Implement measures to protect fish and fish habitat during in-water construction activities i.e., restricted timing window, fish relocation. • Fish passage analysis (e.g., 2-year storm event/bankfull) of all structures in the Natural Environment Assessment Area will be conducted to determine existing conditions to help guide detailed design of new structures (including extensions).	• Regular on-site inspections during in-water construction by a qualified environmental inspector. • Post construction monitoring to confirm conditions with respect to fish passage.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Terrestrial Environment	• Removal of vegetation communities • Damage to adjacent vegetation or ELC communities as a result of accidental intrusion	Potential effects anticipated	No potential effects anticipated	All Project Components	• Vegetation removal will be avoided and limited to the Metrolinx right-of-way to the extent possible. • Compensation for tree removals will be undertaken in accordance with provisions outlined in Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Construction fencing and/or silt fencing, where appropriate, will be installed and maintained to clearly define the construction footprint and prevent accidental damage or intrusion to adjacent vegetation or ELC communities. • Provide compensation for the removal of vegetation in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Provide compensation for disturbed or removed wetlands based on Metrolinx guidelines and in consultation with CLOCA. • Temporarily disturbed areas will be re-vegetated using non-invasive, native plantings and/or seed mix, appropriate to the site conditions and adjacent vegetation communities. Seed mixes will be used in conjunction with an appropriate non-invasive cover crop as needed. • Vegetation removals will also consider and mitigate potential impacts to sensitive species (e.g., migratory birds and SAR) and features (e.g., SWH). Refer to the mitigation measures for the Wildlife, SWH and SAR Environmental Components described below.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. • If required as a condition of a permit or approval associated with governing by-laws/regulations, vegetation compensation activities will be monitored in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction).
	Terrestrial Environment	• Removal of vegetation during operations vegetation maintenance activities, if applicable • Removal and/or damage to adjacent vegetation or ELC communities as a result of accidental intrusion during vegetation maintenance activities, if applicable	No potential effects anticipated	Potential effects anticipated	All Project Components	• Vegetation removal will be avoided and limited to the Metrolinx right-of-way to the extent possible. • Sensitive wildlife timing restrictions will be followed for construction activities and operational maintenance activities (e.g., removal of vegetation outside of the breeding bird season). • Herbicide applications will be administered subject to the *Pesticides Act*. • Temporarily disturbed areas will be re-vegetated using non-invasive, preferable native plantings and/or seed mix.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. • Monitoring and management of trees/vegetation in the rail corridor right-of-way will be undertaken in accordance with the Integrated Vegetation Management (IVM) Program within the Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction).
	Terrestrial Environment	• City and private tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• An Arborist Report will be prepared by an International Society of Arboriculture (ISA) Certified Arborist which meets regulatory requirements. The Arborist Report will be completed with regard to Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction), *Ontario Forestry Act* R.S.O. 1990, the ESA, 2007, and other regulations, municipal by-laws and best management practices as applicable.	• Regular inspection in areas of vegetation removal will be undertaken as required during construction to confirm that fencing is intact; only specified trees are removed; and no damage is caused to the remaining trees and adjacent vegetation communities.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Terrestrial Environment	• City and private tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• The Arborist Report will include, but not be limited to, the individual identification of trees within the Project Footprint, including those that require removal or preservation, or trees that may be injured as a result of the Project. Trees to be identified within the Project Footprint may include those on Metrolinx property, trees on public and private lands, and boundary trees. Municipal by-laws dictate the minimum area buffers to be inventoried and DBH that requires inventory as well as additional requirements for tree inventories and tree protection plans. • The Arborist Report will include all information needed to establish compensation ratios and tree end use (including identification of high value trees) as per Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Prior to the undertaking of tree removals, a Tree Removal Strategy/Preservation Plan, building upon the considerations and elements set out in Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction), will be developed during detailed design to document tree protection and mitigation measures that follow municipal by-laws and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections. • If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2022), and subsequent amendments. Applicable bylaws will be followed. • Pruning of branches will be conducted by staff trained to employ proper pruning techniques as identified by the International Society of Arboriculture and Landscape Ontario. • Metrolinx will adhere to all applicable bylaws and regulations for tree removals outside of Metrolinx properties. • Pruning of branches will be conducted by staff trained to employ proper pruning techniques as identified by the International Society of Arboriculture and Landscape Ontario. • Tree Protection Zone (TPZ) fencing will be established to protect and prevent tree injuries. TPZs will be clearly staked prior to construction using barriers in accordance with local by-law requirements. • Vegetation restoration and planting plans will be shared with Indigenous communities for feedback. • Upon receiving the necessary Project approvals and prior to the commencement of tree removals, all trees designated for preservation must be flagged in the field. All designated preservation areas must be left standing and undamaged during site works. • Vegetation removal will be avoided and limited to the Metrolinx properties and ROW to the extent possible. • Vegetation removals will also consider and mitigate potential impacts to sensitive species, e.g., migratory birds and SAR, and features, e.g., designated natural areas and SWH. Refer to the mitigation measures for the Wildlife, SWH and SAR Environmental Components described above.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. • If required, the success of vegetation compensation activities will be monitored in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning. • Monitoring requirements will be undertaken in accordance with conditions of permits and approvals. • Monitoring and management of trees/vegetation within the rail corridor ROW will be undertaken in accordance with the IVM Program.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Terrestrial Environment cont.	• City and private tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• Removals are to be completed outside of migratory bird nesting season from, approximately, April 1 to August 31. Removals may take place during this restricted time only if the requirements of the MBCA are met and nesting activity is routinely monitored by qualified individuals (i.e., Wildlife Biologists). • The following is the process that shall be carried out if tree removals are requested during the restricted time indicated in the MBCA: - Contact a qualified individual (i.e., wildlife biologist or ornithologist) to determine if nesting birds are within the tree removal disturbance area. Nest searches are required and will be completed by a qualified wildlife biologist or ornithologist no more than 48 hours prior to vegetation removal and no earlier than 7 days prior to the activity. - If the wildlife biologist / ornithologist has determined that there are nesting birds onsite, there will be no tree removals/chipping conducted within the boundary set out by the specialist. Tree removals can resume within this area at the end of the nesting season, August 31, or if the wildlife biologist / ornithologist has determined the birds have left the nest. - If the wildlife biologist / ornithologist determines there are no migratory birds nesting within the disturbance area, the Contractor has 7 days to conduct removals. At the end of 7 days, if removals and chipping is not complete, the wildlife biologist / ornithologist will return to the site and proceed with another assessment. If there are still no birds, work can resume for another 7 days. This process will continue until all removals and chipping is complete. • Upon completion of the tree removals, all felled trees are to be removed from the site. No lumber or brush from the clearing is to be stored on the site. Any chipping, cutting or brush cleanup are to be completed outside of the bird nesting season. These works may take place during this restricted time only if the requirements of the MBCA are met and nesting activity is routinely monitored by qualified individuals (i.e., wildlife biologists or ornithologists).	
	Terrestrial Environment	• Footprint impacts and potential for the establishment of invasive species and other incompatible species on integrated vegetation management (IVM)	Potential effects anticipated	No potential effects anticipated	All Project Components	• An IVM Plan will be developed and implemented that is in adherence with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction) and the IVM Program. The Guideline's selection criteria will be used to assess the vegetation present as compatible or incompatible, and manage it, if necessary, in a way which meets safety needs in a timely manner, is sensitive to environmental conditions, and enhances cost-effectiveness.	• The presence, density, and location of compatible and incompatible species will be monitored as per the frequency and methodology established in the Bi-Annual Monitoring Program within Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). The Bi-Annual Monitoring Program is made up of pre-treatment and post-treatment monitoring that will be carried out by field survey, by aerial survey, and by high-rail vehicle or train surveys conducted by qualified specialists.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Terrestrial Environment	• Potential for the spread of Emerald Ash Borer, *Agrilus planipennis* (Fairmaire) when removing, handling, and transporting ash trees	Potential effects anticipated	No potential effects anticipated	All Project Components	• Removal of ash trees, or portions of ash trees, will be carried out in compliance with the Canada Food and Inspection Agency Directive D-03-08: Phytosanitary Requirements to Prevent the Introduction into and Spread within Canada of the Emerald Ash Borer (2014), as amended from time to time. To comply with this Directive, ash trees requiring removal, including wood, bark or chips, will be restricted from being transported outside of the emerald ash borer regulated areas of Canada. • Precautions will be taken to reduce the risk of the spread of invasive species by cleaning equipment prior to moving sites.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
	Terrestrial Environment	• Increased erosion and sedimentation	Potential effects anticipated	No potential effects anticipated	All Project Components	• Construction fencing will be installed and maintained to clearly define the construction footprint and prevent accidental damage or intrusion into adjacent designated natural heritage features, vegetation / ecological communities or habitat features. Further, silt fencing will be installed and maintained surrounding any potential watercourses or swales to prevent soil erosion / sedimentation to surrounding sensitive features such as valleylands, watercourses and/or wetland features. • Monitoring of the fencing will be conducted in accordance with the best practices outlined in the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019). The Erosion and Sediment Control Guide for Urban Construction (TRCA 2019) recommends inspections be conducted on a weekly basis at minimum during active construction. Other recommendations for inspections are also outlined in the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019). • As specified in the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019), it is recommended that “damaged ESC measures be repaired and/or replaced within 48 hours or sooner if environmental receptors are at imminent and foreseeable risk of adverse impact”. • An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019) will be prepared prior to and implemented during construction to reduce the risk of sedimentation to the vegetation communities. • Stockpiled materials or equipment will be stored within the construction footprint but shall be kept at least 30 m away from any watercourse; signs will be put up on site to indicate the setback. • The Environmental Inspector shall possess a Certified Inspector of Sediment and Erosion Control (CISEC) or Certified Professional in Erosion and Sediment Control (CPESC) certificate, and the preparation and implementation of Erosion and Sediment Control Plan(s) shall be in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA, 2019).	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. All ESC measures should be inspected weekly. All damaged ESC Measures will be repaired and/or replaced within 48 hours of the inspection. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Terrestrial Environment	• Soil or water contamination as a result of spills (e.g., grease and/or fuel) from equipment use • Introduction or spread of invasive species	Potential effects anticipated	No potential effects anticipated	All Project Components	• A Spill Prevention and Response Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and Spill Prevention and Response Plan. • Refuelling of equipment will occur at least 30 m away from any watercourse. Signs will be put up on site to indicate the 30 m setback from any watercourse. • Refuelling will be done within refuelling stations lined with appropriate material to prevent seepage and fuel discharge. • All machinery, construction equipment and vehicles arriving on site should be in clean condition (e.g., free of fluid leaks, soils containing seeds of plant material from invasive species) and inspected and washed in accordance with the Clean Equipment Protocol for Industry (Halloran et al., 2013) prior to arriving and leaving the construction site. This will reduce the risk of the spread of invasive species to other locations.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include, training for on-site personnel, additional site maintenance and alteration of activities to reduce impacts. • Precautions are being taken to reduce the risk of the spread of invasive species by implementing the Clean Equipment Protocol for Industry (Halloran et al. 2013) on equipment and machinery prior to arriving on a site.
	Terrestrial Environment	• Soil or water contamination as a result of spills (e.g., grease and/or fuel) from equipment use during maintenance activities	No potential effects anticipated	Potential effects anticipated	All Project Components	• A Spill Prevention and Response Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the Spill Prevention and Response Plan. • Refuelling of equipment will occur at least 30 m away from any watercourse. • Refuelling will be done within refuelling stations lined with appropriate material to prevent seepage and fuel discharge. • All machinery, construction equipment and vehicles arriving on site should be in clean condition (e.g., free from fluid leaks, soils containing seeds of plant material from invasive species) and be inspected and washed in accordance with the Clean Equipment Protocol for Industry (Halloran et al. 2013) prior to arriving and leaving the construction site in order to prevent the spread of invasive species to other locations.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
	Wildlife	• Disturbance, displacement, or mortality of wildlife	Potential effects anticipated	Potential effects anticipated	All Project Components	• If wildlife is encountered, measures will be implemented to avoid death, injury, or interference with the species, and its habitat. For example, construction activities will cease, or be reduced, and wildlife will be encouraged to move off-site and away from the construction area on its own. A qualified biologist will be contacted to advise on the appropriate actions for the situation. • Prior to construction, investigation of the Project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken by a qualified biologist, as appropriate. • The contractor will be in adherence with DFO's Code of Practice: Beaver Dam Breaching and Removal.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Wildlife	• Disturbance or destruction of migratory bird nests	Potential effects anticipated	Potential effects anticipated	All Project Components	• All works must comply with the *Migratory Birds Convention Act*, 1994 (MBCA), including timing windows for the nesting period (April 1 to August 31). • Operations will occur outside of the nesting period where feasible. However, if operations or vegetation maintenance must occur during the general nesting period, then a breeding bird and nest survey will be undertaken prior to required activities. Nest searches are required and will be completed by a qualified wildlife biologist or ornithologist no more than 48 hours prior to vegetation removal and no earlier than 7 days prior to the activity. • If a nest of a migratory bird is found outside of this nesting period (including a ground nest), it still receives protection. • If the nest of a bird listed under Schedule 1 of the Migratory Birds Regulations (2022) is found in the Project area, the nest will be registered under the Abandoned Nest Registry. • Three active Barn Swallow nests were observed in one of the culverts associated with Darlington Creek in the Project Footprint, just east of Rundle Road. Nests must be protected (works will not occur that may damage or destroy the nest) between May 1 and August 31 (residency occupancy period).	• Regular monitoring will be undertaken by a qualified biologist to confirm that activities do not encroach into nesting areas or disturb active nesting sites.
	Wildlife	• Decrease of habitat connectivity for wildlife. • Reduction in ecological function, habitat quality and integrity • Removal of/or damage to trees, terrestrial vegetation and wildlife habitat	Potential effects anticipated	No potential effects anticipated	All Project Components	• Opportunities to enhance the natural environment and provide a connection to the surrounding natural areas will be explored, to the extent possible. • Indigenous communities will be invited to provide input to discussions regarding potential habitat connectivity opportunities, as part of vegetation restoration planning.	• Refer to monitoring described for vegetation communities, wildlife and wildlife habitat and aquatic environment.
	Significant Wildlife Habitat	• Disturbance, displacement, or mortality of wildlife or habitat loss for SWH	Potential effects anticipated	No potential effects anticipated	All Project Components	• Prior to construction, investigation of the Project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken, as appropriate. • Mitigation measures specific to SWH for monarchs, turtles, and Eastern Milksnake are provided as separate entries within this table. • Impacts to candidate shrub/early successional bird breeding habitat, candidate terrestrial crayfish habitat and candidate Yellow-banded Bumble Bee habitat can be addressed using the mitigation measures described above in the Vegetation Communities section. Impacts to candidate shrub/early successional bird breeding habitat can also be mitigated using measures outlined below for migratory birds.	• Monitoring activities specific to each SWH are detailed in the wildlife and wildlife habitat sections below, and in the section references for candidate bat maternity colonies, candidate shrub/early successional bird breeding habitat, candidate terrestrial crayfish habitat and candidate Yellow-banded Bumble Bee habitat in the adjacent column.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Significant Wildlife Habitat	• Disturbance or destruction of habitat used by monarchs	Potential effects anticipated	No potential effects anticipated	GO Station Locations	• Identify opportunities to promote pollinator species and habitat in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). This may include planting or seeding native flowering plants in temporarily disturbed areas. • Opportunities to plant milkweed or forage vegetation outside and within the rail ROW will be considered, where possible, and in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • If vegetation clearing proceeds when monarch larvae may be present (April 1 to September 30), then milkweed plants should be inspected by a qualified professional for monarch larvae prior to their removal. If larvae are present, they may be moved to a location that is suitable and safe under the direction of a qualified biologist. Monarch caterpillars may be moved to other milkweed plants; for other larval stages (i.e., eggs and chrysalis), entire milkweed plants will be transplanted.	• Regular monitoring will be undertaken during construction to prevent unauthorized impacts to habitats used by monarchs.
	Significant Wildlife Habitat	• Potential for impacts to turtles and/or turtle habitat	Potential effects anticipated	No potential effects anticipated	Bridges	• Work within turtle habitat will be planned in consideration of turtle overwintering period which occurs from October 1 to April 30. Mitigation measures to prevent turtles from nesting on site may need to be implemented prior to work activities. • Wildlife exclusionary fencing will be installed and maintained around the construction zone near any potential sensitive herpetofauna habitat such as valleylands, watercourses and/or wetland features. The contract specifications will follow best management practices (MNRF 2013). • The contractor will develop an Amphibian and Reptile Management Plan. • The Amphibian and Reptile Management Plan will be circulated to Indigenous communities for comment. • Fencing designs will be circulated to Indigenous communities for comment. • Post-construction habitat restoration will be implemented, as required.	• Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
	Significant Wildlife Habitat	• Potential for direct impacts to Eastern Milksnake	Potential effects anticipated	No potential effects anticipated	All Project Components	• Snake species, including Eastern Milksnake, have the potential to enter the work area during the active season for snakes (April 1 to October 31) • Mitigation measures for wildlife encounters (as outlined in the Wildlife and Wildlife Habitat section above) will be implemented, as required.	• Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	SAR - General	• Disturbance, displacement, or mortality of SAR or SAR habitat	Potential effects anticipated	No potential effects anticipated	All Project Components	• All requirements of the *Endangered Species Act* (ESA, 2007), Fisheries Act (1985) and *Species at Risk Act, 2002* (SARA) will be met. Species-specific mitigation measures will be implemented based on any recommended surveys undertaken prior to construction, and consultation with MECP and MNRF. MECP will be consulted to confirm permitting requirements under the ESA, 2007. • If SAR is present and a recovery strategy has been developed by MNRF and MECP, Metrolinx will follow the commitments in the recovery strategy. • On-site personnel will be provided with information (e.g., factsheets and training) that addresses the existence of potential SAR on site, the identification of the SAR species and the procedure(s) to follow if an individual is encountered or injured. • Mitigation measures to reduce adverse impacts of Project activities on SAR will comply with the ESA, 2007. • If SAR are encountered, construction activities in the area will cease immediately and a qualified biologist will be contacted. The SAR must be allowed to leave the area on its own accord. Construction activities will not proceed until the SAR is safely away from the area. If the SAR does not leave the area on its own in a timely manner, a qualified biologist with training in proper handling of SAR may be permitted to relocate the SAR safely away from the construction area. • Any SAR individual that is encountered in the Natural Environment Assessment Area must be reported to the MECP (SAROntario@ontario.ca) within 48 hours of the observation. • Prior to construction, investigation of the Project Footprint for SAR that may have established following the completion of previous surveys may be undertaken by a qualified biologist, as appropriate.	• Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional mitigation measures may also be implemented if those proposed are not effective. • Species-specific monitoring activities will be developed in accordance with any registration and permitting requirements under the ESA, 2007. • Monitoring activities to reduce adverse impacts of Project activities on SAR will comply with the ESA, 2007.
	SAR – Bobolink and Eastern Meadowlark	• Habitat loss, disturbance, and/or mortality to Bobolink and Eastern Meadowlark	Potential effects anticipated	No potential effects anticipated	Linear Facilities GO Station Locations	• Additional monitoring, mitigation and compensation for removal of suitable Bobolink and Eastern Meadowlark habitat may be required, based on consultation with the MECP. • Mitigation measures to reduce adverse impacts of Project activities on Bobolink and Eastern Meadowlark will comply with the ESA, 2007. • Disturbance to Bobolink and Eastern Meadowlark habitat will be avoided during the breeding bird window between May 1 to July 31, as per O. Reg. 242/08 of the ESA, 2007.	• Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on Bobolink and Eastern Meadowlark will comply with the ESA, 2007.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	SAR – Chimney Swift	• Habitat loss, disturbance, and/or mortality to Chimney Swift	Potential effects anticipated	No potential effects anticipated	Bridges	• Additional monitoring, mitigation and compensation for removal of suitable anthropogenic roosting habitat may be required, based on consultation with the MECP. • Mitigation measures to reduce adverse impacts of Project activities on Chimney Swift will comply with the ESA, 2007. • Disturbance to Chimney Swift habitat will be avoided during the active season, which includes breeding, nesting, rearing and roosting, beginning end of April and to the middle of October, as per O. Reg. 242/08 of the ESA, 2007.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on Chimney Swift will comply with the ESA, 2007.
	SAR – Blanding's Turtle	• Potential for impacts to Blanding's Turtle and/or Blanding's Turtle habitat	Potential effects anticipated	No potential effects anticipated	Bridges	• All requirements of the ESA, 2007 will be met. In consultation with the MECP, additional surveys may be required to verify the presence or absence of SAR and confirm permitting requirements under the ESA, 2007. • Work within potential Blanding's Turtle habitat should consider the turtle overwintering period which occurs from October 1 to April 30, and the nesting period which occurs from late May to early July. • Mitigation measures to reduce adverse impacts of Project activities on Blanding's Turtle will comply with the ESA, 2007.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on Blanding's Turtle will comply with the ESA, 2007.
	SAR – Bats	• Habitat loss, disturbance, and/or mortality to SAR bats	Potential effects anticipated	Potential effects anticipated	All Project Components	• All requirements of the ESA, 2007 will be met. In consultation with the MECP, additional surveys may be required to verify the presence or absence of SAR and confirm permitting requirements under the ESA, 2007. • Additional monitoring, mitigation and compensation for removal of suitable treed or anthropogenic roosting habitat may be required, based on the results of additional surveys and consultation with the MECP. • Removal of identified roosting structure/habitat would be discussed in advance with the MECP and requirements of the ESA, 2007 will be met. • Disturbance to bat roosting habitat will be avoided during the bat roosting period of April 1 to September 30, in accordance with MECP requirements. • Mitigation measures to reduce adverse impacts of Project activities on SAR bats will comply with the ESA, 2007.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on SAR bats will comply with the ESA, 2007.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	SAR – Butternut (Tree B-002 has been visually identified as pure. Genetic testing is underway to confirm purity.)	• Habitat loss, disturbance, and/or mortality of butternut	Potential effects anticipated	No potential effects anticipated	Linear Facilities Bridges	• As part of the Arborist Report, trees within or adjacent to the Project Footprint that will be removed or injured as part of the Project will be inventoried, including butternut and other SAR vegetation. SAR vegetation will be subject to permitting and approval requirements under the ESA, 2007, prior to the commencement of construction. • If any works are proposed within the critical root zone (i.e., 25 m radius from stem) or its regulated habitat (i.e., 50 m radius from stem) of a butternut, mitigation, monitoring and compensation to address impacts to butternuts will be required based on the results of a Butternut Health Assessment in accordance with the ESA, 2007. • Each butternut that may potentially be removed or impacted must be assessed by a Butternut Health Expert, in accordance with MECP Butternut Assessment Guidelines (2021e). The Butternut Health Expert will prepare a butternut health assessment report and document the mitigation monitoring and corrective actions implemented. • Mitigation measures to reduce adverse impacts of Project activities on butternut will comply with the ESA, 2007.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on butternut will comply with the ESA, 2007.
	Significant Natural Features	• Localized losses of habitat which may support local wildlife populations and SAR • Reduction in habitat quality resultant from increases in light, noise pollution and dust generation • Potential reduction in habitat quality and Natural Heritage System (NHS) ecosystem resilience related to edge habitat and invasive species introduction and proliferation • Potential reduction in species movement throughout the NHS corridor	Potential effects anticipated	No potential effects anticipated	All Project Components	• Compensatory habitat and mitigation measures including avoidance of invasive species introduction as well as on-going invasive species management will be determined during consultation with agency stakeholders (Municipalities and CLOCA). • The contractor will develop an Invasive Species Management Plan. • The Invasive Species Management Plan will be circulated to Indigenous communities for comment. • Fencing designs will be circulated to Indigenous communities for comment.	• Monitoring restoration areas and follow up management will be determined during consultation with agency stakeholders (Municipalities and CLOCA).

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Tree Inventory	Trees	• Damage to trees during construction, including soil compaction, root damage, and mechanical damage	Potential effects anticipated	No potential effects anticipated	All Project Components	• Trees shall not have any rigging cables or hardware of any sort attached or wrapped around them, nor shall any contaminants be dumped within the protective areas. Furthermore, no contaminants shall be dumped or flushed where they may come into contact with the feeder roots of the trees. In the event that roots from retained trees are exposed, or if it is necessary to remove limbs or portions of trees after construction has commenced, the Project Arborist shall be informed and the proper actions conforming to municipal policies and by-laws shall be carried out. • TPZ fencing will be established to protect and prevent tree injuries in accordance with local by-law requirements. Upon installation of the tree protection fencing, the Contractor shall contact the Project Arborist to review and approve the fencing and its location prior to commencement of any site work. This shall be coordinated with municipal staff for approval. The protection fencing shall remain intact throughout the entire protection. The fencing will be inspected weekly and, if required, repaired. The fencing shall be removed at the completion of all site works. • The TPZ is the area around a retained tree that is to be protected by tree protection fencing. The TPZ is not to be used for any type of storage (e.g., storage of debris, construction material, surplus soils, and construction equipment). No trenching or tunneling for underground services shall be located within the TPZ. Construction equipment shall not be allowed to idle or exhaust within the TPZ.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
	Trees	• Tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• An Arborist Report will be prepared by an ISA Certified Arborist which meets regulatory requirements. The Arborist Report will be completed with regard to Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction)., *Ontario Forestry Act* R.S.O. 1990, the ESA, 2007, and other regulations, municipal by-laws and best management practices as applicable. • The Arborist Report will include, but not be limited to, the individual identification of trees within the Project Footprint, including those that require removal or preservation, or trees that may be injured as a result of the Project. Trees to be identified within the Project Footprint may include those on Metrolinx property, trees on public and private lands, and boundary trees. Municipal by-laws dictate the minimum area buffers to be inventoried and DBH that requires inventory as well as additional requirements for tree inventories and tree protection plans. • The Arborist Report will include all information needed to establish compensation ratios and tree end use (including identification of high value trees) as per Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Prior to the undertaking of tree removals, a Tree Removal Strategy/Preservation Plan, building upon the considerations and elements set out in Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction), will be developed during detailed design to document tree protection and mitigation measures that follow municipal by-laws and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections.	• Regular inspection in areas of vegetation removal will be undertaken as required during construction to confirm that fencing is intact; only specified trees are removed; and no damage is caused to the remaining trees and adjacent vegetation communities. • On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. • If required, the success of vegetation compensation activities will be monitored in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning. • Monitoring requirements will be undertaken in accordance with conditions of permits and approvals.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Tree Inventory cont.	Trees	• Tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2022), and subsequent amendments. Applicable bylaws will be followed. • Metrolinx will adhere to all applicable bylaws and regulations for tree removals outside of Metrolinx properties. • TPZ fencing will be established to protect and prevent tree injuries. TPZs will be clearly staked prior to construction using barriers in accordance with local by-law requirements. • Vegetation restoration and planting plans will be shared with Indigenous communities for feedback. • Upon receiving the necessary Project approvals and prior to the commencement of tree removals, all trees designated for preservation must be flagged in the field. All designated preservation areas must be left standing and undamaged during site works. • Vegetation removal will be avoided and limited to Metrolinx properties and ROW to the extent possible. • Vegetation removals will also consider and mitigate potential impacts to sensitive species, e.g., migratory birds and SAR, and features, e.g., designated natural areas and SWH. Refer to the mitigation measures for the Wildlife, SWH and SAR Environmental Components described above. • Removals are to be completed outside of migratory bird nesting season from, approximately, April 1 to August 31. Removals may take place during this restricted time only if the requirements of the MBCA are met and nesting activity is routinely monitored by qualified individuals (i.e., Wildlife Biologists). • The following is the process that shall be carried out if tree removals are requested during the restricted time indicated in the MBCA: - Contact a qualified individual (i.e., wildlife biologist or ornithologist) to determine if nesting birds are within the tree removal disturbance area. Nest searches are required and will be completed by a qualified wildlife biologist or ornithologist no more than 48 hours prior to vegetation removal and no earlier than 7 days prior to the activity. - If the wildlife biologist / ornithologist has determined that there are nesting birds onsite, there will be no tree removals/chipping conducted within the boundary set out by the specialist. Tree removals can resume within this area at the end of the nesting season, August 31, or if the wildlife biologist / ornithologist has determined the birds have left the nest. - If the wildlife biologist / ornithologist determines there are no migratory birds nesting within the disturbance area, the Contractor has 7 days to conduct removals. At the end of 7 days, if removals and chipping is not complete, the wildlife biologist / ornithologist will return to the site and proceed with another assessment. If there are still no birds, work can resume for another 7 days. This process will continue until all removals and chipping is complete.	• Monitoring and management of trees/vegetation within the rail corridor ROW will be undertaken in accordance with the IVM Program.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Tree Inventory cont.	Trees cont.	• Tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• Upon completion of the tree removals, all felled trees are to be removed from the site. No lumber or brush from the clearing is to be stored on the site. Any chipping, cutting or brush cleanup are to be completed outside of the bird nesting season. These works may take place during this restricted time only if the requirements of the MBCA are met and nesting activity is routinely monitored by qualified individuals (i.e., wildlife biologists or ornithologists).	
Geology and Groundwater	Landforms and Physiography	• No effects to landforms or physiographic environmental components are anticipated as a result of construction activities or during operations.	No potential effects anticipated	No potential effects anticipated	All Project Components	• As no effects are anticipated, no mitigation measures are required.	• No monitoring activities are required.
	Soils	• Construction activities could expose contaminated materials and/or result in the spreading of contaminated materials	Potential effects anticipated	No potential effects anticipated	All Project Components	• Develop a Soil and Excavated Materials Management Plan (SEMMP) during Detailed Design for the handling, management and disposal of all excavated material (i.e., soil, rock and waste) that is generated or encountered during the Works. The plan will be overseen by a Qualified Person (QP) pursuant to O. Reg. 153/04 under the *Environmental Protection Act* and will comply with O. Reg. 406/19 (On-Site and Excess Soil Management), the MECP, formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices, (MECP 2021b) and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. • Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per O. Reg. 347 (as amended) and All Applicable Law. • The SEMMP will be reviewed and approved by Metrolinx prior to construction.	• A Soil and Excavated Material Monthly Monitoring Report will be submitted by the Constructor for Metrolinx review on a monthly basis that includes monitoring and performance data related to the management of excavated materials. • Upon completion of the work, the Constructor will submit a Soil and Excavated Material Management Implementation Report to Metrolinx

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Geology and Groundwater cont.	Groundwater Resources	• Construction could expose groundwater associated contamination	Potential effects anticipated	No potential effects anticipated	GO Station Locations Bridges	• Develop a Groundwater Management and Dewatering Plan (GMDP) during Detailed Design to guide the handling, management, and disposal of groundwater encountered during the Works. The GMDP will be overseen by a QP and will comply with O. Reg. 406/19 (On-Site and Excess Soil Management), 64/16 and 387/04, as amended under the *Ontario Water Resources Act*. • The GMDP will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the Works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMDP will outline general groundwater monitoring considerations during the Works and provide guidance for groundwater monitoring following the Works where considered applicable. • The GMDP will describe the anticipated groundwater quantity and dewatering Zone of Influence (ZOI) that will be encountered during the Works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) from the MECP, or an Environmental Activity and Sector Registry (EASR). • The GMDP will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the Works, and approvals for the water disposal, and or treatment if applicable based on the quantity and quality. • The GMDP will be reviewed and approved by Metrolinx prior to construction. • Potential impacts to groundwater-dependent natural features and/or private groundwater supply wells (if present) can be mitigated with measures such as avoidance of dewatering requirements, minimizing dewatering, and/or utilizing groundwater cut-off techniques to physically exclude groundwater from flowing into excavations advanced for construction.	• A Groundwater Management Monthly Dashboard Report will be developed by the Constructor for Metrolinx review to document performance monitoring data/results and any corrective actions implemented during the previous month. • Upon completion of the work, the Constructor will submit a Groundwater Management and Dewatering Implementation Report to Metrolinx.
	Groundwater Resources	• Accidental spills and releases during construction activities may affect groundwater through contamination	Potential effects anticipated	No potential effects anticipated	All Project Components	• A Spill Prevention and Response Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the response plan. • Refuelling of equipment will occur at least 30 m away from any watercourse. • Refuelling will be done within refuelling stations lined with appropriate material to prevent seepage and fuel discharge. • All machinery, construction equipment and vehicles arriving on site should be in clean condition (e.g., free from fluid leaks, soils containing seeds of plant material from invasive species) and be inspected and washed in accordance with the Clean Equipment Protocol for Industry (Halloran et al. 2013) prior to arriving and leaving the construction site in order to prevent the spread of invasive species to other locations.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Stormwater Management	SWM	• The proposed construction activities pose a potential impact due to sediment transport into adjacent natural areas including watercourses, wetlands and municipal drainage infrastructure • The proposed works may result in increases to impervious areas, with potential effects to water quantity and quality • In addition to the increases in impervious coverage, there may be alterations to the local drainage system, both overland (major drainage system) and storm sewers (minor drainage system)	Potential effects anticipated	Potential effects anticipated	All Project Components	• Prepare and implement a Drainage and SWM Report, an Erosion and Sediment Control Plan, detailed drainage design and ESC drawings in accordance with the MECP Stormwater Management Planning and Design Manual (2003), the Toronto and Region Conservation Area's Erosion and Sediment Control Guideline for Urban Construction (2019), as amended from time to time, the MECP Low Impact Development Stormwater Management Guidance Manual (draft) (2022) and the guidelines and regulatory requirements of CLOCA. • The following stormwater management best management practices will be considered and implemented, as required: - Reduce clearing and amount of exposed soil; - Install key sediment control before grading/land alterations begin; - Sequence construction activities so that the soil is not exposed for long periods of times; - Protect storm drain inlets to filter out debris; and, - Stabilize all exposed soil areas as soon as land alterations have been completed. • The overall stormwater quality and quantity control strategy will be developed in accordance with all relevant municipal, provincial and federal requirements, as amended, as well as the requirements of Conservation Authorities having jurisdiction. • A detailed assessment of proposed ditches along the rail corridor is required to provide adequate drainage conveyance in accordance with municipal requirements, Metrolinx Standards and American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering (latest revision). • Infiltration requirements will be determined as per the applicable municipal, provincial, and CLOCA design guidelines and standards. • Any proposed bridges and culvert replacements will be sized to maintain or improve local flood levels and supported by hydrologic/hydraulic calculations and/or models. Creek bed and banks design will include geomorphological input for scour and erosion prevention, and creation of appropriate fish habitat. • A hydraulic assessment of each crossing and any proposed bridges is required to determine proposed flood levels and associated creek bed and bank treatments to prevent scour and erosion and facilitate fish passage. Where applicable, the regulatory model(s) will be obtained from the local Conservation Authority to assess the hydraulic impacts along regulated watercourses. • Develop and implement a Spill Prevention and Response Plan in accordance with the Project Agreement. • The Project will be designed and constructed in accordance with hydraulic assessment recommendations to manage the potential for adverse impacts on existing flood hazards and risks.	• Plans to be developed and implemented include: – Stormwater Management & Drainage Design Report – Erosion and Sediment Control Plan – Spill Prevention and Response Plan • Monitoring activities will be implemented as outlined in the Stormwater Management Plan and/or Erosion and Sediment Control Plan and may include regular inspections and reporting on the performance of implemented ESC measures, best management practices, and other monitoring activities, as required. • All monitoring procedures should stay in place throughout construction. • Turbidity levels within discharges from sites to be monitored visually. Turbidity levels will be monitored upstream and downstream of sites at watercourse crossings or adjacent to watercourses. The turbidity levels within site discharges and receiving storm sewers will also be monitored visually to determine potential impacts from construction. • Grab samples for existing watercourses and/or wetlands, when runoff from the site discharges to a watercourse and/or wetland will be conducted for pre-construction, during construction, and post construction conditions until the site is considered stabilized. Grab samples for watercourses and wetlands will be taken for non-precipitation event and for precipitation events to obtain a reasonable understanding of the turbidity levels. Post-construction monitoring of wetland areas may be required depending on input from Conservation Authorities. • Monitoring will be conducted for potential oil spills and containment of spills to be conducted as per provincial requirements. • Functionality of stormwater quantity controls including peak flows and water levels for storm events within the design range. Monitoring would require local rainfall data.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Stormwater Management cont.	SWM cont.	• The proposed construction activities pose a potential impact due to sediment transport into adjacent natural areas including watercourses, wetlands and municipal drainage infrastructure • The proposed works may result in increases to impervious areas, with potential effects to water quantity and quality • In addition to the increases in impervious coverage, there may be alterations to the local drainage system, both overland (major drainage system) and storm sewers (minor drainage system)	Potential effects anticipated	Potential effects anticipated	All Project Components		• Infiltration targets, measured by flow monitoring on infiltrative Low Impact Development (LID) Best Management Practices (BMP). • Stormwater quality measures will be assessed to provide a minimum 80% Total Suspended Solids (TSS) removal as per the MECP Stormwater Management
	Floodplain	• Potential to impact flooding conditions in the CLOCA Regulatory Floodplain • Potential for flooding impacts on-site during construction	Potential effects anticipated	No potential effects anticipated	Linear Facilities Bridges	• Floodplain impact assessment will be conducted during detailed design following CLOCA guidelines once details on the pier configuration and other detailed bridge design information are available. Design optimizations on abutment, pier, and embankment placement shall be considered to reduce hydraulic impacts. • CLOCA staff will be consulted during detailed design to avoid potential infrastructure conflicts and impacts to flood protection measures/initiatives. • In addition, all necessary studies such as fluvial geomorphic process studies, meander belt and erosion studies, and geotechnical and slope stability assessments will be completed. • Prior to construction, develop a Flood Contingency Plan with specific mitigation measures for any proposed works or temporary laydown and staging areas, as required. The Flood Contingency Plan may include risk mapping, and a monitoring strategy. • Include construction site on CLOCA flood warning system to prepare site in advance of possible flood events.	• Develop and undertake a monitoring program of the Floodplain, as required, in consultation with CLOCA. • Include a monitoring strategy in the Flood Contingency Plan to monitor surface water levels during construction activities.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Air Quality	Air Quality	• Construction-related air pollution (such as dust emissions, tailpipe emissions, and emissions from exposing contaminated materials) may pose risks to human health and wellbeing	Potential effects anticipated	No potential effects anticipated	All Project Components	• Prior to commencement of construction, develop and submit a detailed Construction Air Quality Management Plan (AQMP) to Metrolinx. Implement the AQMP after receipt of approval from Metrolinx. The AQMP will: – Identify specific AQ objectives relevant to the Project identified in AQ Technical Report (Appendix A3) and as outlined in the Metrolinx Environmental Guide for Air Quality and Greenhouse Gas Emissions Assessment (2019). – Define the Project's AQ impact zone and identify all sensitive/critical receptors within this area. – Include requirements for assessing baseline AQ by continuous measurement of local ambient concentrations of PM2.5 and PM10 over a minimum period of one week, for locations where large local sources of pollution (such as highways), directly affect AQ in the zone of influence of the Project. – Estimate and document the predictable worst-case AQ impacts of the Project on sensitive/critical receptors within the AQ impact zone, develop appropriate mitigation measures for each relevant construction activity, describe how to record and demonstrate their effectiveness, and commit to their timely implementation. – Include requirements for continuously monitoring $PM_{2.5}$ and PM_{10} and for monitoring any other contaminant that is predicted to exceed its relevant AQ objective during any phase of the Project and at any receptor (utilizing continuous monitoring where available or non-continuous monitoring otherwise). – Establish specific protocols for action items when relevant AQ objectives are exceeded, including an investigation procedure when exceedances are identified, determining mitigation measures and timeframes for their implementation. – Specify reporting requirements and timeframes, including reporting any exceedance of a continuously monitored ambient AQ objective at any location to Metrolinx within a one hour (or a timeframe established in AQMP) of the occurrence; reporting an exceedance of a non-continuously monitored contaminant within 24-hrs of receipt of the data. – Establish specific protocols for documenting, reporting and addressing public complaints. – Establish a communication protocol with nearby sensitive/critical receptors to provide alerts when monitoring indicates that air contaminant concentrations may be elevated for a prolonged period of time (e.g., over 8 hrs), and also provide guidance on methods to limit exposure (e.g., remaining indoors with windows closed during periods of adverse AQ, confirm Heating, Ventilation, and Air-Conditioning System (HVAC) systems are maintained following manufacturer's recommendations, etc.). – Include an explicit commitment to the implementation of the applicable best practices identified in the Environment Canada document, Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities (2005).	• Develop and submit to Metrolinx for approval a template for Weekly Air Quality Monitoring Reports (WAQMR). Implement the WAQMR after receipt of approval from Metrolinx and start of construction. The WAQMR will document how AQ monitoring has been conducted and compliance assessed to effectively prevent unacceptable rates of air emissions in accordance with the following considerations: – The construction related air contaminants of primary concern are in the form of particulate matter, with the principal construction related fractions of $PM_{2.5}$ and PM_{10} - particulate matter of less than 2.5 and 10 micron in diameter, respectively. Other contaminants of concern include crystalline silica and oxides of nitrogen. The list of contaminants will be expanded with any and all air pollutants that may be produced as a result of the work. – Criteria for $PM_{2.5}$, PM_{10} and crystalline silica are provided in Metrolinx's Environmental Guide for Air Quality and Greenhouse Gas Emissions Assessment (2019). The other applicable objectives for air contaminants of interest include the Ambient Air Quality Criteria (AAQC) and Canadian Ambient Air Quality Standards (CAAQS). • The WAQMR shall include: - Planned construction activities - Daily documentation of weather forecasts, and any AQ Health Index / Special AQ Statements/ Smog and Air Health Advisory issued by Environment and Climate Change Canada (ECCC) or MECP - Measured wind conditions by an on-site meteorological station

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Air Quality cont.	Air Quality	• Construction-related air pollution (such as dust emissions, tailpipe emissions, and emissions from exposing contaminated materials) may pose risks to human health and wellbeing	Potential effects anticipated	No potential effects anticipated	All Project Components	• Prior to construction, identify all adjacent critical receptors (e.g., hospitals, senior's residences, day care facilities, schools, residences) that may be impacted by construction-related air emissions. • Prior to construction, re-assess the assumptions of the AQ Technical Report (Appendix A3), and select methods, operations, materials and equipment to meet applicable AQ Objectives and mitigation thresholds. Plan the layout of construction sites, including access roads, site entrances/exits, staging and laydown areas to limit AQ impacts at adjacent sensitive/critical receptors. • In addition to the mitigation measures outlined above, implement the more detailed mitigation measures recommended in the AQ Technical Report (Appendix A3).	• Documentation of observations of on-site activities and conditions, monitoring activities, any exceedances of applicable AQ objectives and mitigation thresholds, remedial actions / mitigation measures as well as observations after implementation of mitigation measures. • Siting of the air quality monitors should generally follow the guidelines provided in the MECP Operations Manual for Air Quality Monitoring in Ontario (2018) as much as practicable. For pre-construction, only one location needs to be monitored to establish baseline AQ levels. During construction, ideally a minimum of two monitoring locations should be used, one located upwind to assess background concentrations and one located downwind of the active construction zone. • In addition to the monitoring outlined above, implement the more detailed monitoring activities recommended in the AQ Technical Report (Appendix A3).
	Air Quality	• Air quality impacts from operations may pose risks to human health and wellbeing. Potential air quality impacts could include effects from fuel combustion equipment at GO stations, train operations and maintenance activities	No potential effects anticipated	Potential effects anticipated	Linear Facilities GO Station Locations	• Air approvals should be obtained for the GO station operations and air emission sources as applicable. Significant emissions from the GO station should be assessed and modelled following MECP guidance and must comply with applicable Ontario Regulation 419/05 standards. • A detailed Operations Air Quality Management Plan should be developed to document the controls and methods that Metrolinx will implement during project operations to limit the generation and dispersion of airborne particulate matter and air contaminants associated with the Project operations. • Where practicable, the following mitigation measures should be implemented to reduce air contaminant emissions from train and GO station operations: - Selecting a less polluting form of energy or fuel (i.e., electricity or hydrogen rather than diesel fuel) for equipment used at the GO station. - Selecting equipment (such as backup generators and locomotives) with engines and propulsion systems that meet higher emission standards, meaning lower emissions (i.e., Tier 4 rather than a lower tier). - When selecting new train fleet, consider designs that reduce/limit non-exhaust particulate emissions, such as automatic train control/braking systems, wheel and track materials and design, optimizing the wheel profile and applying friction modifiers on wheels or rails to decrease wear particles, choice of brake pad materials. - Maintaining engines and emission control equipment to manufacturers' specifications.	• On-site inspections should be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. • The expected impacts from operations should be effectively mitigated provided that mitigation measures established in the Air Quality Management Plan are followed. Ambient air quality monitoring is not expected to be required. • Weekly Air Quality Monitoring Reports will be prepared to manage air emissions.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Air Quality cont.	Air Quality cont.	• Air quality impacts from operations may pose risks to human health and wellbeing. Potential air quality impacts could include effects from fuel combustion equipment at GO stations, train operations and maintenance activities	No potential effects anticipated	Potential effects anticipated	Linear Facilities GO Station Locations	- Preventive maintenance programs to check that materials and equipment remain in a state of good repair. • Procedures to respond to employee or passenger concerns should be developed and implemented. • Explore planting of trees and vegetation in areas where highest dust impacts are expected.	
Noise and Vibration	Construction Noise	• Environmental noise may cause disturbance and/or annoyance. • The severity of the noise effects resulting from construction projects varies, depending on: - Scale, location and complexity of the project - Construction methods, processes and equipment deployed - Total duration of construction near sensitive noise receptors - Construction activity periods (days, hours, time period) – Number and proximity of noise-sensitive sites to construction area(s)	Potential effects anticipated	No potential effects anticipated	All Project Components	• Nearby sensitive receptors will be notified of construction activities anticipated to create noise disturbance prior to commencement of the activities. • Noise emissions of the construction equipment should be reviewed during detailed design to confirm that they are within the NPC-115 and NPC-118 limits. If they are expected to exceed the limits, quieter equipment should be considered for the Project. Alternatively, noise control options, such as silencers/mufflers should be investigated and implemented for specific equipment. • If the minimum setback distances outlined in the Noise and Vibration Technical Report (Appendix A4) cannot be maintained during the Project construction, temporary noise barriers for construction hoarding should be considered where feasible as primary means of construction noise mitigation for the Project. • Noise shrouds for piling should be considered for the bridge construction where the receptors are within the ZOI established (refer to Table 6.2 of the Noise and Vibration Technical Report (Appendix A4) for a list of ZOIs). Noise shrouds should have a minimum noise reduction of 10 dB. Vibratory/sonic or auger piling may be considered as alternate piling option. • Where noise barriers are used, the barriers should break line-of-sight between the construction equipment and the receptors, should have a minimum surface density (mass per unit of face area) of 20 kg/m^2 (4 lb/ft^2) or an acoustic performance of STC 32 (per CSA-Z107.9-00), and be free of gaps and cracks. It is preferable that barriers are absorptive on the construction side. • Prior to commencement of construction, develop and submit a detailed Construction Noise and Vibration Management Plan based on the actual equipment sound levels and their locations. • The Construction Noise and Vibration Management Plan shall: • Document and commit to all measures to be taken for meeting the noise exposure limits documented in the Metrolinx Environmental Guide of Noise and Vibration Impact Study (2019b) at every directly exposed sensitive receptor and throughout the entire project.	• The Construction Noise and Vibration Management Plan shall incorporate the following requirements related to monitoring of noise and noise related complaints: – Monitor noise where the Construction Noise and Vibration Management Plan indicates that noise exposure limits may be exceeded. At these locations, monitor noise continuously at each geographically distinct, active construction site with one monitor located strategically to capture the highest exposure level based on planned construction activities and the number, geographic distribution and proximity of noise sensitive receptors. – Develop weekly reports describing the monitoring conducted and summarizing the data collected for the reporting period. The reports will include but not be limited to the number and duration of any incident during which any of the noise exposure limits documented in the Metrolinx *Guide for Noise and Vibration Assessment* (2019c) were exceeded, the probable cause of each exceedance, the incident-specific measure(s) implemented, the resulting mitigated noise levels and the complaints investigation procedure.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Noise and Vibration cont.	Construction Noise cont.	• Environmental noise may cause disturbance and/or annoyance. • The severity of the noise effects resulting from construction projects varies, depending on: - Scale, location and complexity of the project - Construction methods, processes and equipment deployed - Total duration of construction near sensitive noise receptors - Construction activity periods (days, hours, time period) • Number and proximity of noise-sensitive sites to construction area(s)	Potential effects anticipated	No potential effects anticipated	All Project Components	• Determine the ZOI for construction related noise based on the noise exposure limits outlined in the Metrolinx Guide for Noise and Vibration Assessment (2019b) and taking into consideration the construction site, staging and laydown sites and hauling routes, each stage of the construction (including demolition), the overall construction schedule along with the schedule of each major component and associated major construction processes and equipment usage. • Identify all sensitive receptors that fall within the ZOI for construction related noise. Mitigation measures will be proposed for these sensitive receptors, and the effects of the proposed mitigation measures will then be evaluated using noise modelling. If results of the modelling indicate that any sensitive receptors still remain within the Zone of Influence for construction related noise, then the following shall apply: • Additional mitigation such as noise wall in place of construction hoarding and construction operational changes are recommended and subsequently modelled until the sensitive receptor does not fall within the ZOI; or • If mitigation strategies are not viable, receptor-based mitigation will be proposed.	- Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.
	Construction Vibration	• Exposure to vibration may result in public annoyance and complaints. Vibration may also cause damage to buildings and other structures	Potential effects anticipated	No potential effects anticipated	All Project Components	• The potential vibration effects from construction equipment can be controlled by increasing the setback distance. Therefore, construction operational changes (e.g., maintaining setback distance and switching to lesser impactful equipment, etc.) are recommended. The owners of the properties within the ZOIs should be notified at least a week (preferably earlier) in advance before of commencing any nearby construction activities commencing. • Develop and implement a detailed Construction Noise and Vibration Management Plan for Metrolinx review and approval with minimum requirements outlined below: - Complete a detailed construction related vibration assessment prior to the commencement of construction that includes assessment of the vibration ZOI. - Complete pre-construction condition surveys for properties within the vibration ZOI of the planned work prior to beginning of any work.	• The Construction Noise and Vibration Management Plan shall incorporate the following requirements related to monitoring of vibration and vibration related complaints: - Monitor vibration continuously at structures where the Construction Noise and Vibration Management Plan indicates that structures are deemed to be within the ZOI for construction related vibration or at additional structures as requested by Metrolinx.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Noise and Vibration cont.	Construction Vibration	• Exposure to vibration may result in public annoyance and complaints. Vibration may also cause damage to buildings and other structures	Potential effects anticipated	No potential effects anticipated	All Project Components	• Identify any heritage structures and other sensitive structures, buildings or infrastructure vulnerable to vibration damage, assess requirements and, if necessary, develop mitigation measures. • Select construction/maintenance methods and equipment with the least vibration impacts. • In the presence of persistent complaints and subject to the results of a field investigation, identify alternative vibration control measures, where reasonably available. • The owners of properties within the Zone of Influence will be notified in advance of construction activities. • Construction planning such as maintaining setback distance and switching to less impactful equipment are recommended.	- The type of Vibration Monitoring Program that is established is based on the vibration ZOI, the project location, duration, presence of nighttime activity, and receptor proximity. The monitoring types include: o Type 1: Monitoring continuously throughout the project (for receptors within the ZOI). o Type 2: Monitoring during most impactful phases of the project only (for receptors outside of the ZOI Influence but within 50 m of the boundary of the construction site). o Type 3: Monitoring in response to complaints only (for receptors outside of the ZOI and beyond 50 m of the boundary of the construction site). • Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.
	Operational Noise (Trains)	• Environmental noise may cause annoyance, disturb sleep, and disturb other activities. • Project noise from operations may be a concern for the receptors within the Noise and Vibration Assessment Area	No potential effects anticipated	Potential effects anticipated	Linear Facilities GO Station Locations	• Trains are expected to stop and/or move at a reduced speed near the GO Station associated with the Fox Street (B1 Thornton's Corners East) GO Station. Curved portion of the track at this location should be designed and maintained with track lubrication to reduce or eliminate squeal noise from curved rail. • Six noise barriers are recommended along various portions of the rail corridor and in proximity to GO Stations B1, B2, B3, and B4 and where feasible. • Locomotives should be positioned at the east end of trains station at the Bowmanville Avenue (B4 Bowmanville) GO Station layover facility. • The north surface of Noise Barrier B (located on the south side of the rail corridor from approximately from Wilson Road South to Farewell Street) to be of an acoustically absorptive finish. • Mitigation to reduce operational noise generated by layover activities at POR093 is not feasible given the proposed development is a 25-storey high-rise building overlooking the proposed layover yard. No other feasible at-source mitigation measures were identified. There may be at-receptor mitigation measures that could be considered during the detailed design phase of the Project and during the land use planning and approval process for this development.	• Establish a Complaints Protocol to respond to issues related to POR083 and POR084.
	Vibration	• Vibration can cause disturbance and/or annoyance	No potential effects anticipated	Potential effects anticipated	Linear Facilities	• Ballast mats or other feasible mitigation measures are recommended to mitigate the impact of operational vibration at the dwellings represented by PORs 009, 014, 031, 402, 043 and 047 (refer to Appendix A4 for POR locations).	• Vibration monitoring is not required for Project operations.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Socio-Economic and Land Use Characteristics	Property	• Property acquisition – permanent and temporary	Potential effects anticipated	No potential effects anticipated	Linear Facilities	• Specific property requirements will be confirmed during design. Where access to property is required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures. • Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that limit adverse effects to sensitive receptors.	• None anticipated at this time.
	All land uses and adjacent lands	• Nuisance effects from construction activities	Potential effects anticipated	No potential effects anticipated	All Project Components	• Mitigation measures related to potential nuisance effects related to air and noise are outlined in the AQ and Noise and Vibration Assessments, which are provided under separate cover. • An Erosion and Sediment Control Plan will be developed in accordance with the Toronto and Region Conservation Area's Erosion and Sediment Control Guideline for Urban Construction (2019), as amended from time to time, that addresses sediment release to adjacent properties and roadways. • Develop a Communications Protocol in accordance with the Project Agreement, which will indicate how and when surrounding property owners and tenants will be informed of anticipated upcoming construction works, including work at night, if any. • Develop a Complaints Protocol in accordance with the Project Agreement.	• When applicable, monitoring related to potential nuisance effects are outlined in the AQ and Noise and Vibration above. • Erosion and sediment control monitoring to be conducted as per the Project Agreement. • Number and resolution of complaints received.
	All land uses and adjacent lands	• Land use and access disruption	Potential effects anticipated	No potential effects anticipated	All Project Components	• Provide well connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours where required. • Provide temporary lighting and wayfinding signs and cues for navigation around the construction site. • Develop a plan to reduce the effects of light pollution in accordance with the Project Agreement. • Access to nearby land uses will be maintained to the extent feasible for vehicular, pedestrian and cyclist traffic. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur. • Temporary vehicular and pedestrian facilities will comply with accessibility standards.	• Temporary access paths, walkways, cycling routes and fencing should be monitored. • Number and resolution of complaints received.
	All land uses and adjacent lands	• Change in land use	Potential effects anticipated	No potential effects anticipated	GO Station Locations	• A range of municipal permits and approvals may be required for the Project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.	• None anticipated at this time.
	All land uses and adjacent lands	• Access effects related to risk of entrapment or concealment in bridge or tunnel structures	No potential effects anticipated	Potential effects anticipated	Bridges	• Implement Crime Prevention Through Environmental Design principals to address these concerns during detailed design.	• None anticipated at this time.
	All land uses and adjacent lands	• Nuisance effects from operations	No potential effects anticipated	Potential effects anticipated	GO Station Locations	• Develop a Complaints Protocol in accordance with the Project Agreement.	• Number and resolution of complaints received.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Socio-Economic and Land Use Characteristics cont.	Built Form / Visual Characteristics	• Visual effects from construction areas/activities	Potential effects anticipated	No potential effects anticipated	All Project Components	• A screened enclosure for the development site may be provided, with particular attention to the waste disposal and material storage areas. • Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary. • Construction schedule delays will be avoided to the extent possible in order to limit the duration of construction and corresponding visual effects. • Retain existing vegetation to the extent practicable.	• Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified areas.
	Light Pollution	• Light trespass, glare and light pollution effects	Potential effects anticipated	No potential effects anticipated	Bridges GO Station Locations	• Comply with all local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting in areas near or adjacent to highways and roadways regarding outdoor lighting for both permanent and temporary construction activities and incorporate industry best practices provided in ANSI/IES RP-8-18 Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting, as described in the Project Agreement. • The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.	• Number and resolution of complaints received.
	Built Form / Visual Characteristics	• Visual effects from new infrastructure	No potential effects anticipated	Potential effects anticipated	All Project Components	• Metrolinx will consider maintenance of vegetation to the extent possible and replanting of vegetation to maintain natural buffers where appropriate and feasible. • Artificial lighting will be incorporated as per applicable lighting standards.	• No monitoring required.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Socio-Economic and Land Use Characteristics cont.	Utilities	• Interference with local utilities	Potential effects anticipated	No potential effects anticipated	Linear Facilities	• Develop and implement a detailed Utility Infrastructure Location Plan that identifies all utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. The Utility Infrastructure Location Plan will be developed in accordance with the Project Agreement. • Additional surveys shall be performed prior to construction to field locate and verify the existing utilities within the project area and document their condition. • Perform all work identified in the Utility Infrastructure Location Plan to protect, support, safeguard, remove, and relocate all Utility Infrastructure. • Obtain permits and consents from and with all Utility Companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and or commissioning of Utility Infrastructure. • Limit impact to the Train Service Plans and to continuity of service and disruption to property owners and customers of the Utility Companies to the satisfaction of the Utility Companies and Metrolinx. • Where new utility crossings are proposed, application for a new utility crossing agreement will be required. Where modifications to an existing utility crossing takes place, updates to an existing utility crossing will be needed.Post- construction inspections of the new utility infrastructure shall be undertaken for applicable works upon completion of the construction works to document condition. • Obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards Canadian Standards Association (CSA) S250-11 – Mapping of Underground Utility Infrastructure (2020), as amended from time to time.	• Maintain regular communication and coordination through issuance of regular progress reports and updates to applicable utility agencies. • Record all installation tolerances and how they are to be monitored. • Perform inspection and testing to check successful utility relocation and safe and efficient installation. • In the event of potential effects to critical utilities, instrumentation and monitoring shall be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities. Develop and implement tracking system for as-built deliverables.
	Utilities	• Relocation or realignment of utilities and retaining walls may impact additional trees and vegetation	Potential effects anticipated	No potential effects anticipated	Linear Facilities	• Any relocation or construction of utilities and retaining walls on City of Oshawa or Municipality of Clarington property may require consultation in order to proceed with tree injury or removal.	• No monitoring required.
	Source Water Protection	• Accidental spills or releases	Potential effects anticipated	Potential effects anticipated	All Project Components	• A Spill Prevention and Response Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the response plan. • The Spill Prevention and Response Plan will identify work areas that fall within vulnerable areas for source water protection (i.e., HVAs and EBAs) • Refuelling of equipment will occur at least 30 m away from any watercourse. • Refuelling will be done within refuelling stations lined with appropriate material to prevent seepage and fuel discharge. • All machinery, construction equipment and vehicles arriving on site should be in clean condition (e.g., free from fluid leaks, soils containing seeds of plant material from invasive species) and be inspected and washed in accordance with the Clean Equipment Protocol for Industry (Halloran et al. 2013) prior to arriving and leaving the construction site in order to prevent the spread of invasive species to other locations.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Socio-Economic and Land Use Characteristics cont.	Source Water Protection	• Contamination from road salt application, handling and storage or road salt and snow storage	No potential effects anticipated	Potential effects anticipated	GO Station Locations	• Winter maintenance activities shall be undertaken by persons who are certified by Smart About Salt, and best management practices for salt and snow shall be implemented.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required.
Traffic and Transportation	Road Network	• Construction may result in the need for temporary road or lane closures	Potential effects anticipated	No potential effects anticipated	Bridges	• Traffic Control and Management Plan(s) will be developed prior to construction to maintain reasonable access through work zones, to the extent possible. • Access to nearby land uses will be maintained for vehicular, pedestrian and cyclist traffic, to the extent feasible. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur. • Temporary vehicular facilities will comply with accessibility and applicable municipal standards. • Construction schedules will be shared with the public in advance of any construction works to reduce traffic during peak hours.	• Pedestrian, cyclist, and vehicular traffic impacts are to be monitored in accordance with a Traffic and Transit Management Plan and adjusted as necessary during the construction period.
	Road Network	• Safety concerns based on additional hazards (i.e., visual distractions, lane restrictions, etc.)	Potential effects anticipated	No potential effects anticipated	Bridges	• Traffic Control and Management Plan(s) will be developed prior to construction to maintain reasonable access through work zones, to the extent possible. • Temporary vehicular facilities will comply with accessibility and applicable municipal standards. • Construction schedules will be shared with the public in advance of any construction works to reduce traffic during peak hours.	• Pedestrian, cyclist, and vehicular traffic impacts are to be monitored in accordance with a Traffic and Transit Management Plan and adjusted as necessary during the construction period.
	Road Network / Transit Network	• Select intersections operate at or close to theoretical capacity • Operations may result delays to bus routes	No potential effects anticipated	Potential effects anticipated	GO Station Locations	• Multi-modal planning and analysis for each proposed station site will be provided at later stages of the Project where further details of the proposed GO stations and their adjacent TOC plans become available in accordance with the municipal planning process and subject to delivery through Metrolinx's TOC Program.	• No monitoring required.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Traffic and Transportation cont.	Transit Network	• Construction will result temporary changes to local bus routes	Potential effects anticipated	No potential effects anticipated	Bridges	• Notify the public in advance of any potential service disruptions. • Consult with local transit agencies to establish a suitable mitigation strategy to be implemented.	• Traffic impacts to be monitored in accordance with the Construction Traffic Control and Management Plan and adjusted as necessary during the construction period.
	Cycling, Pedestrian and Trail Network	• Temporary effects on cyclists/pedestrians such as temporary partial or full sidewalk closures, including increased distance to travel and greater exposure to weather elements	Potential effects anticipated	No potential effects anticipated	Bridges	• Potential effects to pedestrian and cyclist activities during construction will be mitigated through the installation of appropriate wayfinding, regulatory, and warning signs. • Existing sidewalks and crossings will be maintained to the extent possible. • Temporary pedestrian facilities will comply with accessibility and applicable municipal standards.	• Impacts to pedestrians and cyclists are to be monitored in accordance with the Construction Traffic Control and Management Plan and adjusted as necessary during the construction period.
Cultural Environment	Built Heritage Resources	Indirect impacts resulting from vibration damage during construction activities to 17 properties including: • CPR Bridge over CN Tracks, Oshawa (BHR-1) • 33 Avenue Street, Oshawa (BHR-8) • 15 Hall Street, Oshawa (BHR-11) • 394 Simcoe Street South, Oshawa (BHR-16) • 399 Simcoe Street South, Oshawa (BHR-22) • 45 Albany Street, Oshawa (BHR-45) • 435 Albert Street, Oshawa (BHR-71) • 433 Albert Street, Oshawa (BHR-72) • 431 Albert Street, Oshawa (BHR-73) • 371 Albert Street, Oshawa (BHR-74) • 367 Albert Street, Oshawa (BHR-75) • 500 Howard Street, Oshawa (BHR-115)	Potential effects anticipated	No potential effects anticipated	Linear Facilities	• Preferred Option: Avoid the BHR by establishing a buffer zone around the resource. This should use appropriate preventative measures such as mapping of the BHR on construction maps and temporary fencing. Staging and laydown areas should also be selected so that they are non-invasive and avoid the BHR. Where avoidance is not feasible, the alternative option should be applied. • Alternative Option: Where construction activities are anticipated within the buffer zone a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required. • Vibration velocity, or Peak particle velocity (PPV), should be limited to 3 mm/s. • Construction operational changes (e.g., maintaining setback distance and switching to lesser impactful equipment, etc.) are recommended.	• Construction vibration monitoring is recommended for the structures that are expected to exceed the criteria.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Built Heritage Resources cont.	• 356 Ritson Road South, Oshawa (BHR-147) • 464 Ritson Road South, Oshawa (BHR-148) • 470 Ritson Road South, Oshawa (BHR-149) • 349 Ritson Road South, Oshawa (BHR-151) • 393 Wilson Road, Oshawa (BHR-154)					
	Built Heritage Resources	Direct impacts to 500 Howard Street (BHR-115), Oshawa, a Provincial Heritage Property of Provincial Significance, due to the conversion and development of the property into the Front Street (B2 Ritson) GO Station and associated TOC include: • adaptive re-use of the building on site for the Front Street (B2 Ritson) GO Station (and/or associated TOC) that will conserve the heritage attributes of the Provincial Heritage Property of Provincial Significance • demolition of the portion of the building that does not include the heritage attributes of the Provincial Heritage Property of Provincial Significance and construction of the Front Street (B2 Ritson) GO Station	Potential effects anticipated	No potential effects anticipated	GO Station Locations	• In accordance with the *Ontario Heritage Act* and associated Standards & Guidelines for Conservation of Provincial Heritage Properties (MTCS 2010) for this Provincial Heritage Property of Provincial Significance: • Priority will be given to avoiding impacts to the identified heritage attributes. This will be guided by the Strategic Conservation Plan (SCP) that Metrolinx has prepared for the property, as well as Heritage Impact Assessments (HIAs). The following reports will be completed following the TPAP: - Phase I - HIA for the stabilization, protection and mothballing of Part 1 (all heritage attributes are encompassed in Part 1); the identification of all programming needs; the potential full or partial demolition of Part 2; and the potential (partial or complete) transfer of Part 2 out of provincial control. o The HIA for the demolition of Part 2 of the building on the property was completed on April 13, 2023. The demolition of Part 2 received MCM Minister's Consent on May 26, 2023. o If construction of the Front Street (B2 Ritson) GO Station is to occur during this phase (Phase I), an additional HIA will be prepared, to describe all impacts and mitigations. - Phase II – HIA will be completed for the rehabilitation, interpretation and adaptive reuse of Part 1 of the property. If the construction of the new Front Street (B2 Ritson) GO Station was not assessed previously in Phase I, it will be included in this HIA. It will also include the development of the TOC and adaptive reuse of Part 1. To protect the heritage value of Part 1, legally binding protections are required and will be secured through applicable agreements via the TOC program, or as part of a future disposition. A future disposition would be subject to an additional Minister's Consent prior to any demolition, removal, or transfer of any part of the property out of provincial control. • Where construction activities are anticipated within the buffer zone a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.	• Not applicable.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Built Heritage Resources	• Direct impact to 500 Howard Street (BHR-115) resulting from tree removal, fence removal and grading would be required along the north edge of the property to provide grading of the 2nd GO Track.	Potential effects anticipated	No potential effects anticipated	GO Station Locations	• Avoid the BHR and any of its heritage attributes but encroachment onto the subject property anticipated. The trees and chain link fence along the north boundary of the subject property would be removed to accommodate grading but would have no impact on any of the identified heritage attributes of the subject property.	• Not applicable.
	Built Heritage Resources	• Potential relocation of Front Street Multi-Use Crossing (Michael Starr Trail) as a bridge or tunnel crossing to the east of the existing crossing location in order to provide an opportunity to connect the Trail to proposed platform(s) of the proposed future Ritson GO Station while maintaining existing multi-use crossing access. Proposed relocated multi-use crossing may encroach onto the north side of 500 Howard Street (BHR-115).	Potential effects anticipated	No potential effects anticipated	GO Station Locations	• Preferred Option: The proposed relocation of Front Street Multi-Use Crossing (Michael Starr Trail) as a bridge or tunnel crossing may be located west of 500 Howard Street and partially within municipal right-of-way with no encroachment on the subject property. Alternative Option: Should the Front Street Multi-Use Crossing (Michael Starr Trail) be relocated to the east of the existing crossing location, there would be anticipated encroachment onto the north boundary of 500 Howard Street during construction and in operation. Heritage attributes located on Part 1 of the property would be not impacted. A Cultural Heritage Risk Management Plan will be developed before work commences to facilitate undertaking proposed work in a manner which mitigates the possibility of impacts to the BHR.	• Not applicable.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Built Heritage Resources	• Direct impact to Albert Street Bridge and Farewell Street Multi-Use Bridge • The MHC made an interim decision that the Albert Street Bridge and Farewell Street Multi-Use Bridge are Provincial Heritage Properties.	Potential effects anticipated	No potential effects anticipated	Bridges	• Removal and/or replacement of the bridges will be completed in accordance with applicable approvals. • CHERs have been completed for both bridges and it has been determined that they both meet criteria contained in O. Reg 9/06 (PHP). • HIAs are being undertaken for both bridges.	• Not applicable.
	Built Heritage Resources	The following 16 properties were found to be within the project footprint and at risk of direct impact due to potential property acquisition or easements: • 83 Avenue Street (BHR-6) • 394 Simcoe Street South (BHR-16) • 399 Simcoe Street South (BHR-22) • 356 Ritson Road South (BHR-147) • 464 Ritson Road South (BHR-148) • 470 Ritson Road South (BHR-149) • 359 Ritson Road South (BHR-150) • 349 Ritson Road South (BHR-151) • 374 Farewell Street (BHR-155)	Potential effects anticipated	No potential effects anticipated	Linear Facilities Bridges	• Priority will be given to avoiding impacts to the identified heritage attributes. • Where possible, design will be refined so that direct property impacts to BHRs are avoided. • CHERs have been completed for all directly impacted BHRs. It has been determined that the following BHRs meet the criteria contained in O. Reg. 9/06 (PHP), and none of the BHRs meet the criteria contained in O. Reg. 10/06 (PHPPS): - 356 Ritson Road South (BHR-147) - 464 Ritson Road South (BHR-148) - St. Wolodymyr and St. Olha Cemetery (BHR-157) - 1598 Baseline Road (BHR-161) - 2228 Baseline Road (BHR-167) - 1766 Baseline Road (BHR-171) • HIAs are being undertaken for 356 Ritson Road South, the St. Wolodymyr and St. Olha Cemetery and 2228 Baseline Road. • HIAs are not required at this time for 464 Ritson Road South, 1598 Baseline Road, and 1766 Baseline Road due to the distance between the proposed undertaking and identified heritage attributes.	• Not applicable.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Built Heritage Resources cont.	• St. Wolodymyr and St. Olha Cemetery (BHR-157) • 1558 Baseline Road (BHR-159) • 1580 Baseline Road (BHR-160) • 1598 Baseline Road (BHR-161) • 2228 Baseline Road (BHR-167) • 1490 Baseline Road (BHR-169) • 1766 Baseline Road (BHR-171)					
	Cultural Heritage Landscapes	Direct impacts to wetlands and watercourses as a result of construction activities, including from: • removal of vegetation communities • disturbance and displacement of wildlife • habitat loss/degradation, soil contamination as a result of possible spills • introduction of invasive species • increased erosion and sedimentation • reduction in ecological activity and integrity	Potential effects anticipated	No potential effects anticipated	All Project Components	• Compensation for tree removals will be undertaken in accordance with provisions outlined in Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Vegetation removal will be reduced to the extent possible and limited to the construction footprint. • Construction fencing and or silt fencing, where appropriate will be installed and maintained to clearly define construction footprint and prevent accidental damage or intrusion to adjacent vegetation or ecological land classification communities. • Provide compensation for removal of vegetation in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Provide compensation for disturbed or removed wetlands based on Metrolinx Guidelines and in consultation with CLOCA. • Temporarily disturbed areas will be re-vegetated using non-invasive, native plantings and/or seed mix, appropriate to the site conditions and adjacent vegetation communities. Seed mixed will be used in conjunction with an appropriate non-invasive cover crop as needed. • Vegetation removals will also consider and mitigate potential impacts to sensitive species and features. • On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required.	• On site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Archaeological Resources	Potential for the disturbance of unassessed or documented archaeological resources	Potential effects anticipated	No potential effects anticipated	All Project Components	• Additional Stage 2 AA work will be undertaken for areas requiring further archaeological assessment as identified in the Stage 1 AA; if required, Stage 3 and 4, where recommended by previous stages will be undertaken by a licensed archaeologist as soon as possible and submitted to MCM for review and entering into the Ontario Public Register of Archaeological Reports. • The Constructor will develop and implement an Archaeological Risk Management Plan that addresses any recommendations resulting from Archaeological Assessments and documents all protocols for the discovery of human remains and undocumented archaeological resources. The Archaeological Risk Management Plan shall be amended to incorporate any additional actions required resulting from subsequent AA Reports and/or subsequent changes to Applicable Law. • All work shall be performed in accordance with Applicable Law, including but not limited to the *Ontario Heritage Act*, 1990 (OHA), the Ministry of Tourism, Culture and Sport (MTCS) *Standards and Guidelines for Consultant Archaeologists* (2011b), and the MTCS document, *Engaging Aboriginal Communities in Archaeology: A Draft Bulletin for Consultant Archaeologists in Ontario* (2011). • In the event that archaeological materials are encountered or suspected of being encountered during construction, all work will cease. The location of the findspot should be protected from impact by employing a buffer in accordance with requirements of the MCM. A professionally licensed archaeologist will be consulted to complete the assessment. If materials are confirmed to possess cultural heritage value/interest then they will be reported to the MCM, and further AA of the materials may be required. If it is determined that there is a potential for Indigenous artifacts, Metrolinx should be contacted, and Applicable Law will be followed. • If final limits of the Project Footprint are altered and fall outside of the assessed area, additional AAs will be conducted by a professionally licensed archaeologist prior to construction activities. This will include completing all required AAs resulting from the Stage 1 AA (Stage 2, Stage 3 and Stage 4, as required) as early as possible. • For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, additional AA will be conducted by a professionally licensed archaeologist prior to disturbance.	• Performance of the work will occur within land previously subject to an Archaeological Assessment. • Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities in the event that an archaeological resource is encountered. • Further archaeological assessment is not recommended for any portion of the Project's anticipated construction which impacts area previously assessed and not recommended for further archaeological work.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Archaeological Resources	Potential for the disturbance of unassessed or documented archaeological resources	Potential effects anticipated	No potential effects anticipated	All Project Components	• If human remains are encountered or suspected of being encountered during project work, all activities must cease immediately and the local police/coroner as well as the Bereavement Authority of Ontario on behalf of the Ministry of Government and Consumer Services must be contacted. Archaeological investigations of human remains will not proceed until police have confirmed the remains are not subject to forensic investigation. Once human remains have been cleared of police concern, the MCM will also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the OHA. If the human remains are determined to be of Indigenous origin, Metrolinx should be contacted, and all applicable law must be adhered to. • All AA findings will be shared with Indigenous communities, as per Metrolinx procedures.	
	Archaeological Resources	Potential to impact portions of the boundary of St. Wolodymyr and St. Olha Ukrainian Cemetery	Potential effects anticipated	No potential effects anticipated	**Linear Facilities**	• The St. Wolodymyr and St. Olha Ukrainian Cemetery property retains archaeological potential for archaeological resources not related to the cemetery, and Stage 2 archaeological assessment is recommended if design cannot be refined to avoid encroachment on this area. • A Cemetery Investigation Authorization issued by the Bereavement Authority of Ontario is required in advance of invasive archaeological fieldwork within the cemetery property. • Parts of the St. Wolodymyr and St. Olha Ukrainian Cemetery contain burials and cemetery investigation is recommended prior to construction impacts in these areas	• Further AA may identify the need for monitoring during construction.

Consultation Process

Consultation is required for an Addendum if, after submitting a Statement of Completion of the TPAP, the proponent wishes to make a change to the transit project that is inconsistent with the EPR, and if they deem that change to be Significant.

Consultation occurred with Project stakeholders (public [including property and business owners], agencies, municipalities, elected officials, and interest groups) and Indigenous communities during the course of the Addendum.

Stakeholders and Indigenous communities were initially identified through review of MECP's Government Review Team list, by reaching out to local and regional municipal bodies and agencies with jurisdiction in the Study Area, obtaining a list of Indigenous communities contacts from the MECP and MTO, and obtaining a list of property owners within 30 m of the Project Footprint. A Project contact list and mailing distribution map were prepared and are included in Appendix B.

Metrolinx consults with Indigenous communities with respect to the Constitution Act of Canada (Section 35) and as part of Environmental Assessment (EA) requirements. Metrolinx's Duty to Consult is triggered when Metrolinx is contemplating an action or decision that may have the potential to adversely impact aboriginal and/or Treaty rights, Often Metrolinx is engaging and consulting with Indigenous communities to fulfill both consultation requirements and EA requirements. Elements of fulfilling the Duty to Consult do not change based on EA requirements, and include but are not limited to: regular communication with Indigenous communities as the project progresses, meetings with leadership, members, and consultation offices within Indigenous communities, and identifying accommodation measures to avoid, mitigate and/or minimize adverse impacts on aboriginal and/or Treaty rights.

A direct email address (durhamregion@metrolinx.com) was created and monitored regularly by Metrolinx staff. Questions and comments submitted via email were responded to by Metrolinx.

The consultation process for the EPR Addendum included the following:

- The draft EPR Addendum was distributed to Indigenous communities and agencies for comment.
- A Notice of Public Information Centre was distributed to Project stakeholders and Indigenous communities, published to local media and posted on the Metrolinx Project website.
- The dedicated Project website and email address to facilitate public review of Project materials and submission of comments.
- Project pop-up events to provide the opportunity for the public to ask questions and provide feedback on the Project. The information was shared through the Metrolinx

Twitter handle @GOExpansion and the Regional Municipality of Durham online news platform.

- A Virtual Public Information Centre and Virtual Open House was held to provide information on the addendum process, existing conditions, potential effects of the proposed Project and to receive feedback and questions about the Project.
- Ongoing communication with stakeholders and Indigenous communities to provide Project information and respond to questions and comments.
- A Notice of EPR Addendum was distributed to stakeholders and Indigenous communities, published to local media and posted on the Project website to initiate the final 30-day review of this EPR Addendum. The EPR Addendum was made available electronically for public review.

Comments and questions arising from consultation activities were tracked and managed on an ongoing basis and incorporated into the development of the EPR Addendum as appropriate. All documents produced for consultation activities, including a comment tracking table and registry, were maintained as part of a Record of Consultation.

Climate Change Considerations

The MECP has prepared a guide titled Considering Climate Change in the Environmental Assessment Process (MECP 2017), to describe how EA processes can incorporate consideration of climate change effects. Considering climate change in accordance with the guide is meant to result in a project that is more resilient to future changes in climate and helps maintain the ecological integrity of the local environment in the face of a changing climate.

The climate change assessment contained in this EPR Addendum focuses on the various design and mitigation measures that will support climate change mitigation and adaptation during construction and operations of the Project.

Since the Project will be operational for the foreseeable future, it will likely be affected by future climate change-related events such as droughts or intense precipitation. As a result, designs, construction and operation stages of the Project should consider the potential for these future events. The Project will continue to take climate change considerations into account as the design progresses.

Future Commitments and Monitoring

O. Reg. 231/08 requires future commitments, including required permits and approvals to be documented as part of the TPAP. The intent of this requirement is to facilitate project implementation in accordance with project-specific mitigation measures and monitoring activities described in this EPR Addendum in a manner that does not result in negative impact on matters of provincial interest related to the natural environment or

to cultural heritage value or interest, or on constitutionally protected aboriginal or Treaty rights.

This EPR Addendum outlines the commitments made by Metrolinx as a part of the TPAP to continue to obtain permits and approvals required for the construction of improvements to, and as applicable, ongoing operations of the Project. Metrolinx has also committed to monitoring and adaptive management of mitigation measures throughout construction activities.

All applicable permits, approvals, and monitoring requirements under environmental laws will be reviewed, confirmed and obtained by Metrolinx prior to the construction of the Project. A complete table of future commitments is provided in Section 8.5 of this EPR Addendum.

This EPR Addendum identified the effects associated with the Project presented in this document, and the Project Footprint within which the Project can feasibly be constructed. The layout of Project components is subject to detailed-design and any variations from that shown in this EPR Addendum, unless it results in an environmental effect which cannot be accommodated within the committed mitigation measures, may not require additional consideration under O. Reg. 231/08.

Metrolinx is committed to continuous consultation with the public and regulatory agencies during the design of the Project. Metrolinx will continue to mitigate disruptions to affected local communities and maximize public support for the Project.

Abbreviations

%	percent
AA	Archaeological Assessment
AAQC	Ambient Air Quality Criteria
AMP	Amphibian Monitoring Station
AMTO	American Toad
ANSI	Area of Natural and Scientific Interest
AQ	Air Quality
AQMP	Air Quality Management Plan
AREMA	American Railway Engineering and Maintenance-of-Way Association
ARU	Wildlife Acoustics Song Meter SM4BAT detector
B(a)P	Benzo (a) pyrene
BHA	Butternut Health Assessment
BHR	Built Heritage Resource
BMP	Best Management Practice
BMS	Bat Monitoring Station
CAA	*Conservation Authorities Act*, 1990
CAAQS	Canadian Ambient Air Quality Standards
CC	Coefficient of conservatism
CHER	Cultural Heritage Evaluation Report
CHL	Cultural Heritage Landscape

CHR	Cultural Heritage Report
CHSR	Cultural Heritage Screening Report
CHVI	Cultural Heritage Value of Interest
CLOCA	Central Lake Ontario Conservation Authority
cm	centimetre
CN Rail	Canadian National Railway
CO2e	Carbon dioxide equivalent
COI	Contamination of Interest
CP Rail	Canadian Pacific Railway
CSA	Canadian Standards Association
CSP	Corrugated Steel Pipe
CTC	Credit Valley-Toronto and Region-Central Lake Ontario
dBA	A-weighted decibels
DBH	Diametre at Breast Height
DFO	Fisheries and Oceans Canada
DRM	Design Requirements Manual
DRT	Durham Region Transit
DRTPM	Durham Region Transportation Planning Model
EASR	Environmental Activity and Sector Registry
EBA	Event Based Area
ECA	Environmental Compliance Approval
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification

EMMP	Environmental Mitigation and Monitoring Plan
Env. MS	Environmental Management System
EPR	Environmental Project Report
ERIS	Environmental Risk Information Services
ESA	Environmental Site Assessment
ESA, 2007	*Endangered Species Act*, 2007
ESC	Erosion and Sediment Control
ft	foot
GGH	Greater Golden Horseshoe
GHG	Greenhouse Gas
GIS	Geographic Information System
GM	General Motors
GMDP	Groundwater Management and Dewatering Plan
GO	GO Transit
GRFR	Green Frog
GRT	Government Review Team
GRTR	Gray Treefrog
GTHA	Greater Toronto and Hamilton Area
ha	hectare
HDF	Headwater Drainage Feature
HIA	Heritage Impact Assessment
HONI	Hydro One Networks Inc.
hr	hour

HVAs	Highly Vulnerable Aquifer Areas
HVAC	Heating, Ventilation, and Air- Conditioning System
Hwy	Highway
IAA	*Impact Assessment Act*
IDF	Intensity-duration-frequency
IPCC	Intergovernmental Panel on Climate Change
IRO	Indigenous Relations Office
ISA	International Society of Arboriculture
IVM	Integrated Vegetation Management
KHF	Key Hydrological Feature
km	kilometre
km/ hr or km/ h	kilometre per hour
km^2	square kilometre
KNHF	Key Natural Heritage Feature
kt CO_2e	kilotonnes of carbon dioxide equivalent
L/day	Litre per day
LID	Low Impact Development
LIO	Land Information Ontario
LOS	Level of Service
m	metre
m/s	metre per second
m^2	metre squared
MBCA	*Migratory Birds Convention Act*, 1994

mbgs	metre below ground surface
MCM	Ministry of Citizenship and Multiculturalism
MECP	Ministry of the Environment, Conservation and Parks
MHC	Metrolinx Heritage Committee
min	minute
mm	millimetre
mm/s	millimetres per second
MMAH	Ministry of Municipal Affairs and Housing
MNR	Ontario Ministry of Natural Resources
MNRF	Ministry of Natural Resources and Forestry
MOECC	Ministry of the Environment and Climate Change
MOVES	Motor Vehicle Emission Simulator
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
MTCS	Ministry of Tourism, Culture and Sport
MTO	Ministry of Transportation
NAPS	National Air Pollution Surveillance Network
NETR	Natural Environment Technical Report
NHIC	Natural Heritage Information Centre
NHS	Natural Heritage System
NO	Nitric Oxide
NO2	Nitrogen Dioxide
O. Reg.	Ontario Regulation
OHA	*Ontario Heritage Act*, 1990

OHT	Ontario Heritage Trust
OP	Official Plan
OPSS	Ontario Provincial Standard Specification
ORM	Oak Ridges Moraine
OTG	On The GO
OUIT	University of Ontario Institute of Technology
PCA	Potentially Contaminating Activities
PIF	Project Information Form
PHP	provincial heritage property
PHPPS	provincial heritage property of provincial significance
PM10	Particulate matter 10 microns or less in diameter
PM2.5	Particulate matter 2.5 microns or less in diameter
POR	Point of Reception
PPS	Provincial Policy Statement
PPUDO	Passenger pick-up and drop-off
PPV	Peak Particle Velocity
PSW	Provincially Significant Wetland
PTTW	Permit to Take Water
PWQO	Provincial Water Quality Objectives
QP	Qualified Person
R.R.	Regional Road
RMS	Root Mean Square
RoC	Record of Consultation

ROW	Right-of-way
RTP	Regional Transportation Plan
S4	Species are considered secure, uncommon, but not rare
S5	Species are considered secure, common, widespread, and abundant
SAR	Species at Risk
SARA	*Species at Risk Act*, 2002
SARO	Species at Risk in Ontario
SCP	Strategic Conservation Plan
SCS	Site Condition Standards
SEMMP	Soil and Excavated Material Management Plan
SGA	Strategic Growth Area
SNA	No conservation status
SOCC	Species of Conservation Concern
SPPE	Spring Peeper
S-Rank	Subnational Rank
SWH	Significant Wildlife Habitat
SWM	Stormwater Management
TIA	Traffic Impact Analysis
TMC	Turning Movement Counts
TMP	Transportation Master Plan
TOC	Transit Oriented Community(ies)
TPAP	Transit Project Assessment Process
TPZ	Tree Protection Zone

TSS	Total Suspended Solids
U.S. EPA	U.S. Environmental Protection Agency
UGC	Urban Growth Centre
v/c	volume to capacity
VIA	Via Rail Canada Inc.
WAQMR	Weekly Air Quality Monitoring Report
WC	Watercourse Crossing Location
WPCP	Water Pollution Control Plant
WRAP	Western Regional Air Partnership
YOY	young of the year
ZOI	Zone of Influence

1.0 Introduction and Study Process

In February 2011, the Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility Environmental Project Report (EPR) was prepared by AECOM on behalf of GO Transit (GO) in accordance with the Transit Project Assessment Process (TPAP) under Ontario Regulation (O. Reg.) 231/08 - Transit Projects and Metrolinx Undertakings. Notice to Proceed was provided by the Minister of the Environment on March 28, 2011, and the Statement of Completion was issued on April 13, 2011. The EPR was completed to support required infrastructure improvements to address capacity requirements, manage traffic and support sustainable urban development along the GO rail system from 500 metres (m) west of Brock Street in the Town of Whitby to 500 m east of Regional Road 42/Darlington-Clarke Townline Road in the Municipality of Clarington.

The Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility Project consisted of installing additional track along the existing Canadian Pacific Railway (CP Rail) corridor to accommodate extended train service, a new connection from the GO Lakeshore East Rail Corridor to the CP Rail corridor through Corbett Creek and the construction of new GO stations, a new maintenance facility and a new layover facility. These project components were defined in the EPR to consider the potential environmental impacts of the project and recommend appropriate mitigation measures to be applied as design of the project advanced.

Since the completion of the EPR in 2011, Metrolinx has advanced the design of the project through additional feasibility work, use of the General Motors (GM) Spur in the updated alignment to remove the Corbett Creek crossing, changing GO station needs, removal of the Rundle Road train layover and in discussions with CP Rail regarding the use of its rail corridor for the new GO rail service. Metrolinx has undertaken this EPR Addendum to the 2011 EPR to address project refinements and revisions to the design approach since the completion of the EPR in 2011.

1.1 Purpose of the Document

This EPR Addendum documents the proposed changes to the project since the completion of the EPR in 2011, now referred to as the Oshawa to Bowmanville Rail Service Extension (the Project). It includes a review of the need, potential effects, proposed mitigation and significance associated with these Project changes, in accordance with Section 15 (1) of O. Reg. 231/08. The changes contemplated in this report include track alignment, track and supporting infrastructure, GO station locations, new and expanded bridges, and widening of at-grade crossings.

These proposed changes to the Project were determined to be inconsistent with the Project Description outlined in the Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility EPR (AECOM 2011a). As described in Section 15(1) of O. Reg. 231/08, any change that is inconsistent with a previously approved EPR requires a reassessment of the effects associated with the project, the identification of potential new mitigation measures, and potential new monitoring systems in an Addendum to the previously approved EPR. In addition, as per Section 16 of O. Reg. 231/08, should construction of a project not commence within 10 years of the Statement of Completion, a review of the project documentation is required. The Statement of Completion for the 2011 EPR is dated April 13, 2011, and more than 10 years has lapsed since the filing of this document.

Therefore, Metrolinx has prepared this EPR Addendum to address the effects associated with the proposed changes to the Oshawa to Bowmanville Rail Service Extension– EPR Addendum (Project) and to address the lapse of time since filing the Statement of Completion in 2011.

1.2 Project Overview

1.2.1 2011 EPR

The 2011 EPR examined expanding GO service on the Lakeshore East Corridor, between Oshawa and Bowmanville in Regional Municipality of Durham, which currently operates all-day rail service between Union Station in Downtown Toronto and the Durham College Oshawa GO (DC Oshawa GO) Station[4]. The Lakeshore East Corridor extension from Oshawa to Bowmanville was originally identified as one of 52 rapid transit improvements and expansion projects in the *MoveOntario* 2020 plan, Ontario's multi-year $17.5 billion rapid transit action plan for the Greater Golden Horseshoe (GGH).

The Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility EPR documents a nearly 25-kilometre (km) expansion of GO rail service from 500 m west of Brock Street in the Town of Whitby to 500 m east of Regional Road 42 / Darlington Clarke Townline Road in the Township of Clarington. The project was designed to expand GO service on the Lakeshore East Corridor, enabling it to meet the growth in commuter rail service throughout its service area along with the addition of a second major rail maintenance facility.

[4] In October 2022, Metrolinx announced that the Oshawa GO Station has been renamed Durham College Oshawa GO. Therefore, throughout the EPR Addendum and this Project, the Oshawa GO Station is referred to as Durham College Oshawa GO, or DC Oshawa GO.

A general description of GO's recommended Lakeshore East expanded commuter service, as defined in the 2011 EPR, included:

- **Peak Train Service Extension to Clarington** – The EPR identified the need for the addition of new tracks along the length of the CP Rail corridor to accommodate the proposed extended service for passenger trains, separate from existing CP Rail freight tracks. This alignment included an assumption that the configuration of the existing CP Rail tracks would be adjusted to accommodate the new tracks within the existing CP Rail right-of-way (ROW), limiting the extent of disturbance and reducing the width of crossing structures. This approach involved shifting the CP Rail tracks to the north in some sections to allow for the addition of two new GO tracks to the south. The EPR proposed creating a connection from the GO Lakeshore East Rail Corridor to the CP Rail corridor through Corbett Creek which is now proposed to be located at the GM Spur.

- **East Rail Maintenance Facility** – Construction is complete on this facility which increased GO's ability to handle rail equipment maintenance requirements for the future. The rail infrastructure to support the East Rail Maintenance Facility stretched from Victoria Road in the west to Thickson Road in the east. Development of this facility was completed in accordance with the 2011 EPR and will not be considered further in this Addendum Report.

- **Full Train Service to the Ritson Road GO Station (Oshawa)** – To achieve this service plan, GO planned to terminate its train service operation at the existing DC Oshawa GO and relocate it to the new full-service terminus station at Ritson Road on the north CP Rail corridor.

- **New GO Train Stations** – The EPR identified the locations of four new GO stations along the corridor, and consideration of establishing one additional potential future GO station when demand warrants the need for the additional station. Each GO station location was selected to provide adjacent communities with a convenient point of connection with the GO train system. GO station locations included:

  - GO Station B1 (Thornton's Corners East GO Station at Thornton Road)
  - GO Station B2 (Oshawa GO Station at Ritson Road)
  - GO Station B3 (Darlington GO Station at Courtice Road)
  - GO Station B4 (Bowmanville GO Station at Martin Road)
  - Future potential GO station at Bloor Street (not contemplated in the current design, and therefore not considered further in this Addendum Report)

- **New Train Layover Site** – The EPR recommended the train layover site be located adjacent to the CP Rail corridor along the south side between Rundle Road and Solina Road in the Township of Clarington. It would be developed to provide for eight trains for storage, as well as a Progressive Maintenance building capable of housing two 12-car trains. The layover site is not contemplated in the current design and will not be considered further in this Addendum Report.
- **Structural Improvements** – In order to accommodate additional tracks within the ROW, the EPR recommended several structural improvements including watercourse crossings, bridge enhancements, and other structural improvements in the form of concrete box/arch culverts. Extensions or replacements were proposed to accommodate the identified alignment centered on the existing corridor, including approximately 25-foot (ft) extensions for the additional tracks and new crossing structures for GO-CP connection, as needed.

1.2.2 2018 Project

In 2018 the Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility – EPR Addendum was initiated with some tasks partially completed. This included the development of baseline studies based on the Project design confirmed at the time, and early preparation and planning for an EPR Addendum.

Metrolinx also hosted public meetings to introduce the Project, provide an overview of existing study area conditions, and review next steps in the study process. The meetings were held on April 24 and 25, 2018 at the Garnet B. Rickard Recreation Complex in Bowmanville and the Oshawa Civic Recreation Complex in Oshawa, respectively.

In 2018, the Project was put on hold to review route alternatives and re-evaluate the business case for the Project. The Initial Business Case Update was completed by Metrolinx in February 2020 to confirm the preferred alignment reflected in this report, based on cost, benefits, operability, policy alignment and stakeholder considerations (Metrolinx 2020a).

1.2.3 Current Project

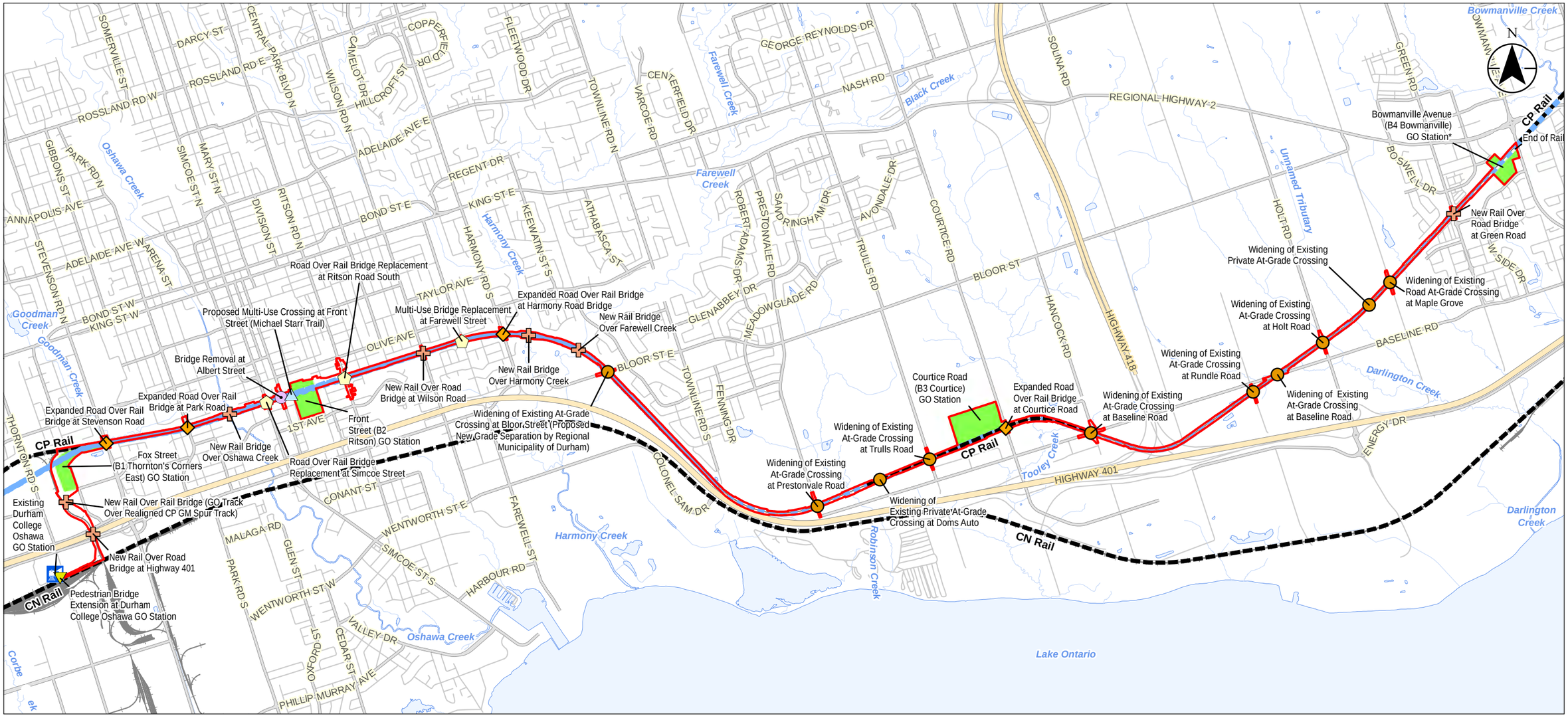
The Project includes the extension of GO rail service from the DC Oshawa GO through to Bowmanville, with four new proposed GO stations (Figure 1.1). Full details are provided in Section 2.0. In summary, the following Project components are proposed to be located on or adjacent to the rail corridor:

- Tracking, supporting track infrastructure, grading:
  - Proposed new track within the existing GO Lakeshore East Rail Corridor at the western limit of the Project, crossing Highway 401 via the existing GM Spur bridge. A new bridge will be constructed adjacent to the existing GM Spur bridge for the proposed realigned CP track. The new GO track will extend north to the existing CP Rail corridor, ending at Bowmanville Avenue.
  - Retaining walls and grading[5] to support track infrastructure
- Proposed GO station locations in proximity to:
  - Fox Street (B1 Thornton's Corners East)
  - Front Street (B2 Ritson)
  - Courtice Road (B3 Courtice)
  - Bowmanville Avenue (B4 Bowmanville)
- New bridges at the following locations:
  - Highway 401
  - GM Spur
  - Oshawa Creek
  - Wilson Road
  - Farewell Creek
  - Harmony Creek
  - Green Road
- New multi-use crossing (bridge or tunnel, to be determined):
  - Front Street (Michael Starr Trail)

[5] Grading includes sloping and contouring the earth to achieve the desired base to support rail infrastructure. Retaining walls may be proposed to limit grading impacts on adjacent properties.

- Bridge replacements at the following locations:
  - Simcoe Street
  - Ritson Road
  - Farewell Street[6]
- Bridge removal at Albert Street
- Bridge expansions at the following locations:
  - DC Oshawa GO (pedestrian bridge)
  - Stevenson Road
  - Park Road
  - Harmony Road
  - Courtice Road
- Widening of at-grade crossings to accommodate GO track(s) at the following locations:
  - Bloor Street
  - Prestonvale Road
  - Private crossing for Dom's Auto
  - Trulls Road
  - Baseline Road (two crossings)
  - Rundle Road
  - Holt Road
  - Private crossing west of Maple Grove Road
  - Maple Grove Road

[6] Multi-use bridge only. Multi-use bridges can be used by pedestrians and cyclists crossing the rail corridor.



Notes

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Legend

- Project Footprint
- Existing Durham College Oshawa GO Station
- Proposed Pedestrian Bridge Extension
- Proposed New Bridge
- Proposed Bridge Replacement
- Proposed Bridge Removal
- Proposed New Multi-Use Grade-Separated Crossing
- Proposed Upgrades to At-Grade Crossing
- Proposed Bridge Expansion
- Proposed GO Station Location
- Existing Railway
- Former Proposed GO Corridor (2011, 2018)
- Railway
- Highway
- Major Road
- Minor Road
- Watercourse
- Waterbody

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Stantec

Project Location
Regioan Municipality of Durham

165011019 REVA
Prepared by BCC on 2023-06-27
Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.1

Title
Project Overview

1.3 Changes to the Project

Based on continued Project planning and the advancement of preliminary design, refinements to the conceptual design identified in the 2011 EPR have been identified. The refinements – identified through consultation with CP Rail and other stakeholders - have resulted in changes to the track alignment, GO-CP connection, crossing requirements, and facility layouts. To accommodate these changes, more minor updates to ancillary systems such as signalization have also been identified.

A general description of the changes proposed for the Project include:

- **Tracks** – The original design of centering the track in the corridor has been revisited and is not feasible as a result of the need to protect the existing freight line and accommodate future freight service to the north. This alignment change has resulted in the need to accommodate one new track to the south of the existing rail line for the majority of the alignment, with two new tracks proposed between Ritson Road and Courtice Road. The alignment change also limits adjustments to the existing track. This will alter the Project Footprint along the alignment. Supporting infrastructure (grading, retaining walls, drainage, noise mitigation, etc.) has also been revised to accommodate for the alignment change.

- **Crossings** – The change in track alignment and operational conditions has resulted in new bridge structure modification needs, including considering footprints for new bridges, bridge expansions, or full replacement in some cases.

- **Additional Crossings** – The change in track alignment has resulted in new bridge structures required to be constructed. In addition, some new grade separations that were previously not identified will be required to meet operational standards.

- **Facilities** – The four proposed GO stations will be pursued through Metrolinx's Transit Oriented Community (TOC) Program. The TOC Program seeks to leverage the value of Metrolinx's transit network and service to have third parties fund the design and construction of new GO station infrastructure for Metrolinx to own and operate. The rigorous requirements that back all Metrolinx infrastructure projects will be met for service, design and construction.

  The locations for three of the four GO stations (i.e., Front Street [B2 Ritson]; Courtice Road [B3 Courtice]; Bowmanville Avenue [B4 Bowmanville]) will essentially remain the same, while the footprint of one GO station, Fox Street [B1 Thornton's Corners East), has shifted and requires additional studies and design changes. For the four GO stations, design changes are required to meet updated design and operational standards and may include new pedestrian tunnels, enhanced pedestrian connections, expanded parking areas and new access roads.

A fifth GO station site identified in the 2011 EPR located east of Bloor Street and south of Grandview Drive South is no longer being considered.

1.3.1 Addendum Study Area

The Project Footprint represents the area required to carry out all physical works and activities either directly for infrastructure or for associated Project uses (e.g., construction laydown areas). The Project Footprint is located on or adjacent to the rail corridor between approximately the DC Oshawa GO in the City of Oshawa and Bowmanville Avenue in the Municipality of Clarington (i.e., GO Subdivision Mile 11.67 in the west to CP Belleville Subdivision Mile 164.8 in the east).

The EPR Addendum Study Area for the Project includes the Project Footprint and a 500 m buffer around the Project Footprint. The 500 m buffer area has been included as part of the Study Area as it is recognized that some effects may be experienced outside the Project Footprint. This buffer area represents an area where effects associated with Project construction and/or operation could potentially occur. For example, the off-site migration of dust and noise. Collectively, these areas represent the geographic range over which the potential effects associated with the Project could occur. The Study Area is located in the City of Oshawa and Municipality of Clarington and is presented in Figure 1.1.

It is noted that parts of the Study Area were previously assessed as part of the 2011 EPR and in 2018 to support early planning and data collection, including:

- An Air Quality (AQ) Assessment Report which focused on potential changes to AQ created by the operational phase of the Oshawa to Bowmanville Corridor in 2011. No AQ work was undertaken in 2018.
- A Stage 1 and 2 Archaeological Assessment (AA) was prepared in 2010 in support of the 2011 EPR. The full corridor was not included in the 2010 Stage 1 and Stage 2 AA, it addressed the proposed rail maintenance facility, connection west of Thornton Road South, a layover site off of Rundle Road and the proposed GO station footprints. A Stage 1 AA was drafted in 2018 but was not submitted to Ministry of Tourism Culture and Sport (MTCS).
- A Cultural Heritage Screening Report (CHSR) was drafted in 2018 and was not submitted to MTCS for review. A CHSR was not completed in 2011.
- A Natural Environment Conditions Report was completed as part of the 2011 EPR. A draft Natural Environment report was completed in 2018, field surveys along the corridor and some surveys for Species at Risk (SAR) were undertaken, however some species timing windows were missed.

- In 2011 an Environmental Noise and Vibration Assessment was completed. No work was completed in 2018.
- The 2011 EPR includes a summary level of a Socio-Economic and Land Use Study, a separate report was not prepared. A 2018 report was started but not completely drafted.
- Traffic impacts were assessed as part of the 2011 EPR. A draft Traffic Impact Assessment Existing Conditions Report was completed for Stations B2 Ritson, B3 Courtice, and B4 Bowmanville in 2018. A draft Traffic Impact Assessment report was also prepared for Station B1 Thornton's Corner in 2018.
- A Tree Inventory was not undertaken in 2011 or 2018.

As applicable, information from these previous technical studies have been incorporated into the final studies completed to support this EPR Addendum.

1.3.1.1 Assessment Areas for Technical Studies

The Study Area represents the geographic area within which the required technical studies were completed in support of this EPR Addendum. For each technical study, discipline-specific Assessment Areas have been defined based on the anticipated area of effect within the Study Area. These Assessment Areas shown in Figure 1.2 and summarized in Table 1.1. Assessment Areas were established by applying buffers to the Project Footprint, which was identified based on the Current Conceptual Design. The intent of the additional buffers is to provide flexibility to address minor design changes.

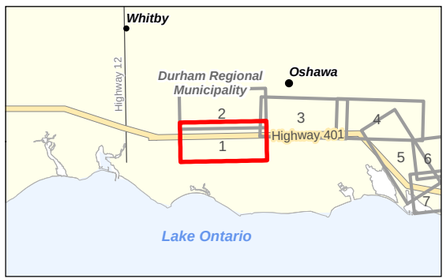
Table 1.1: Assessment Areas for Technical Studies

Environments	Technical Studies	Assessment Area
Biophysical Environment	Natural Environment Technical Report	• A 120 m buffer around Project Footprint. • A 500 m buffer around GO station centre points
	Tree Inventory Technical Report	• Any trees and vegetation within the rail, and any tree dripline that intersects the plane of area impacted.
	Air Quality Technical Report	• A 500 m buffer around the Project Footprint.
	Noise and Vibration Technical Report	• A 500 m buffer around the Project Footprint.

Environments	Technical Studies	Assessment Area
Social and Economic Environment	Socio-Economic and Land Use Characteristics Assessment	• A 500 m buffer around the Project Footprint.
	Traffic Impact Analysis (TIA)	• Focused on 65 intersections in proximity to the proposed alignment and GO station locations.
Cultural Environment	Cultural Heritage Report (CHR): Existing Conditions and Preliminary Impact Assessment	• A 50 m buffer around the Project Footprint.[7] • A 500 m buffer around GO station centre points.
	Stage 1 Archaeological Assessment (AA) Report	• A 20 m buffer along the rail corridor and a 70 m radius buffer at each of the proposed bridge modifications and at-grade crossing widenings. • A 500 m buffer around GO station centre points.

[7] Since the completion of the field program and the identification of an initial Cultural Heritage Assessment Area for the CHR, anticipated Project Footprint has been modified to reflect the design progression throughout the environmental assessment process. As a result, parts of the current Cultural Heritage Assessment Area around the revised Project Footprint do not include a full 50-metre buffer. These areas are along Park Road North, Ritson Road South, Hancock Road and McKnight Road.

STELLAR DRIVE
UMERO DRIVE
THICKSON ROAD SOUTH
TRICONT AVENUE
RBES STREET
Unnamed Tributary
CHAMPLAIN AVENUE
HIGHWAY 401
TRUCK INSPECTION ACCESS
VICTORIA STREET EAST
Corbett Creek
THORNTON ROAD SOUTH
FOX STREET
BLOOR STREET WEST
Existing Durham College Oshawa GO Station
UNDARY ROAD
LAVAL DRIVE
STEVENSON ROAD SOUTH
DORCHESTER DRIVE
SALISBURY STREET
LAVAL STREET
LAVAL COURT
HILLSIDE AVENUE
SEVERN STREET
LISBON COURT



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Legend

- Existing Durham College Oshawa GO Station
- Existing Railway
- Proposed Corridor (2021)
- Watercourse
- Project Footprint / Tree Inventory Assessment Area
- Cultural Heritage Assessment
- Archaeology Assessment
- Natural Environment Assessment
- Air Quality Assessment Area / Noise and Vibration Assessment Area / Socio-Economic and Land Use Characteristics Assessment Area

Traffic Impact Analysis Intersection

- Intersection
- Future Intersection

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Stantec

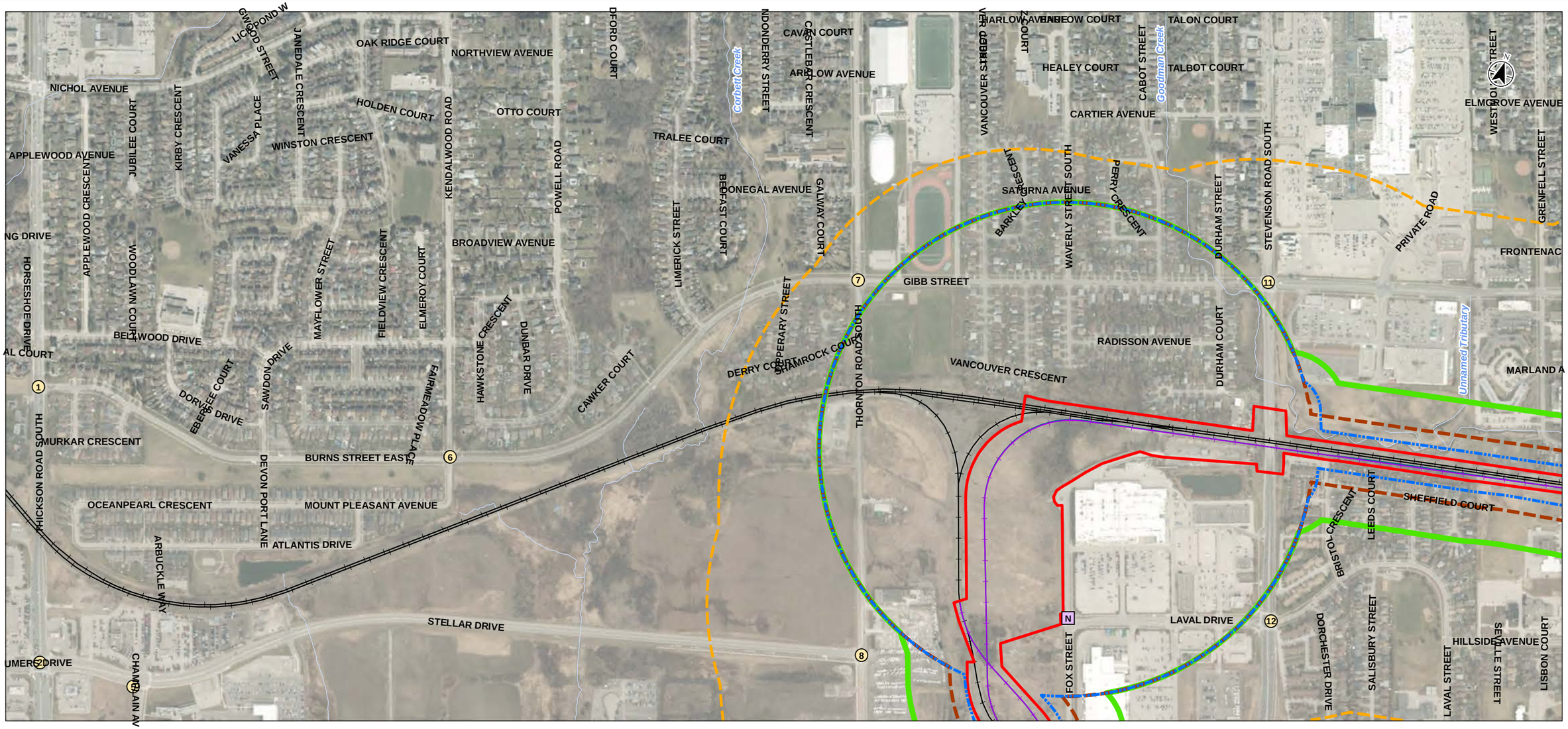
Project Location
Regioan Municipality of Durham

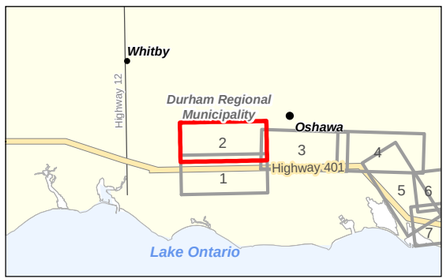
165011019 REVA
Prepared by BCC on 2023-08-22
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2.1

Title
Assessment Areas for Technical Studies





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Legend

- Existing Railway
- Proposed Corridor (2021)
- Watercourse
- Project Footprint / Tree Inventory Assessment Area
- Cultural Heritage Assessment
- Archaeology Assessment
- Natural Environment Assessment
- Air Quality Assessment Area / Noise and Vibration Assessment Area / Socio-Economic and Land Use Characteristics Assessment Area

Traffic Impact Analysis Intersection

- Intersection
- Future Intersection

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Regioan Municipality of Durham	Prepared by BCC on 2023-08-22
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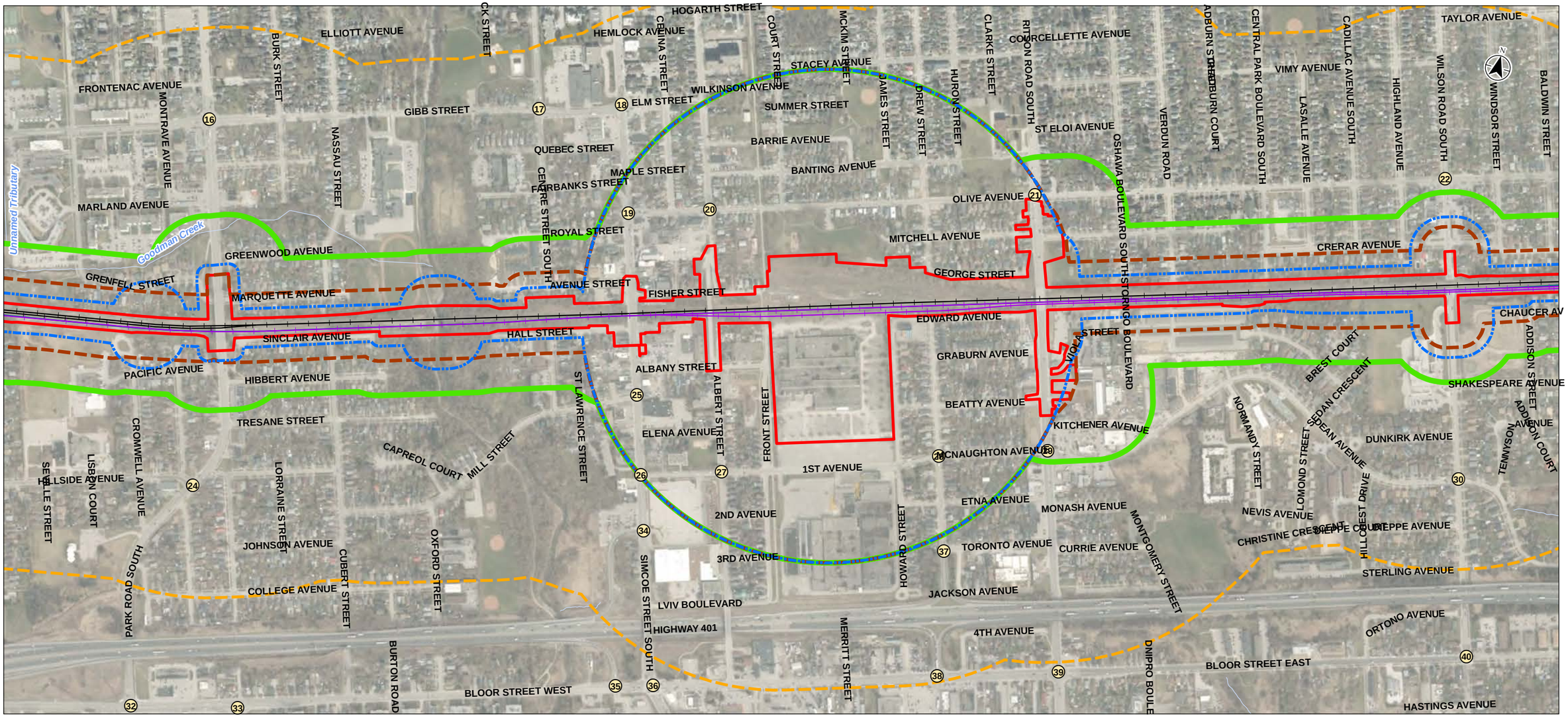
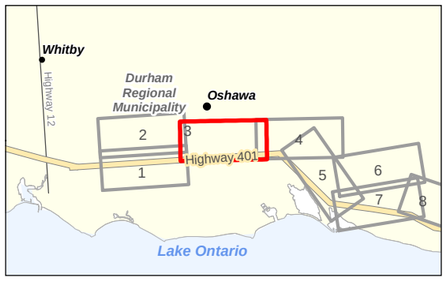
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2.2

Title
Assessment Areas for Technical Studies





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Legend

- Existing Railway
- Proposed Corridor (2021)
- Watercourse
- Project Footprint / Tree Inventory Assessment Area
- Cultural Heritage Assessment
- Archaeology Assessment
- Natural Environment Assessment
- Air Quality Assessment Area / Noise and Vibration Assessment Area / Socio-Economic and Land Use Characteristics Assessment Area

Traffic Impact Analysis Intersection

- Intersection

0 200 400 m

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Project Location	165011019 REVA
Regioan Municipality of Durham	Prepared by BCC on 2023-08-22
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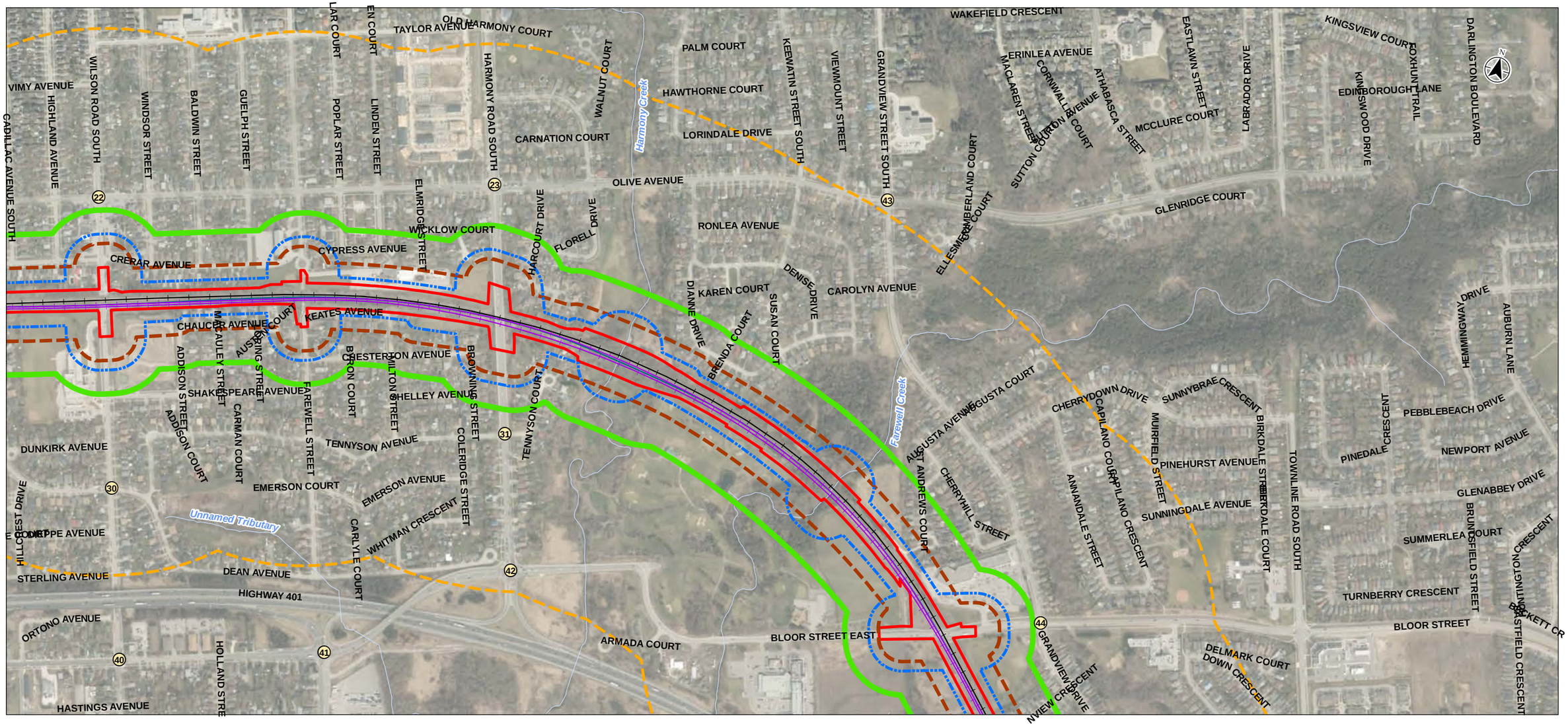
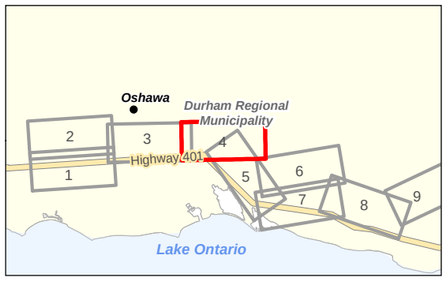
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2.3

Title
Assessment Areas for Technical Studies





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Legend

- Existing Railway
- Proposed Corridor (2021)
- Watercourse
- Project Footprint / Tree Inventory Assessment Area
- Cultural Heritage Assessment
- Archaeology Assessment
- Natural Environment Assessment
- Air Quality Assessment Area / Noise and Vibration Assessment Area / Socio-Economic and Land Use Characteristics Assessment Area

Traffic Impact Analysis Intersection

- Intersection

0 200 400 m

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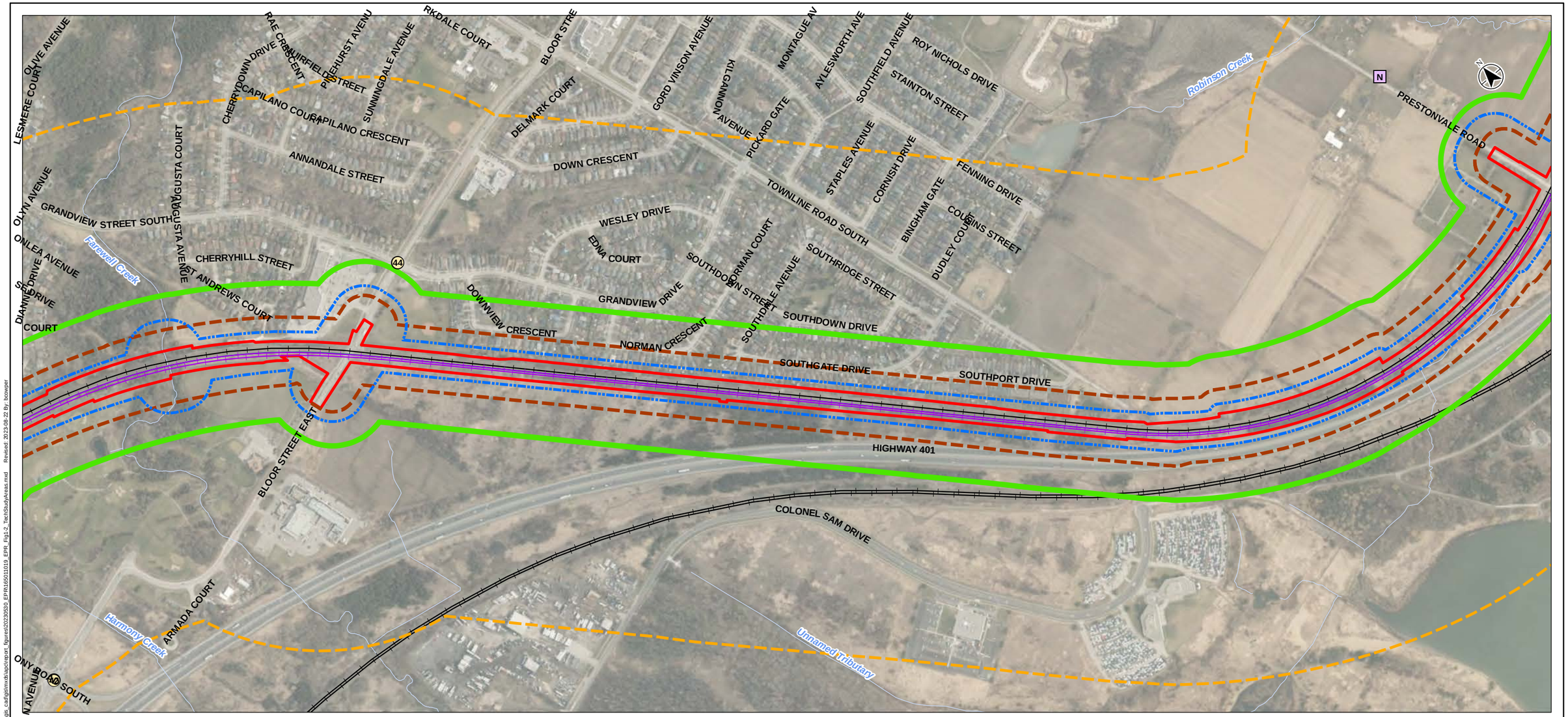
Project Location	165011019 REVA
Regioan Municipality of Durham	Prepared by BCC on 2023-08-22
	Technical Review by ABC on yyyy-mm-dd
	Independent Review by ABC on yyyy-mm-dd

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2.4

Title
Assessment Areas for Technical Studies



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Legend

- Existing Railway
- Proposed Corridor (2021)
- Watercourse
- Project Footprint / Tree Inventory Assessment Area
- Cultural Heritage Assessment
- Archaeology Assessment
- Natural Environment Assessment
- Air Quality Assessment Area / Noise and Vibration Assessment Area / Socio-Economic and Land Use Characteristics Assessment Area

Traffic Impact Analysis Intersection

- Intersection
- Future Intersection

0 200 400 m

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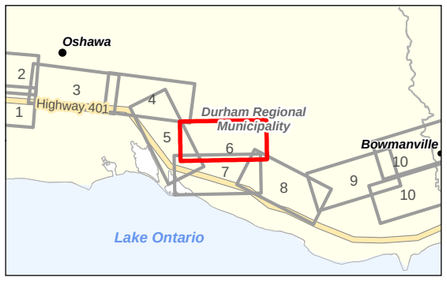
Stantec

Project Location	165011019 REVA
Regioan Municipality of Durham	Prepared by BCC on 2023-08-22
	Technical Review by ABC on yyyy-mm-dd
	Independent Review by ABC on yyyy-mm-dd

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2.5

Title
Assessment Areas for Technical Studies



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Legend

- Watercourse
- Cultural Heritage Assessment
- Archaeology Assessment
- Natural Environment Assessment
- Air Quality Assessment Area / Noise and Vibration Assessment Area / Socio-Economic and Land Use Characteristics Assessment Area

Traffic Impact Analysis Intersection

- Intersection
- Future Intersection

0 200 400 m

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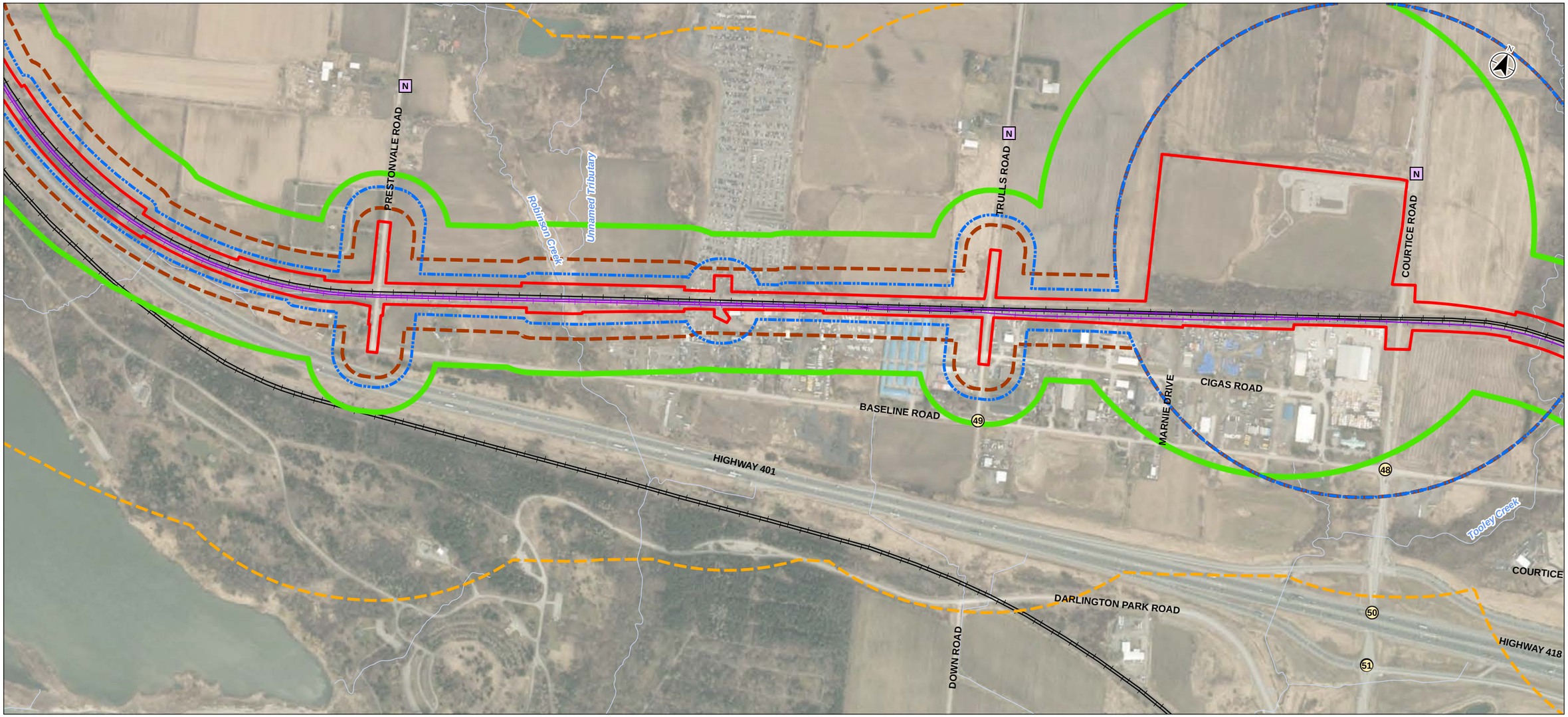
Stantec

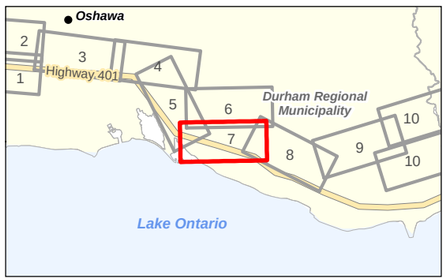
Project Location Regioan Municipality of Durham	165011019 REVA Prepared by BCC on 2023-08-22 Technical Review by ABC on yyyy-mm-dd Independent Review by ABC on yyyy-mm-dd

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2.6

Title
Assessment Areas for Technical Studies





Legend

- Existing Railway
- Proposed Corridor (2021)
- Watercourse
- Project Footprint / Tree Inventory Assessment Area
- Cultural Heritage Assessment
- Archaeology Assessment
- Natural Environment Assessment
- Air Quality Assessment Area / Noise and Vibration Assessment Area / Socio-Economic and Land Use Characteristics Assessment Area

Traffic Impact Analysis Intersection

- Intersection
- Future Intersection

Notes

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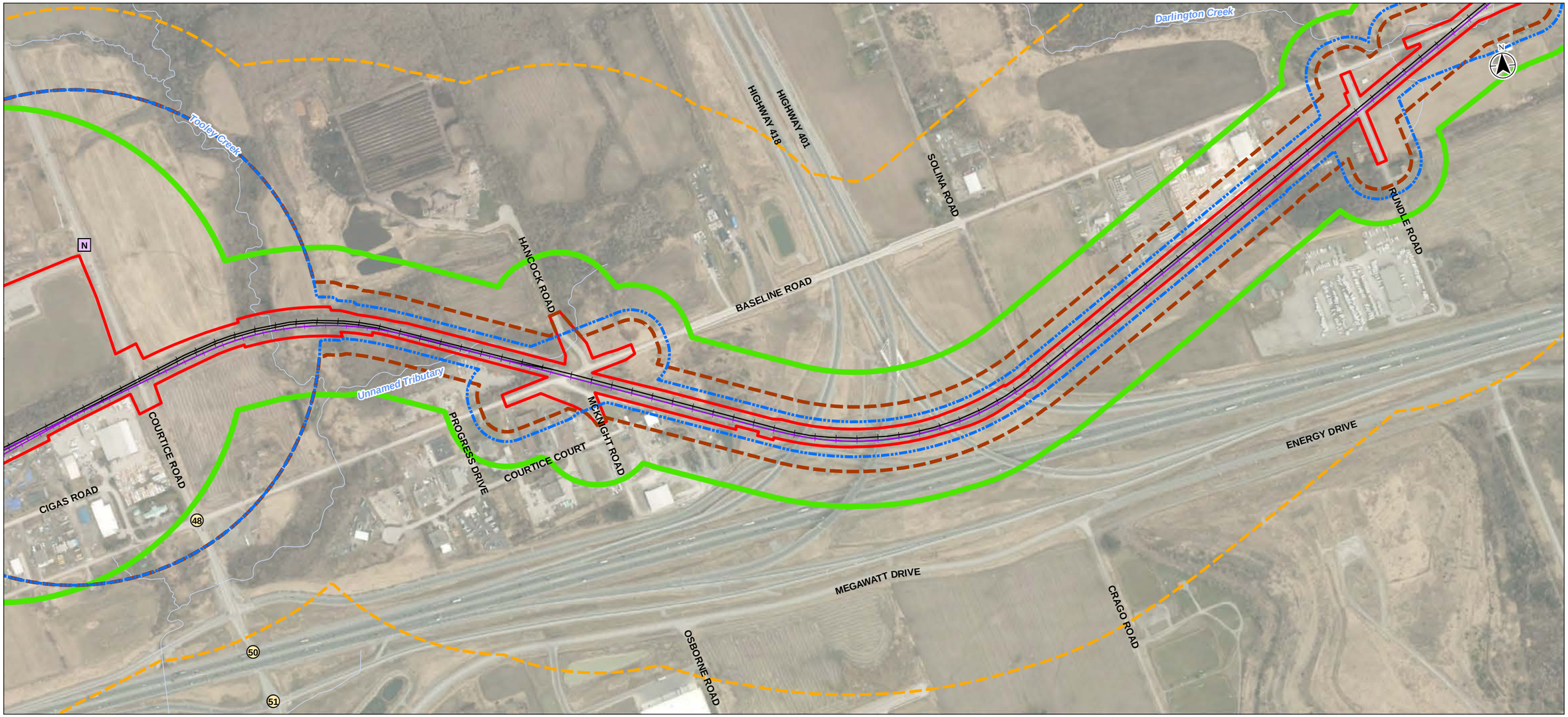
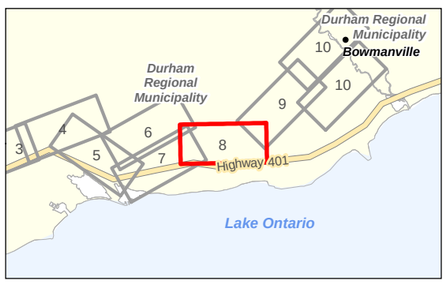
Project Location	165011019 REVA
Regioan Municipality of Durham	Prepared by BCC on 2023-08-22
	Technical Review by ABC on yyyy-mm-dd
	Independent Review by ABC on yyyy-mm-dd

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2.7

Title
Assessment Areas for Technical Studies





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Legend

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Traffic Impact Analysis Intersection

- Intersection
- Future Intersection

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Stantec

Project Location	165011019 REVA
Regioan Municipality of Durham	Prepared by BCC on 2023-08-22
	Technical Review by ABC on yyyy-mm-dd
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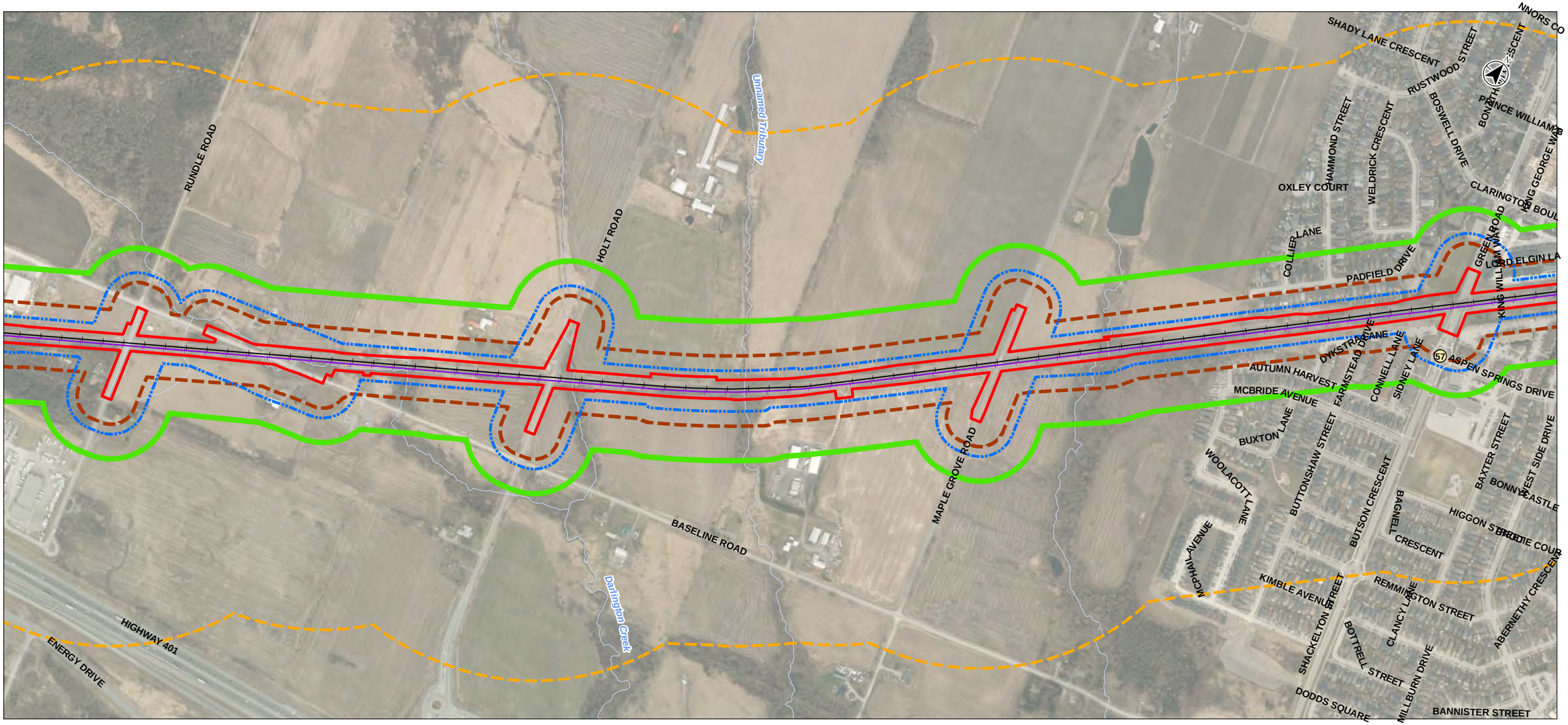
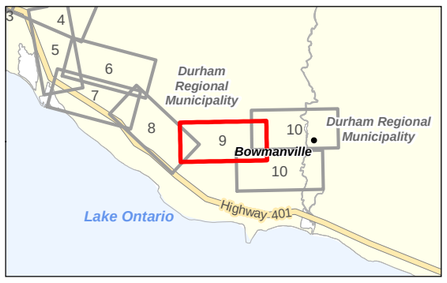
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2.8

Title
Assessment Areas for Technical Studies





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Traffic Impact Analysis Intersection

- Intersection

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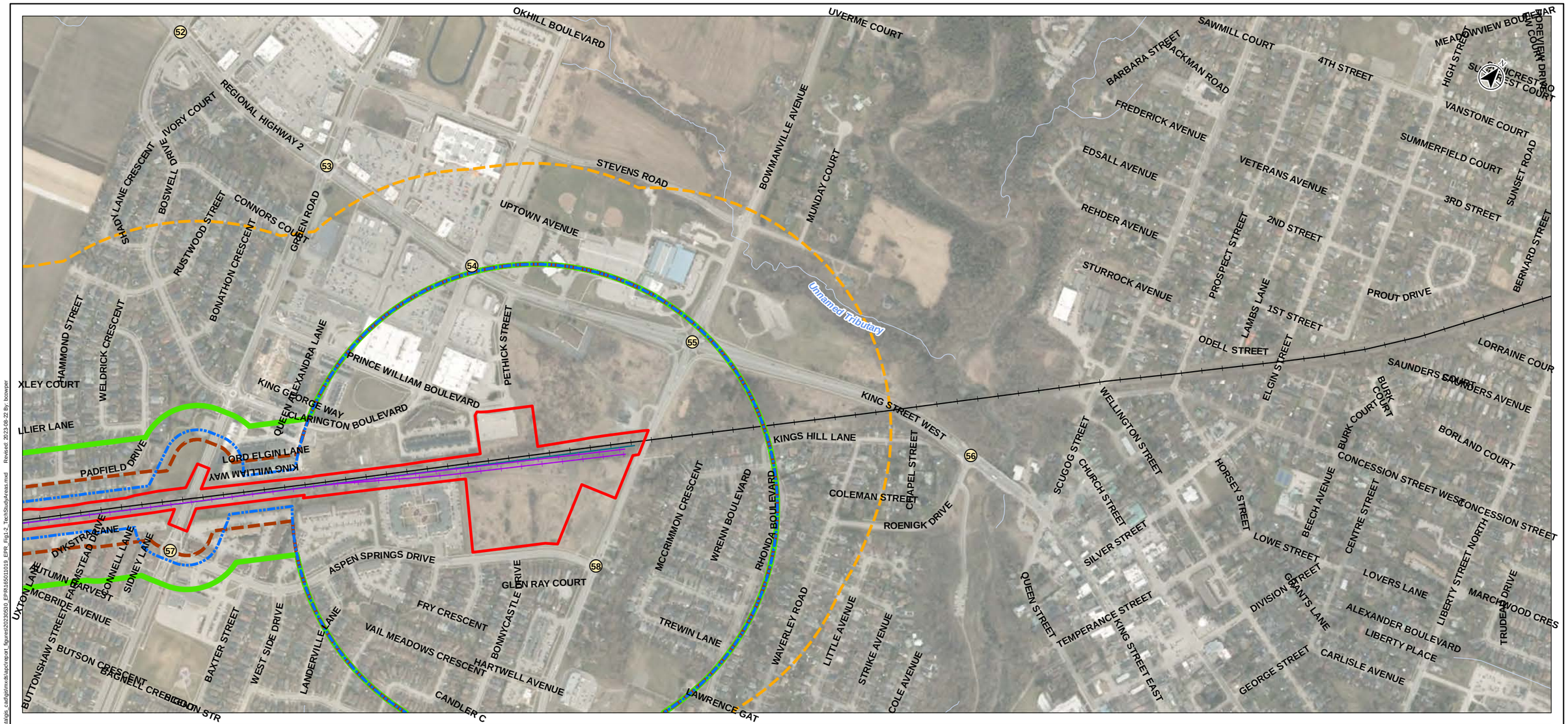
Stantec

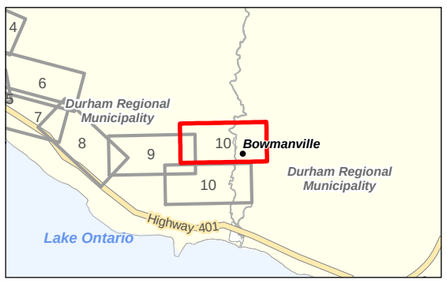
Project Location Regioan Municipality of Durham	165011019 REVA Prepared by BCC on 2023-08-22 Technical Review by ABC on yyyy-mm-dd Independent Review by ABC on yyyy-mm-dd

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2.9

Title
Assessment Areas for Technical Studies





Legend

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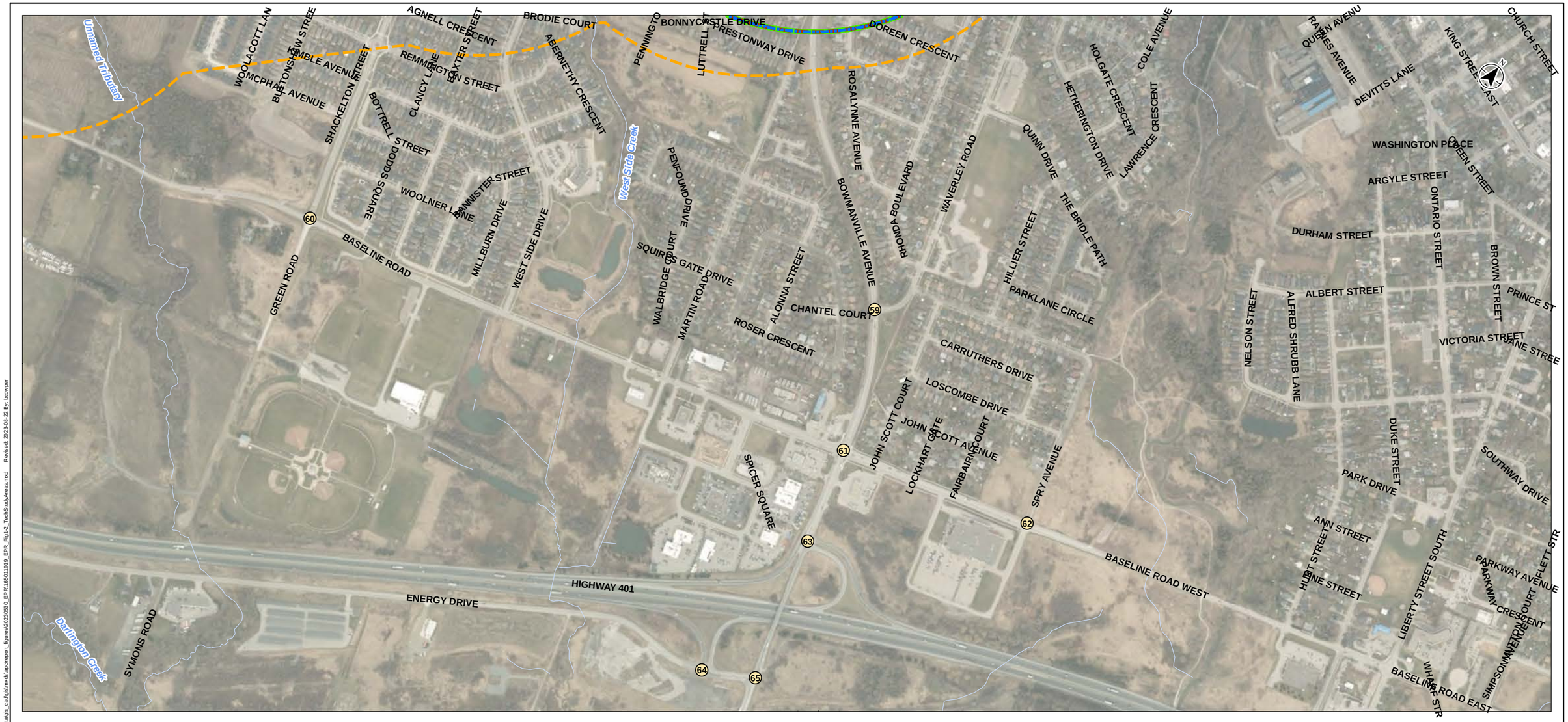
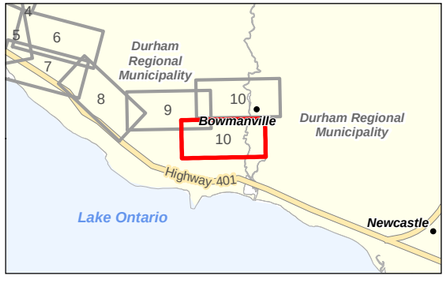
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2.10

Title
Assessment Areas for Technical Studies





Legend

- Watercourse
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Traffic Impact Analysis Intersection

- Intersection

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Regioan Municipality of Durham	Prepared by BCC on 2023-08-22
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Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.2.11

Title
Assessment Areas for Technical Studies

1.3.2 Determination of Significance of Changes

As O. Reg. 231/08 does not define significance, Metrolinx has developed its own approach to determine the extent or degree on whether a proposed change to a project is significant, which determines whether an addendum is required and if consultation is required as part of the addendum process.

Metrolinx identifies three degrees of significance based on the extent of the proposed change. Each triggers progressively higher levels of documentation and reporting, including:

- **Minor:** Includes instances where the changes are evidently insignificant without the need for further analysis (e.g., minor changes to elements at an existing facility, no new property acquisition requirements, no change in potential noise or vibration levels, located in a previously disturbed area with negligible changes to environmental features since 2011). Minor changes would be considered 'Not Significant' based on the requirement of O. Reg. 231/08, and a detailed addendum to the 2011 EPR including regulatory requirements for notice, consultation and Minister consideration would not be required.

- **Not Significant:** Includes instances where the changes are more substantial, but are shown, through initial work, reference to similar work at other locations, or through analysis to have no impacts on the environment. Changes to legislation and existing conditions since 2011 are unlikely to extensively affect results reported in the 2011 EPR. If typical mitigation measures can be employed to avoid negative impacts or manage those impacts to a level previously addressed in the 2011 EPR, a detailed addendum to the 2011 EPR would not be required.

- **Significant:** Includes major changes, new infrastructure or changes to the transit project with a demonstrated impact on the environment (after mitigation). In some cases, the potential for there to be impacts may trigger the classification of the change as significant even though subsequent detailed analysis may determine the change is not significant. The full regulatory addendum procedure (including notice, consultation and Minister consideration) would be followed if the change is determined to have potential for negative impacts beyond what was previously contemplated in the 2011 EPR.

Five criteria were used to determine if a change to a transit project is “Minor”, “Not Significant” or “Significant”. An additional criterion assesses if changes in legislation/guidance materials and/or predicted changes in existing conditions are considered minor, not significant or significant. Criteria include whether the change:

1. Has the potential for an adverse impact on a matter of provincial significance that is related to the natural environment or has cultural heritage value.
2. Has the potential for an adverse impact on a constitutionally protected aboriginal or Treaty right.
3. Is likely to warrant a high degree of public and/or stakeholder interest.
4. Represents a reputational risk to Metrolinx and/or the participating municipality.
5. Represents a major change to the EPR design that was not previously consulted on.
6. Materially affects the findings of the existing conditions in 2011 EPR and/or if recent legislation/guidance materials are expected to result in changes to potential effects.

Project changes were assessed for significance based on the general components identified above. This approach was used to provide a conservative assessment of the overall significance of the design refinements since the completion of the 2011 EPR. Table 1.2 provides the determination of significance for each Project component.

Table 1.2: Determination of Significance

Type	Current Proposed Project Component	2011 EPR Scope	Criteria						Significance	Rationale
			1	2	3	4	5	6		
Linear Facilities	One new GO Mainline Track (from GO Sub - Mile 11.67 to CP's Belleville Sub - Mile 164.8)	The track alignment presented in the 2011 EPR involved reconfiguring the CP Rail mainline to reduce corridor and crossing impacts, including shifting the mainline to the north.	Y	Y	Y	Y	Y	Y	Significant	In the current design, the mainline will not move, with new passenger tracks aligned south of the southernmost existing CP Rail track centerline. Disturbance is expected to extend south of the mainline track centre and include grading and ditching based on ground topography and other requirements identified during detailed design. The CP Rail ROW generally provides at least 50 ft between the mainline centre and the southern boundary, except for some locations where localized deviations provide a reduced clearance area (to as little as 25-30 ft). Based on the space requirements for the new tracks, there is the potential for localized footprint effects and property acquisitions outside of the ROW. The new GM spur was not previously considered. The GM spur is an existing rail corridor and thus is already disturbed; the probability of impacts to cultural, archaeological and natural heritage features is low. An adjusted alignment may result in increased nuisance effects such as noise and vibration at receptor locations. Property impacts and potential acquisitions are possible. Due to the potential for increased effects along the length of the corridor, a high degree of public/stakeholder interest is anticipated, and additional consultation should be undertaken to address this interest. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx.
	One additional new GO Mainline Track (from CP's Belleville Sub - Mile 168.84 – 173.87)		Y	Y	Y	Y	Y	Y	Significant	
	Ancillary Structural Work	Considered at a high level	Y	Y	Y	N	N	N	Not Significant	Although discussed at a summary level in the 2011 EPR, due to the potential for design changes, the location and extent of retaining walls may differ from what was previously assessed. There is the potential for new visual impacts associated with the retaining walls. Mitigation measures for visual impacts were not provided in the 2011 EPR. Depending on the location of retaining walls, potential effects or adverse impacts on constitutionally protected aboriginal or Treaty rights are possible. Considering the 2011 EPR referenced retaining walls which were subject to consultation during the development of that EPR, the potential design changes proposed for this component are considered not significant and there is no need for further analysis.
	Utility Conflict Resolution	Addressed as "Factor" in the effects assessment	N	N	N	N	N	N	Minor	Utilities conflicts are associated with the implementation of other Project components. Potential impacts to utilities during construction align with those described in the 2011 EPR. No additional potential effects or adverse impacts on constitutionally protected aboriginal or Treaty rights are anticipated. Considering potential effects to utilities were evaluated in the 2011 EPR and subject to consultation during the development of that EPR, the design changes proposed for this component are considered minor and there is no need for further analysis.

Type	Current Proposed Project Component	2011 EPR Scope	Criteria						Significance	Rationale
			1	2	3	4	5	6		
Bridges	DC Oshawa GO - Pedestrian bridge extension to access the Via Rail Canada Inc. (VIA) platform	Not considered	Y	Y	Y	Y	Y	Y	Significant	New crossings present an increased potential for effects to the natural and cultural environment and may affect areas of interest to Indigenous communities. New crossings may also result in additional property impacts and nuisance effects to adjacent properties. As a benefit, a grade separated pedestrian crossing will enhance safety to users. Due to the potential for increased effects at this location, increased public/stakeholder interest is anticipated (at least for adjacent or nearby property owners), and additional consultation should be undertaken to address this interest. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner.
	Highway 401 - new bridge to be located to the east of the existing bridge	Not considered	Y	Y	Y	Y	Y	Y	Significant	New crossings present an increased potential for effects to the natural and cultural environment and may affect areas of interest to Indigenous communities. New crossings may also result in additional property impacts and nuisance effects to adjacent properties. Due to the potential for increased effects at this location, increased public/stakeholder interest is anticipated (at least for adjacent or nearby property owners), and additional consultation should be undertaken to address this interest. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner.
	GM Spur - new GO Track will pass over the realigned GM Spur track	Not considered	Y	Y	Y	Y	Y	Y	Significant	New crossings present an increased potential for effects to the natural and cultural environment and may affect areas of interest to Indigenous communities. New crossings may also result in additional property impacts and nuisance effects to adjacent properties. Due to the potential for increased effects at this location, increased public/stakeholder interest is anticipated (at least for adjacent or nearby property owners), and additional consultation should be undertaken to address this interest. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner.
	Stevenson Road Bridge – widen road overpass and replacement of existing south abutment to accommodate 1 new GO Track [CP Mile 175.08]	Retaining wall – 3 tracks under middle span and 1 track under south span using retaining wall; retaining wall to protect south abutment	N	N	Y	N	N	N	Not Significant	The current proposed bridge structure is similar to that of the structure described and assessed in the 2011 EPR. No substantial deviation in footprint is anticipated and no property impacts are planned with the current design. No change in the assessment of potential effects to the natural or cultural heritage environments is anticipated as existing conditions are not expected to have changed since 2011 and the footprint assessed in 2011 aligns with the current footprint of the structure. Potential noise and vibration effects during construction align with those described in the 2011 EPR and updates to align with the recent guidance materials are not expected to substantially alter the 2011 results in this scenario. AQ during construction was not previously assessed, but mitigation measures for typical construction emissions will be implemented to avoid net negative effects. Stevenson Road will be closed for several months during construction which will affect vehicles, cyclists and pedestrians, in comparison to the 2011 design which would not have required a road closure of this duration. No additional potential effects or adverse impacts on constitutionally protected aboriginal or Treaty rights are anticipated. Considering a similar bridge design was evaluated in the 2011 EPR and subject to consultation during the development of that EPR, the design changes proposed for this component are considered not significant and there is no need for further analysis.

Type	Current Proposed Project Component	2011 EPR Scope	Criteria						Significance	Rationale
			1	2	3	4	5	6		
Bridges cont.	Park Road Bridge – widen road overpass and replacement of existing south abutment to accommodate 1 new GO Track [CP Mile 174.55]	Retaining wall – 3 tracks under middle span and 1 track under south span using retaining wall; retaining wall to protect south abutment	N	N	Y	N	N	N	Not Significant	The current proposed bridge structure is similar to that of the structure described and assessed in the 2011 EPR. No substantial deviation in footprint is anticipated and no property impacts are planned with the current design. No change in the assessment of potential effects to the natural or cultural heritage environments is anticipated as existing conditions are not expected to have changed since 2011 and the footprint assessed in 2011 aligns with the current footprint of the structure. Potential noise and vibration effects during construction align with those described in the 2011 EPR and updates to align with the recent guidance materials are not expected to substantially alter the 2011 results in this scenario. AQ during construction was not previously assessed, but mitigation measures for typical construction emissions will be implemented to avoid net negative effects. Park Road will be closed for several months during construction which will affect vehicles, cyclists and pedestrians, in comparison to the 2011 design which would not have required a road closure of this duration. No additional potential effects or adverse impacts on constitutionally protected aboriginal or Treaty rights are anticipated. Considering a similar bridge design was evaluated in the 2011 EPR and subject to consultation during the development of that EPR, the design changes proposed for this component are considered not significant and there is no need for further analysis.
	Oshawa Creek Bridge – new bridge on separate alignment south of the existing bridge to carry 1 new GO Track [CP Mile 174.28]	Add 1 railway bridge on south side of existing bridge	N	N	N	N	N	N	Minor	The current proposed bridge structure is similar to that of the structure described and assessed in the 2011 EPR. No substantial deviation in footprint is anticipated and no property impacts are planned with the current design. No change in the assessment of potential effects to the natural or cultural heritage environments is anticipated as existing conditions are not expected to have changed since 2011. The footprint assessed in 2011 aligns with the current footprint of the structure and the bridge supporting structures will be placed outside of the high-water mark. Potential noise and vibration effects during construction align with those described in the 2011 EPR and updates to align with the recent guidance materials are not expected to substantially alter the 2011 results in this scenario. AQ during construction was not previously assessed, but mitigation measures for typical construction emissions will be implemented to avoid net negative effects. No additional potential effects or adverse impacts on constitutionally protected aboriginal or Treaty rights are anticipated. Considering a similar bridge design was evaluated in the 2011 EPR and subject to consultation during the development of that EPR, the design changes proposed for this component are considered minor and there is no need for further analysis.
	Simcoe Street Bridge – remove existing structure and reconstruct road overpass [CP Mile 174.04]	Add 1 track under road south of existing CP Rail line; no structural work required	Y	Y	Y	Y	Y	Y	Significant	Structural work is now being considered as part of the Project, representing a change from the 2011 scope. Structural works have the potential to result in new areas of disturbance and other associated potential effects to matters of provincial significance. There is also the potential for greater interest from Indigenous communities, the public and other stakeholders and additional consultation should be undertaken to address this interest. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner

Type	Current Proposed Project Component	2011 EPR Scope	Criteria						Significance	Rationale
			1	2	3	4	5	6		
Bridges cont.	Albert Street Bridge – bridge removal and road closure	Add 1 track under road south of existing CP Rail line; no structural work required	Y	Y	Y	Y	Y	Y	Significant	The bridge is proposed to be removed, representing a change from the 2011 scope. Removal of the bridge has the potential to result in potential effects related to socio-economic environment and traffic patterns. There is also the potential for greater interest from Indigenous communities, the public and other stakeholders and additional consultation should be undertaken to address this interest. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner
	Front Street Multi-Use Crossing (Michael Starr Trail) – new non-vehicular grade separation [CP Mile 173.87]	Not considered	Y	Y	Y	Y	Y	Y	Significant	New crossings present an increased potential for effects to the natural and cultural environment and may affect areas of interest to Indigenous communities. New crossings may also result in additional property impacts and nuisance effects to adjacent properties. As a benefit, a grade separated multi-use crossing will enhance safety to users. Due to the potential for increased effects at this location, increased public/stakeholder interest is anticipated (at least for adjacent or nearby property owners), and additional consultation should be undertaken to address this interest. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner.
	Ritson Road Bridge – remove existing structure and reconstruct road overpass [CP Mile 173.52]	Add 1 track under road, north & south of existing CP Rail line; no structural work considered	Y	Y	Y	Y	Y	Y	Significant	Structural work is now being considered as part of the Project, representing a change from the 2011 scope. Structural works have the potential to result in new areas of disturbance and other associated potential effects to matters of provincial significance. There is also the potential for greater interest from Indigenous communities, the public and other stakeholders and additional consultation should be undertaken to address this interest. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner.
	Wilson Road Bridge – new bridge on separate alignment south of the existing bridge to carry 2 new GO Tracks [CP Mile 173.01]	Use track deck on north side by track shift (rail over road); no structural work considered	Y	Y	Y	Y	Y	Y	Significant	Structural work is now being considered as part of the Project, representing a change from the 2011 scope. Structural works have the potential to result in new areas of disturbance and other associated potential effects to matters of provincial significance. There is also the potential for greater interest from Indigenous communities, the public and other stakeholders and additional consultation should be undertaken to address this interest. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner.
	Farewell Street Multi-Use Bridge – replace non-vehicular multi-use crossing (bridge) [CP Mile 172.75]	New multi-use bridge for 100 ft over rail corridor	Y	N	N	N	N	Y	Not Significant	The description of the scope of work remains the same as in 2011 and thus does not deviate from the assessment that was already completed in the 2011 EPR. No substantial deviation in footprint is anticipated and no property impacts are planned with the current design. However, heritage studies undertaken in support of this EPR Addendum identified the Farewell Street Multi-Use Bridge as a built heritage resource (BHR); this is new information that was not included in the 2011 EPR. There is no change in the assessment of potential effects to the bridge (i.e., it is still being removed), but additional consideration of mitigation measures will be required based on identification of the bridge as a BHR.

Type	Current Proposed Project Component	2011 EPR Scope	Criteria						Significance	Rationale
			1	2	3	4	5	6		
Bridges cont.	Harmony Road Bridge – widen road over pass and replacement of existing south abutment to accommodate 2 new GO Tracks [CP Mile 172.49]	Road over rail – run tracks through middle spans; no structural work considered	N	N	Y	N	N	N	Not Signifcant	The current proposed bridge structure is similar to that of the structure described and assessed in the 2011 EPR. No substantial deviation in footprint is anticipated and no property impacts are planned with the current design. No change in the assessment of potential effects to the natural or cultural heritage environments is anticipated as existing conditions are not expected to have changed since 2011 and the footprint assessed in 2011 aligns with the current footprint of the structure. Potential noise and vibration effects during construction align with those described in the 2011 EPR and updates to align with the recent guidance materials are not expected to substantially alter the 2011 results in this scenario. AQ during construction was not previously assessed, but mitigation measures for typical construction emissions will be implemented to avoid net negative effects. Harmony Road will be closed for several months during construction which will affect vehicles, cyclists and pedestrians, in comparison to the 2011 design which would not have required a road closure of this duration. No additional potential effects or adverse impacts on constitutionally protected aboriginal or Treaty rights are anticipated. Considering a similar bridge design was evaluated in the 2011 EPR and subject to consultation during the development of that EPR, the design changes proposed for this component are considered not significant and there is no need for further analysis.
	Harmony Creek Bridge – new bridge on separate alignment south of the existing bridge to carry 2 new GO Tracks [CP Mile 172.32]	Add one bridge on the north side of existing bridge; expand existing one track to north	Y	Y	Y	Y	Y	Y	Significant	Although a similar scope of work was contemplated in 2011, the new design would result in the expansion of the existing bridge to the south as opposed to the north. Given that this bridge is located over a natural feature, there is a greater potential for site-specific footprint disturbance that affect sensitive natural features, resulting in public/stakeholder/Indigenous community concern. Additional consultation should be undertaken to address the deviation from the scope of work proposed in 2011. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner.
	Farewell Creek Bridge – new bridge on separate alignment south of the existing bridge to carry 2 new GO Tracks [CP Mile 172.0]	Add one track extension on south side of existing box culvert (old bridge replaced)	Y	Y	Y	Y	N	Y	Significant	Although a similar scope of work was contemplated in 2011, the new design would result in a larger expansion of the existing bridge. Given that this bridge is located over a natural feature, there is a greater potential for in site-specific footprint disturbance that affect sensitive natural features, resulting in public/stakeholder/Indigenous community concern. Additional consultation should be undertaken to address the deviation from the scope of work proposed in 2011. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner.

Type	Current Proposed Project Component	2011 EPR Scope	Criteria						Significance	Rationale
			1	2	3	4	5	6		
Bridges cont.	Courtice Road Bridge – widen road overpass and replacement of existing south abutment to accommodate 1 new GO Track [CP Mile 168.79]	Road over rail - add 1 track under main span south side; no structural work considered	N	N	Y	N	N	N	Not Significant	The current proposed bridge structure is similar to that of the structure described and assessed in the 2011 EPR. No substantial deviation in footprint is anticipated and no property impacts are planned with the current design. No change in the assessment of potential effects to the natural or cultural heritage environments is anticipated as existing conditions are not expected to have changed since 2011 and the footprint assessed in 2011 aligns with the current footprint of the structure. Potential noise and vibration effects during construction align with those described in the 2011 EPR and updates to align with the recent guidance materials are not expected to substantially alter the 2011 results in this scenario. AQ during construction was not previously assessed, but mitigation measures for typical construction emissions will be implemented to avoid net negative effects. Courtice Road will be closed for several months during construction which will affect vehicles, cyclists and pedestrians, in comparison to the 2011 design which would not have required a road closure of this duration. No additional potential effects or adverse impacts on constitutionally protected aboriginal or Treaty rights are anticipated. Considering a similar bridge design was evaluated in the 2011 EPR and subject to consultation during the development of that EPR, the design changes proposed for this component are considered not significant and there is no need for further analysis.
	Green Road Bridge – new bridge on separate alignment south of the existing bridge to carry 1 new GO Track [CP Mile 165.41]	Others to rebuild to protect for four tracks north, two south of existing; no structural work considered	Y	Y	Y	Y	Y	Y	Significant	Structural work is now being considered as part of the Project, representing a change from the 2011 scope. Structural works have the potential to result in new areas of disturbance and other associated potential effects to matters of provincial significance. There is also the potential for greater interest from Indigenous communities, the public and other stakeholders and additional consultation should be undertaken to address this interest. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner.
At-Grade Crossing Widenings	Bloor Street – widen crossing [CP Mile 171.74]	Not considered	N	N	N	N	N	N	Minor	Although not explicitly identified in the 2011 EPR text, the additional tracks over at-grade crossings are identified in the plans in Appendix H to the 2011 EPR (Plans and Profiles). Tracks will still be required to cross the identified roads at locations where at-grade crossings currently exist. At-grade crossings at Bloor Street, Trulls Road, Baseline Road (two [2] crossings), Rundle Road, and Holt Road currently have gated crossings with warning lights. The crossing at Prestonvale Road has warning lights, but no gates. The private crossing has no crossing protection. At-grade crossing locations are previously disturbed, which limits the level of impact to environmental features, however site-specific design may result in additional ground disturbance outside of the existing footprint but within the rail ROW.
	Prestonvale Road – widen crossing [CP Mile 170.07]	Not considered	N	N	N	N	N	N	Minor	
	Private Crossing for Dom's Auto – widen crossing [CP Mile 169.7]	Not considered	N	N	N	N	N	N	Minor	
	Trulls Road – widen crossing [CP Mile 169.31]	Not considered	N	N	N	N	N	N	Minor	
	Baseline Road – widen crossing [CP Mile 168.22]	Not considered	N	N	N	N	N	N	Minor	Mitigation measures for typical construction activities (i.e., erosion and sedimentation, air emissions) are well known and will be applied to the Project as a whole. The at-grade crossings are located in rural areas where traffic levels are expected to be low, and detours or delays would be unlikely to have network wide impacts. The increased train traffic during operations was assessed in the 2011 EPR and does not require re-assessment at this time as there has been a decreased in the assumed train numbers/frequency for the ultimate rail traffic. Similarly, noise and vibration resulting from train traffic and warning signals was considered in the 2011 EPR and updates to align with the recent guidance materials are not expected to substantially alter the 2011 results in this scenario. Further analysis of the at-grade crossings in the EPR Addendum is not required as the changes to the existing at-grade crossings are considered minor, no new property impacts are anticipated, and there will be no substantial change in the potential effects or mitigation measures identified in the 2011 EPR.
	Rundle Road – widen crossing [CP Mile 167.08]	Not considered	N	N	N	N	N	N	Minor	
	Baseline Road – widen crossing [CP Mile 166.92]	Not considered	N	N	N	N	N	N	Minor	
	Holt Road – widen crossing [CP Mile 166.55]	Not considered	N	N	N	N	N	N	Minor	

Type	Current Proposed Project Component	2011 EPR Scope	Criteria						Significance	Rationale
			1	2	3	4	5	6		
At-Grade Crossing Widenings cont.	Private Crossing West of Maple Grove Road – widen crossing [CP Mile 166.18]	Not considered	N	N	N	N	N	N	Minor	
	Maple Grove Road – widen crossing [CP Mile 165.96]	Not considered	N	N	N	N	N	N	Minor	
GO Stations	Fox Street GO Station (B1 Thornton's Corners East)	Considered at an alternate location	Y	Y	Y	Y	Y	Y	Significant	Although a similar scope of work was contemplated in 2011 at a different location, the relocated B1 Thornton's Corners GO Station location has the potential for public/stakeholder/Indigenous community concern. Additional consultation should be undertaken to address the deviation from the scope of work proposed in 2011. Failing to assess this change in an open and transparent process may present a reputational risk to Metrolinx. Additional consultation is required to assess this change in an open and transparent manner. Additionally, potential environmental effects may also differ from those described in the 2011 EPR given the new location for the B1 Thornton's Corners GO Station location. There will be new areas of disturbance (i.e., areas not previously assessed) and other associated potential effects to matters of provincial significance.
	Front Street GO Station (B2 Ritson)	Considered	N	N	Y	N	N	N	Not significant	Considering a similar footprint was evaluated in the 2011 EPR and subject to consultation during the development of that EPR, the design changes proposed for this component are considered not significant. However, stations will have a more direct interface with the public on a permanent basis (potentially enhancing public interest on this component), while the rest of the Project is infrastructure based within existing ROWs. As such, a description of the GO stations is included in the EPR Addendum to provide consistency from a communications perspective, even where the potential for impacts may not have changed substantially from 2011.
	Courtice Road GO Station (B3 Courtice)	Considered	N	N	Y	N	N	N	Not significant	Considering a similar footprint was evaluated in the 2011 EPR and subject to consultation during the development of that EPR, the design changes proposed for this component are considered not significant. However, stations will have a more direct interface with the public on a permanent basis (potentially enhancing public interest on this component), while the rest of the Project is infrastructure based within existing ROWs. As such, a description of the GO stations is included in the EPR Addendum to provide consistency from a communications perspective, even where the potential for impacts may not have changed substantially from 2011.
	Bowmanville Avenue GO Station (B4 Bowmanville)	Considered	Y	N	Y	Y	Y	Y	Significant	A similar footprint was evaluated in the 2011 EPR however an update from the 2011 EPR is that the Bowmanville GO Station may include facilities to allow for parking trains overnight while not in service. The Bowmanville GO Station will include wayside power infrastructure and may include protective measures for fueling considerations. As such, this GO station is included in the EPR Addendum as there is the potential for additional impacts from those reported in 2011.

Based on the analysis and rationale presented in Table 1.2, the following Project components are considered “Significant” and warrant further analysis in this EPR Addendum, including a comprehensive assessment of potential effects, proposed mitigation measures and recommended monitoring:

- New GO Mainline Tracks
- DC Oshawa GO Bridge
- Highway 401 Bridge
- GM Spur Bridge
- Simcoe Street Bridge
- Albert Street Bridge
- Front Street (Michael Starr Trail)
- Ritson Road Bridge
- Wilson Road Bridge
- Harmony Creek Bridge
- Farewell Creek Bridge
- Green Road Bridge
- Fox Street GO Station (B1 Thornton’s Corners East)
- Bowmanville Avenue GO Station (B4 Bowmanville)

Changes assessed as “Not Significant” (Table 1.2) include:

- the two GO station locations that did not change since the 2011 EPR (i.e., Front Street GO Station (B2 Ritson) and Courtice Road GO Station (B3 Courtice))
- Ancillary Structural Work
- Stevenson Road Bridge
- Park Road Bridge
- Farewell Street Multi-Use Bridge
- Harmony Road Bridge
- Courtice Road Bridge

Other Project components identified as “Minor” (Table 1.2) are as follows:

- Utility Conflict Resolution
- Oshawa Creek Bridge

- At-Grade Crossing Upgrades (Bloor Street, Prestonvale Road, Private Crossing for Dom's Auto, Trulls Road, Baseline Road [at two locations], Rundle Road, Holt Road, Private Crossing West of Maple Grove Road, Maple Grove Road)

Figure 1.3 shows the Project components proposed as part of this EPR Addendum in contrast to those evaluated in the 2011 EPR and identifies each component as "Significant", "Not Significant" or "Minor".

In accordance with O. Reg. 231/08 Section 15(3), the determination of "Significant" for the above noted Project components will trigger the need to issue a Notice of EPR Addendum and fully assess and consult on these components.

As standalone items, individual components identified as "Not Significant" may not warrant a detailed analysis in the Addendum process, however given the complexity of the overall Project and the number of components being discussed, these changes are being addressed in the EPR Addendum to effectively consult/engage on the Project and to increase transparency in decision-making.

Project components listed as "Minor" are excluded from further assessment in the EPR Addendum as the level of impact has not changed from 2011 and the existing conditions are not expected to deviate substantially from the original assessment. However, to formally address these "Minor" components in the EPR Addendum, a summary of all Project components is included in the Project Description (Section 2.0).

In summary, this EPR Addendum is considered a Significant Addendum and will assess the potential effects associated with those Project changes categorized as "Significant" and "Not Significant.

Proposed Design

1 : Pedestrian Bridge Extension at Durham College Oshawa GO Station

2 : New Rail Over Road Bridge at Highway 401

3 : New Rail Over Rail Bridge (GO Track Over Realigned CP GM Spur Track)

4 : Fox Street (B1 Thornton's Corners East) GO Station (Proposed GO station delivered through Metrolinx's TOC Program may include parking, passenger pick-up and drop off, bus access point, and bike shelters)

5 : Expanded Road Over Rail Bridge at Stevenson Road

6 : Expanded Road Over Rail Bridge at Park Road

7 : New Rail Bridge Over Oshawa Creek

8 : Road Over Rail Bridge Replacement at Simcoe Street

9 : Bridge Removal at Albert Street

10 : Proposed Multi-Use Crossing at Front Street (Michael Starr Trail)

11 : Front Street (B2 Ritson) GO Station (Proposed GO station delivered through Metrolinx's TOC Program may include parking, passenger pick-up and drop off, bus access point, and bike shelters)

12 : Road Over Rail Bridge Replacement at Ritson Road South

13 : New Rail Over Road Bridge at Wilson Road

14 : Multi-Use Bridge Replacement at Farewell Street

15 : Expanded Road Over Rail Bridge at Harmony Road Bridge

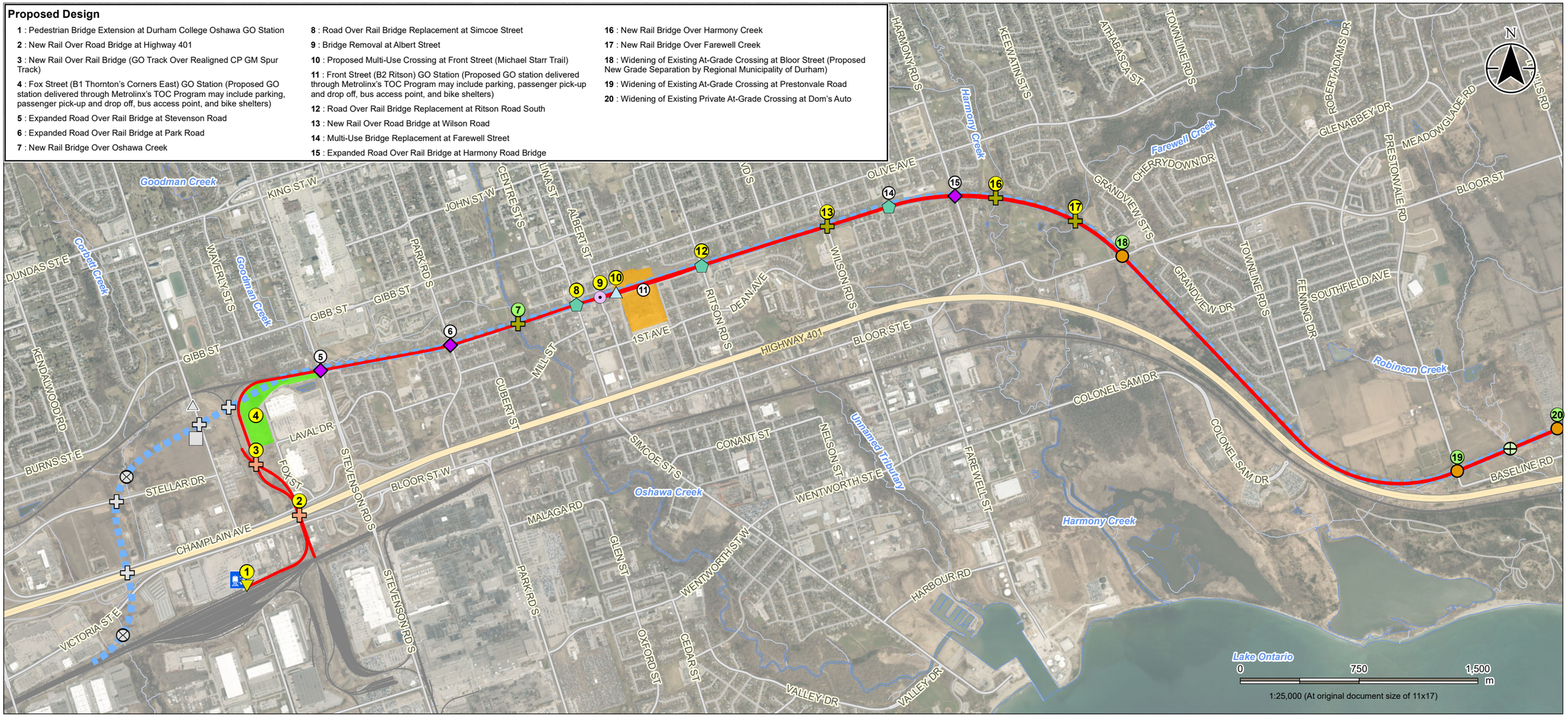
16 : New Rail Bridge Over Harmony Creek

17 : New Rail Bridge Over Farewell Creek

18 : Widening of Existing At-Grade Crossing at Bloor Street (Proposed New Grade Separation by Regional Municipality of Durham)

19 : Widening of Existing At-Grade Crossing at Prestonvale Road

20 : Widening of Existing Private At-Grade Crossing at Dom's Auto



Notes

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Legend

- Existing Railway
- Highway
- Major Road
- Minor Road
- Watercourse
- Waterbody
- Project Components Considered "Significant"
- Project Components Considered "Minor"
- Project Components Considered "Not Significant"

Proposed Design

- Existing Durham College Oshawa GO Station
- Proposed Pedestrian Bridge Extension
- Proposed New Bridge
- Proposed New Multi-Use Grade-Separated Crossing
- Proposed Upgrades to At-Grade Crossing
- Proposed Tracks
- Proposed GO Station Location

Proposed Design and 2011 EPR Design

- Proposed New Bridge
- Proposed Bridge Removal
- Proposed Bridge Replacement
- Proposed Bridge Expansion
- Proposed Culvert Widening
- Proposed GO Station Location

2011 EPR Design

- Proposed New Bridge
- Proposed Proposed Thornton Rd S Grade Separation
- Proposed GO Station Location
- Proposed Box Culvert
- Former Proposed GO Corridor (2011, 2018)

Stantec

Project Location
Regioan Municipality of Durham

165011019 REVA
Prepared by BCC on 2023-08-22
Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.3.1

Title
Significance of Project Changes

Proposed Design

19 : Widening of Existing At-Grade Crossing at Prestonvale Road

20 : Widening of Existing Private At-Grade Crossing at Dom's Auto

21 : Widening of Existing At-Grade Crossing at Trulls Road

22 : Courtice Road (B3 Courtice) GO Station (Proposed GO station delivered through Metrolinx's TOC Program may include parking, passenger pick-up and drop off, bus access point, and bike shelters)

23 : Expanded Road Over Rail Bridge at Courtice Road

24 : Widening of Existing At-Grade Crossing at Baseline Road

25 : Widening of Existing At-Grade Crossing at Rundle Road

26 : Widening of Existing At-Grade Crossing at Baseline Road

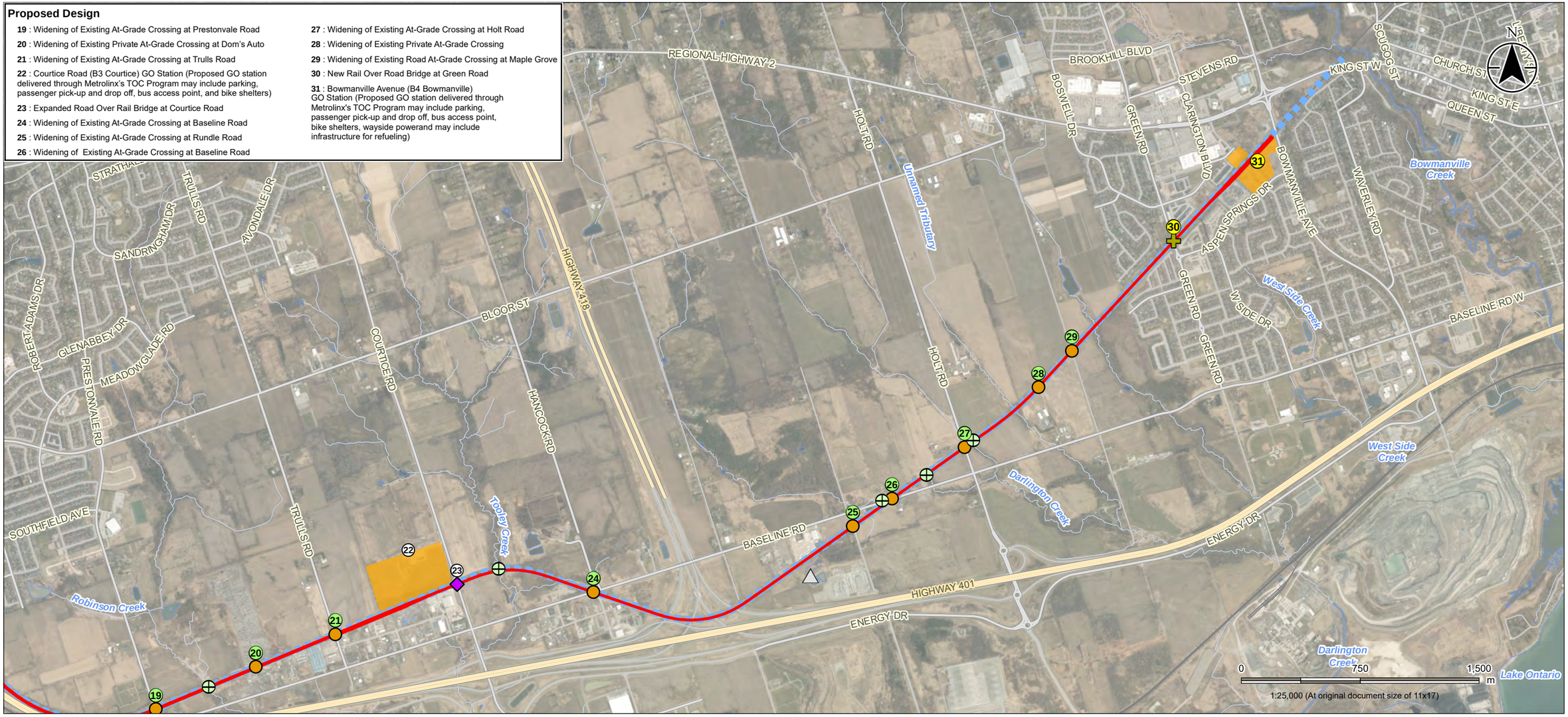
27 : Widening of Existing At-Grade Crossing at Holt Road

28 : Widening of Existing Private At-Grade Crossing

29 : Widening of Existing Road At-Grade Crossing at Maple Grove

30 : New Rail Over Road Bridge at Green Road

31 : Bowmanville Avenue (B4 Bowmanville) GO Station (Proposed GO station delivered through Metrolinx's TOC Program may include parking, passenger pick-up and drop off, bus access point, bike shelters, wayside powerand may include infrastructure for refueling)



Notes

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3. Orthoimagery © First Base Solutions, 2021. Imagery Date, 2019.

Legend

- Existing Railway
- Highway
- Major Road
- Minor Road
- Watercourse
- Waterbody
- Project Components Considered "Significant"
- Project Components Considered "Minor"
- Project Components Considered "Not Significant"

Proposed Design

- Proposed Upgrades to At-Grade Crossing
- Proposed Tracks

Proposed Design and 2011 EPR Design

- Proposed New Bridge
- Proposed Bridge Expansion
- Proposed Culvert Widening
- Proposed GO Station Location

2011 EPR Design

- Proposed Layover
- Former Proposed GO Corridor (2011, 2018)

Stantec

Project Location
Regioan Municipality of Durham

165011019 REVA
Prepared by BCC on 2023-08-22
Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
1.3.2

Title
Significance of Project Changes

1.3.3 Studies Prepared in Support of the TPAP Addendum

This addendum includes supporting technical reports that:

- update existing conditions that were assessed as part of the 2011 EPR and addendum process and address potential for new impacts resulting from the identified Project changes as construction has not begun within 10 years of submitting the Statement of Completion
- document new information that was previously not identified in the original study
- addresses the requirements as stated in O. Reg. 231/08

The addendum provides a summary of the results of these reports, while the more detailed reports are provided as appendices. The following provides a brief overview of the technical studies completed in support of the EPR Addendum:

Natural Environment Technical Report: summarizes the potential natural heritage, including terrestrial and aquatic effects associated with changes, including a corresponding mitigation strategy.

Tree Inventory Technical Report: identifies the location, size, species, condition and category of trees and vegetation, including any tree dripline, and mitigation strategies to reduce impacts during construction and operations.

Air Quality Technical Report: summarizes the potential AQ effects associated with changes to the Project, including mitigation strategies as needed.

Noise and Vibration Technical Report: summarizes the potential noise and vibration effects associated with changes to the Project, including mitigation strategies as needed.

Socio-Economic and Land Use Characteristics Assessment: updates the existing planning policies, neighbourhood and municipal profiles, land use and development applications, built form and visual characteristics, and utilities information for the study area, and identifies the potential socio-economic and land use characteristic effects associated with project changes.

TIA: summarizes the potential traffic effects associated with the project's track, road and structural changes, including mitigation strategies to reduce impacts during construction and operations.

CHR – Existing Conditions and Preliminary Impact Assessment: identifies properties that have the potential to exhibit cultural heritage significance as a result of changes to the Project, including potential effects and mitigation measures described in the CHR - Existing Conditions and Preliminary Impact Assessment.

- **Cultural Heritage Evaluation Reports (CHER):** Based on the recommendations of the CHR, CHERs were completed for specific cultural heritage resources that will be directly impacted to evaluate the cultural heritage resources against the criteria of O. Reg 9/06 and O. Reg 10/06, provide recommendations to the Metrolinx Heritage Committee regarding the level of cultural heritage significance. CHERs were prepared for:
  - 83 Avenue Street, Oshawa
  - 394 Simcoe Street South, Oshawa
  - 399 Simcoe Street South, Oshawa
  - Albert Street Bridge over CPR Tracks, Oshawa
  - 500 Howard Street, Oshawa
  - 356 Ritson Road South, Oshawa
  - 464 Ritson Road South, Oshawa
  - 470 Ritson Road South, Oshawa
  - 359 Ritson Road South, Oshawa
  - 349 Ritson Road South, Oshawa
  - 374 Farewell Street, Oshawa
  - Farewell Street Multi-Use Bridge over CPR Tracks, Oshawa
  - St. Wolodymyr and St. Olha Ukrainian Cemetery, Clarington
  - 1558 Baseline Road, Clarington
  - 1580 Baseline Road, Clarington
  - 1598 Baseline Road, Clarington
  - 2228 Baseline Road, Clarington
  - 1490 Baseline Road West, Clarington
  - 1766 Baseline Road West, Clarington

Stage 1 AA: Provides an overview of the areas having archaeological potential within the Archaeology Assessment Area, potential effects to archaeological resources associated with project changes, and a mitigation strategy, as needed. Two Stage 1 AAs were prepared based on the recommendations of the Stage 1 AAs to address outstanding potential for archaeological resources where relevant within the Project Footprint.

1.4 TPAP and Addendum Process

1.4.1 Content of the EPR Addendum Relative to Section 15 to O.Reg. 231/08

The 2011 Oshawa to Bowmanville Rail Service Expansion and Rail Maintenance Facility EPR was completed under the TPAP as outlined in O.Reg. 231/08. The TPAP is a focused impact assessment process that includes:

- consultation
- an assessment of potential positive and negative impacts
- an assessment of measures to mitigate negative impacts
- documentation in the form of an EPR

As outlined in Section 15 (1) of O. Reg. 231/08, if a proponent wishes to make a change to a transit project that is inconsistent with a completed EPR, an addendum to the EPR must be prepared. An overview of the Addendum process is shown in Figure 1.4. This EPR Addendum fulfills the requirements of Section 15 (1) of O. Reg. 231/08 as presented in Table 1.3.

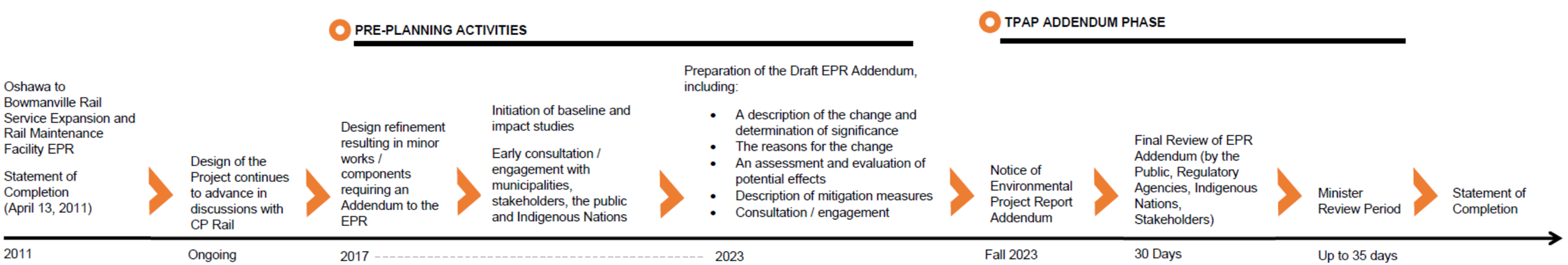
Table 1.3: EPR Addendum Documentation Requirements

Required Information	Section within this EPR Addendum
A description of the change.	Section 1.3
The reasons for the change.	Section 1.1
An assessment and evaluation of any effects that the proposed change might have on the environment.	Section 5.0
A description of any proposed measures for mitigating any negative effects that the proposed Project might have on the environment.	Section 5.10
A statement of whether the proponent (Metrolinx) is of the opinion that the proposed change is significant (or not), and reason for the opinion.	Section 1.3.2

To support this assessment, the following information, that is generally consistent with what is required for a new TPAP, has been included in this Addendum to the EPR:

- update to the project description (Section 2.0)
- summary of existing conditions (Section 4.0)
- a description of the consultation process and activities (Section 7.0)
- commitments to future work (Section 8.5).

Figure 1.4: TPAP Addendum Process



If a project change is considered significant, the proponent is required to publish a Notice of EPR Addendum in the local newspaper and post the notice on the project website. Additionally, the proponent must send the notice to the Director of the Environmental Assessment Branch, Regional Director of MECP, every property owner within 30 m of the site of the change, Indigenous communities who have previously been provided a Notice of Commencement and any other person who may be interested in the change to the transit project.

As described in Section 1.3.2, Project changes have been identified as significant, requiring a Notice of EPR Addendum and Notice to Proceed from the Minister of the Environment, Conservation and Parks (MECP).

1.4.2 EPR Addendum Process

Subsequent to completion of this EPR Addendum, and filing a Notice of EPR Addendum, the EPR Addendum document is made available to the public, regulatory agencies, elected officials, Indigenous communities in accordance with O. Reg. 231/08. Interested persons may submit objections to the transit project within the 30-day period to be considered by the Minister of the Environment, Conservation and Parks (the Minister).

After the 30-day public review period, the Minister has 35 days to consider whether the project may have a negative impact on a matter of provincial importance or a constitutionally protected Aboriginal or Treaty Right and consider any objections received. Whether there is an objection or not, the Minister may issue one of three notices to the proponent:

- a notice to proceed with the transit project as outlined in the Addendum Report
- a notice that requires further steps such as additional study or consultation
- a notice allowing the project to proceed, subject to conditions imposed by the Minister

If the Minister does not act within the 35-day period, the transit project may proceed as planned in the EPR Addendum.

1.4.3 Consultation Program Overview

The consultation program for the EPR Addendum was developed based on the public and stakeholder consultation requirements specified for a TPAP. Section 7.0 contains further details of the consultation activities.

The following approach was used:

- prepare contact list, including Indigenous communities, agencies, property and business owners, community groups
- develop Project website to provide information and engagement
- Notice of Public Meeting and hosting the Public Meeting
- managing comment tracking and responses
- Notice of EPR Addendum

1.4.3.1 Engagement with Indigenous Communities

Metrolinx is committed to building meaningful and long-term relationships with Indigenous communities. Through its Indigenous Relations Office (IRO), Metrolinx engages with Indigenous communities on several projects on an ongoing basis. The following Indigenous communities were identified as being potentially interested in the Project:

- Williams Treaties First Nation
  - Alderville First Nation
  - Beausoleil First Nation
  - Chippewas of Georgina Island
  - Chippewas of Rama First Nation
  - Curve Lake First Nation
  - Hiawatha First Nation
  - Mississaugas of Scugog Island First Nation
- Huron-Wendat Nation
- Kawartha Nishnawbe First Nation
- Métis Nation of Ontario

As part of engagement for the Project, the IRO shared Project notices and reports with identified Indigenous communities and offered opportunities for Indigenous communities to participate in archaeological and environmental fieldwork monitoring for the Project. Further details regarding engagement with Indigenous communities are provided in Section 7.0.

1.5 Planning Context

This Section describe the policies, plans and studies that preceded this TPAP that have helped determine the need for and, eventually, the design considerations for the proposed improvements to the site.

1.5.1 Provincial and Regional Plans and Initiatives

1.5.1.1 Places to Grow Act, 2005

Recognizing that an integrated and coordinated decision-making process across all levels of government is required to build complete and strong communities, make efficient use of existing infrastructure, preserve natural and agricultural resources, and identify where and how growth should occur (e.g., determining priority infrastructure investments), the Government of Ontario passed the *Places to Grow Act, S.O. 2005, C.13* (*Places to Grow Act* 2005, c.13, S. Preamble). The *Places to Grow Act, 2005* enables the Provincial Government to:

- designate any geographic region of the province as a growth area with a specific focus
- develop growth plans in consultation with local officials, stakeholders, public groups, and members of the public and Indigenous communities for a particular region
- make decisions about growth in ways that increase and promote greater housing and transportation options, investments in regional public service facilities in downtown areas, and benefits from infrastructure investments in communities while balancing regional needs for farmland and natural areas
- identify provincially significant employment zones and set out policies that protects these employment areas as they are critical to the local and provincial economy (Ministry of Municipal Affairs and Housing (MMAH) 2013)

Under the *Place to Grow Act, 2005* the Government of Ontario passed growth plans for Northern Ontario and the GGH [8]. The Study Area encompasses areas designated under the Growth Plan for the GGH.

1.5.1.2 A Place to Grow: Growth Plan for the GGH

Prepared and approved under the *Places to Grow Act,* 2005*, A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020* (The Growth Plan), is a long-term planning document that is designed to promote economic growth, increase housing supply, create jobs, and build communities that make life easier, healthier, and more affordable for people of all ages (MMAH 2020a). The Greater Golder Horseshoe is one of the fast-growing regions in North America, making it a destination for many people and businesses. To accommodate such growth, the Growth Plan places a focus on investing in transit infrastructure to support the regional transit network. Intensification in Strategic Growth Areas (SGAs)[9] should be prioritized to make efficient use of infrastructure and public transportation. Land use and infrastructure planning and investment should be integrated by all levels of government, and climate change should be addressed when planning and managing communities and infrastructure.

Carried forward from the 2006 Growth Plan, the 2020 Growth Plan continues to focus on SGAs and Urban Growth Centres [10] (UGC) as long-term focal points for accommodating mixed-use, high-density, and public-transit oriented development (MMAH 2020a). The time horizon for land use planning established in the 2020 Growth Plan is 2051.

Specific to transportation, the 2020 Growth Plan establishes a regional vision for an integrated transit system and sets out to align growth with this vision through the

[8] For the purpose of the GGH Growth Plan, the GGH is defined as growth area under the *Growth Plan Areas Regulation, O. Reg 416/05*, as comprising the following 16 geographic areas: Brant, Dufferin, Durham, Haldimand, Halton, Hamilton, Kawartha Lakes, Niagara, Northumberland, Peel, Peterborough, Simcoe, Toronto, Waterloo, Wellington, and York.

[9] SGAs occur within settlement areas, nodes, corridors, and other areas that have been identified by municipalities or the Province to be the focus for accommodating intensification and higher-density mixed uses in a more compact built form. Strategic growth areas include urban growth centres, major transit station areas, and other major opportunities that may include infill, redevelopment, brownfield sites, the expansion or conversion of existing buildings, or greyfields. Lands along major roads, arterials, or other areas with existing or planned frequent transit service or higher order transit corridors may also be identified as strategic growth areas (MMAH 2020a, 86).

[10] UGCs include: Downtown Peterborough, Downtown Barrie, Newmarket Centre, Downtown Oshawa, Downtown Pickering, Markham Centre, Scarborough Centre, Richmond Holl Centre/Langstaff Gateway, North York Centre, Yonge-Eglinton Centre, Downtown Toronto, Vaughan Metropolitan Centre, Etobicoke Centre, Downtown Brampton, Downtown Mississauga, Downtown Guelph, Downtown Milton, Milton Oakville, Uptown Waterloo, Downtown Kitchener, Downtown Cambridge, Downtown Burlington, Downtown Hamilton, Downtown Brantford, Downtown St. Catharines (MMAH 2019).

implementation of minimum density targets for major transit station areas[11], other SGAs, and UGCs (MMAH 2020a). The 2020 Growth Plan targets a minimum density of 200 residents and jobs combined per hectare for major transit station areas that are served by the GO rail network. The plan also identifies priority transit corridors where, in order to increase benefits from investments in higher-order transit[12], it is expected that municipalities will complete detailed planning for major transit station areas (MMAH 2020a).

The Study Area is south of the Downtown Oshawa UGC and east of the Lakeshore East Rail Corridor priority transit corridor. The implementation of transit-related goals is supported by Metrolinx, a Crown agency of the Government of Ontario, with the mandate to expand transit through the Greater Toronto and Hamilton Area (GTHA).

1.5.1.3 Provincial Policy Statement, 2020

The Provincial Policy Statement (PPS), 2020 sets out the Province's land use vision for how we settle our landscape, create our built environment, and manage our land and resources over the long-term to achieve livable and resilient communities. One of the primary goals of the PPS is building strong healthy communities which is achieved by managing and directing land use to achieve efficient and resilient development and land use patterns.

The Province seeks to promote a mix of residential housing types that are affordable and market-based alongside employment, institutional, recreational, and other land uses that meet the long-term needs of communities (MMAH 2020b). The PPS also seeks to optimize investments in transportation by integrating land use planning with growth management, transit-supportive development, intensification, and infrastructure planning.

[11] Included as a form of SGA, major transit station areas are generally defined as the area within an approximate 500 to 800 metre radius of a transit station, representing about a 10-minute walk (MMAH 2019, 75).
[12] Transit that generally operates in partially or completed dedicated rights-of-way, outside of mixed traffic. Forms include subways, inter-city rail, light rail, and buses in dedicated rights-of-way (MMAH 2019, 73).

The PPS provides direction for designing transportation systems. Section 1.6.7.1 of the PPS states that "transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs" (MMAH 2020b, 20). Connections within and among transportation systems should be maintained and improved where possible to reduce the length and number of vehicle trips while increasing the future use of public and active transportation.

1.5.1.4 Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe

The *Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe* (Ministry of Transportation 2022) provides a 30-year vision for improving transportation systems throughout the GGH. Metrolinx is identified as a key agency that will be involved in working towards meeting the proposed transportation plan and goals. Moreover, Metrolinx has been tasked with aligning its 2041 Regional Transportation Plan (refer to Section 1.5.1.6) with the *Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe.*

1.5.1.5 The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area

Metrolinx completed a Regional Transportation Plan for the GGH in 2008 entitled *The Big Move: Transforming Transportation in the Greater Toronto and Hamilton Area.* This study states that the future vision for transportation in the Region includes:

- A high quality of life. Our communities will support healthy and active lifestyles, with many options for getting around quickly, reliably, conveniently, comfortably and safely (Metrolinx 2008a).
- A thriving, sustainable and protected environment. Our transportation system will have a low carbon footprint, conserve resources, and contribute to a legacy of a healthy and clean environment for future generations (Metrolinx 2008a).
- A strong, prosperous and competitive economy. Our region will be competitive with the world's strongest regions. Businesses will be supported by a transportation system that moves goods and delivers services quickly and efficiently (Metrolinx 2008a).

1.5.1.6 2041 Regional Transportation Plan

The 2041 Regional Transportation Plan (2041 RTP) for the GGH builds upon Metrolinx's 2008 transportation plan, 'The Big Move', and identifies the process through which governments and transit agencies will work to create an integrated, multi-modal regional transportation system that serves the need of residents, businesses and institutions (Metrolinx 2008b; Metrolinx 2018b). The 2041 RTP supports the Province of Ontario's Growth Plan. Five strategies with associated priority actions such as optimizing the transportation system, connecting more of the region with frequent rapid transit and integrating transportation and land use are included within the 2041 RTP.

A major focus of the 2041 RTP (included in Strategy 1 and 2) is to continue building and improving upon the GO Expansion Program initiated under 'The Big Move'. The GO Expansion Program seeks to transform GO from a commuter-focused service into a two-way all-day service (Metrolinx 2018a). To support the increased train service, the rail corridor expansion to Bowmanville and associated service improvements are being completed.

1.5.1.7 Durham Regional Official Plan 2020

The Durham Regional Official Plan (OP) establishes guidelines for growth and development, as well as current and future land use patterns in the Regional Municipality of Durham (e.g., Open Space, Employment Areas, and Transportation). The Durham Regional OP (2020a) provides policies to enhance the quality of life for present and future residents, establishes future development patterns through goals and implementation mechanisms, and provides information to Federal, Provincial and Municipal governments to consider in their respective plans and programs.

The Durham Regional OP (2020a) should support manageable growth that reinforces heritage of the Region and the natural environment while boosting the economy and providing job opportunities for its residents. The Durham Regional OP (2020a) states land should be developed efficiently while maintaining a distinction between urban and open spaces and/or agricultural areas to protect agricultural lands. The document also emphasizes the development of sustainable, healthy, and complete communities that encourage a livable urban environment for present and future residents.

The Durham Regional OP (2020a) states that development should create urban areas that are people-oriented and support active transportation throughout the region. The linkages within the region and between regions and/or adjacent areas should be improved through the implementation of a transportation system, which includes roads, transit, rail, harbour, and airport facilities. Additionally, the Durham Regional OP (2020a) provides guidelines to municipalities for area-specific intensification strategies stating that transportation hubs and commuter stations should be a key focus for intensification.

Regional corridors should be developed to promote public transit ridership to facilitate efficient links to urban centres and should have mixed uses in high density areas. The Durham Regional OP (2020a) establishes the Durham Transportation Master Plan should be adopted and maintained for policies, programs, and infrastructure improvements in the region.

1.5.1.8 Durham Transportation Master Plan 2017

The Durham Transportation Master Plan 2017 (TMP 2017) is a strategic planning document that builds on the principles set by the 2010 Long Term Transit Strategy, the 2012 Regional Cycling Plan, and the 2016 Transit Five Year Service Strategy. The Durham TMP 2017 provides support for development patterns outlined in the Durham Regional OP through policies, programs and infrastructure modifications required for growing transportation demands to the year 2030 and beyond. The overall objectives of the Durham Regional OP are to facilitate compact, mixed land use patterns and pedestrian-friendly design that will promote sustainable transportation modes. In doing so, transportation facilities can provide residents and businesses practical and efficient mobility options throughout Regional Municipality of Durham.

The focus of the Durham TMP 2017 is on all modes of transportation, including walking, cycling, public transit, autos, and movement of goods. The three guiding principles focus on healthy communities, economic prosperity, and environmental protection by focusing on users, connectivity, innovation, and collaboration and leadership. In addition, the Durham TMP 2017 defines seven strategic directions for the Plan, such as aligning strengthening bonds between land use and transportation, promote integrated public transit, make walking and cycling more practical, optimize road infrastructure, promote sustainable travel choices, improve goods movement, and strategically investing in the transportation system.

1.5.2 Municipal Plans and Policies

1.5.2.1 Clarington Official Plan (2018)

The Clarington OP (2018) guides future physical development of the municipality with regards to land use and transportation, while considering the implications on the economic, environmental, cultural, physical, and social well-being on the residents of Clarington. The Clarington OP (2018) states that this document should inform other municipal plans, public works, and actions and should provide a framework to prevent and resolve land use conflicts while identifying opportunities for development. There are three principles outlined in the Clarington OP (2018), including sustainable development, healthy communities, and growth management.

The Clarington OP (2018) states that the development of transportation in the municipality must provide a full range of mobility options for people and goods by developing a transportation system that connects community amenities and fosters economic activity. The Clarington OP (2018) states that priority should be placed on public transit, walking, and cycling through the use of existing transportation infrastructure and aims to improve upon existing transportation system to create more walkable, transit supportive centres and corridors. Transportation options to and within Employment Areas should focus on multi-modal transportation options.

The Clarington OP (2018) states that development should be concentrated on Urban and Village Centres to increase economic, social, and cultural activities throughout communities within the municipality. The Clarington OP (2018) outlines the development of two Transportation Hubs in Courtice and Bowmanville, which should be high density, mixed-use areas to support transit expansion to Clarington. The development of Urban and Village Centres, Waterfront Places, Neighbourhood Centres, and the Transportation hubs should be conducted with a focus on civic squares, parks, walkways, and built forms and characteristics that align with the community.

Since the Clarington OP was developed, Bill 23, *More Homes Built Faster Act* was approved. Specifically related to transit stations, this new Act requires municipalities to update their OPs and zoning by-laws to protect major transit stations areas. As noted above, the Clarington OP designates two Transportation Hubs aligning with two of Metrolinx's proposed GO stations (refer to Section 2.1.2). If needed, Clarington may need to amend their OP to align with the requirements of Bill 23.

1.5.2.2 Oshawa Official Plan (1987)

The Oshawa OP is a set of policies and land use designations aimed to guide the development pattern of the City of Oshawa. The Oshawa OP (2022a) was adopted by Durham Regional Council on November 20, 1985 and approved by the Minister of Municipal Affairs on February 12, 1987 with modifications. Subsequent amendments to the Official Plan approved/modified by the Regional Municipality of Durham and the Local Planning Appeal Tribunal were last consolidated in August 2022. The current consolidated Oshawa Official Plan (2022a) was reviewed for information relevant to this Project.

The Oshawa OP (2022a) states that land use should be focused on Central Areas, with the primary concentrations of well-designed, compact, and intensive urban development taking place within these central locations. The main Central Area is designed around Simcoe Street and King Street, which encompasses the Downtown Oshawa Urban Growth Centre and the Central Oshawa Transportation Hub. The Oshawa OP states that there should be a balance of employment and residential growth within the Central

Area, including a variety of shops, businesses, community resources, cultural resources, recreational uses, and transportation facilities, as well as mixed high density residential housing types.

The Oshawa OP (2022a) outlines a focus on high density, mixed-use, pedestrian-oriented, transit-supportive development through the implementation of corridors within urban areas. These corridors support walking, cycling, and transit routes and reinforces the linkages between major urban areas by using key arterial roads throughout the City.

The Oshawa OP (2022a) supports efficient multi-modal transportation through development that complements and optimizes the lands surrounding transit services. Transportation hubs should support high density working, living, shopping and/or leisure activities in high connectivity areas and should provide increased accessibility, comfort, convenience, and safety for pedestrian traffic.

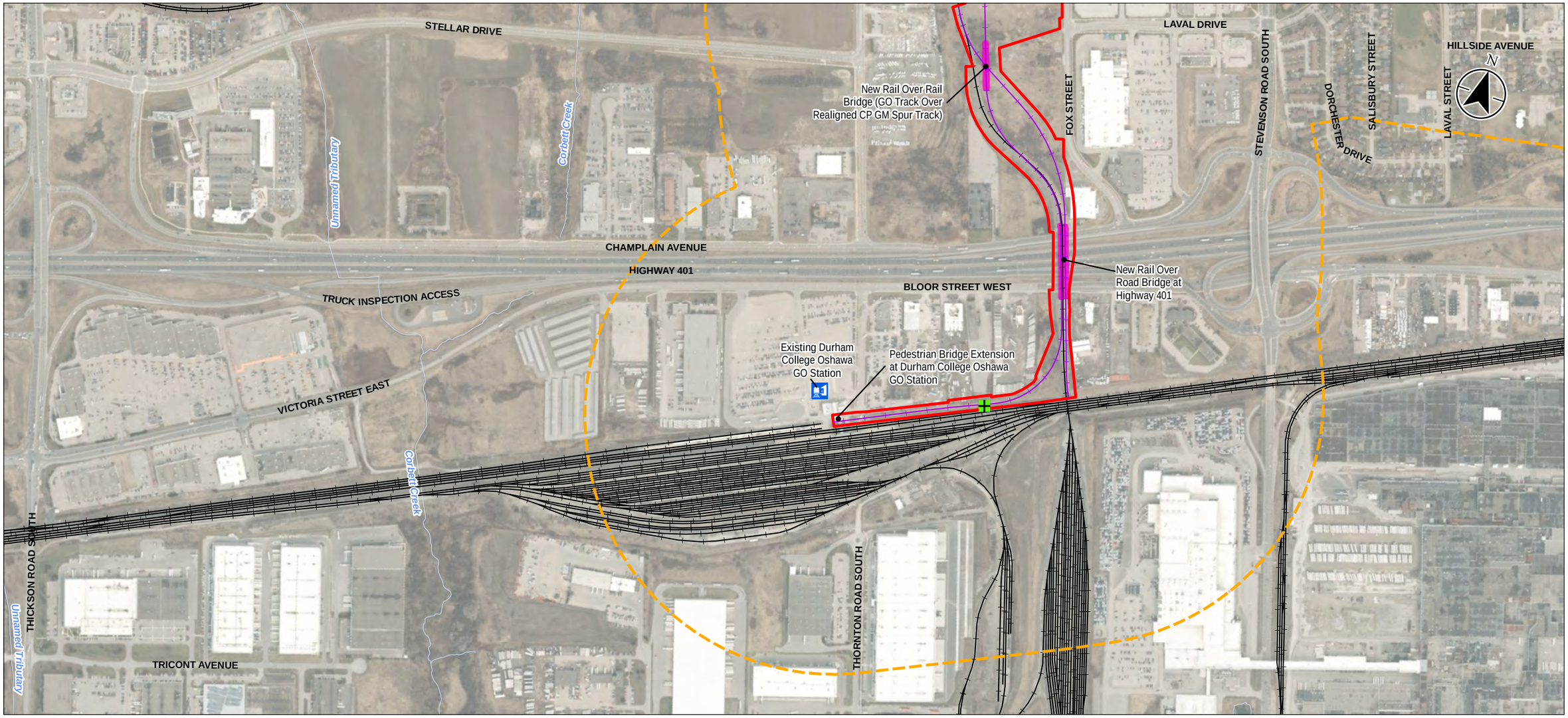
Since the Oshawa OP was developed, Bill 23, *More Homes Built Faster Act* was approved. Specifically related to transit stations, this new Act requires municipalities to update their OPs and zoning by-laws to protect major transit stations areas. As noted above, the Oshawa OP designates the Central Oshawa Transportation Hub which aligns with the location of the Front Street (B2 Ritson) GO station (refer to Section 2.1.2); there is no provision for the Fox Street (B1 Thornton's Corners East) GO Station in the OP. If needed, Oshawa may need to amend their OP to align with the requirements of Bill 23.

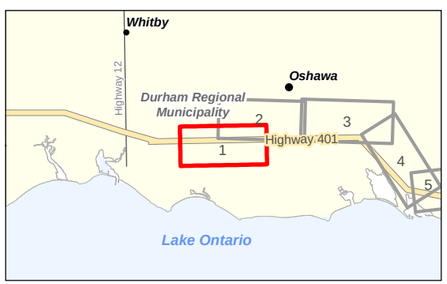
2.0 Update to the Project Description

The Project includes the proposed addition of new tracks, four proposed GO stations, bridges, at-grade crossing widenings, and modifications to structures and utilities in order to facilitate the Project. All Project components are described within this section, however as identified above in Section 1.3.2 only those components identified as “Significant” and “Not Significant” are carried forward for further assessment.

Key Project components and other design details are illustrated conceptually in Figure 2.1. Further details are provided in subsequent sections. Conceptual level design drawings are provided in Appendix C and referenced throughout Section 2.1.

The conceptual design shown in this EPR Addendum considered in-design mitigation measures to reduce or eliminate environmental effects, and to improve environmental features or functions where possible, based on the recommendations of supporting studies. The Project details provided herein are considered conceptual and are subject to refinement as planning progresses. Measures and dimensions are approximate and may vary as they are refined during the detailed design process.





Legend

- Project Footprint
- Study Area
- Bridge Structure
- Proposed Culvert Replacement
- Existing Durham College Oshawa GO Station
- Existing Railway
- Proposed Tracks
- Watercourse
- Waterbody

Notes

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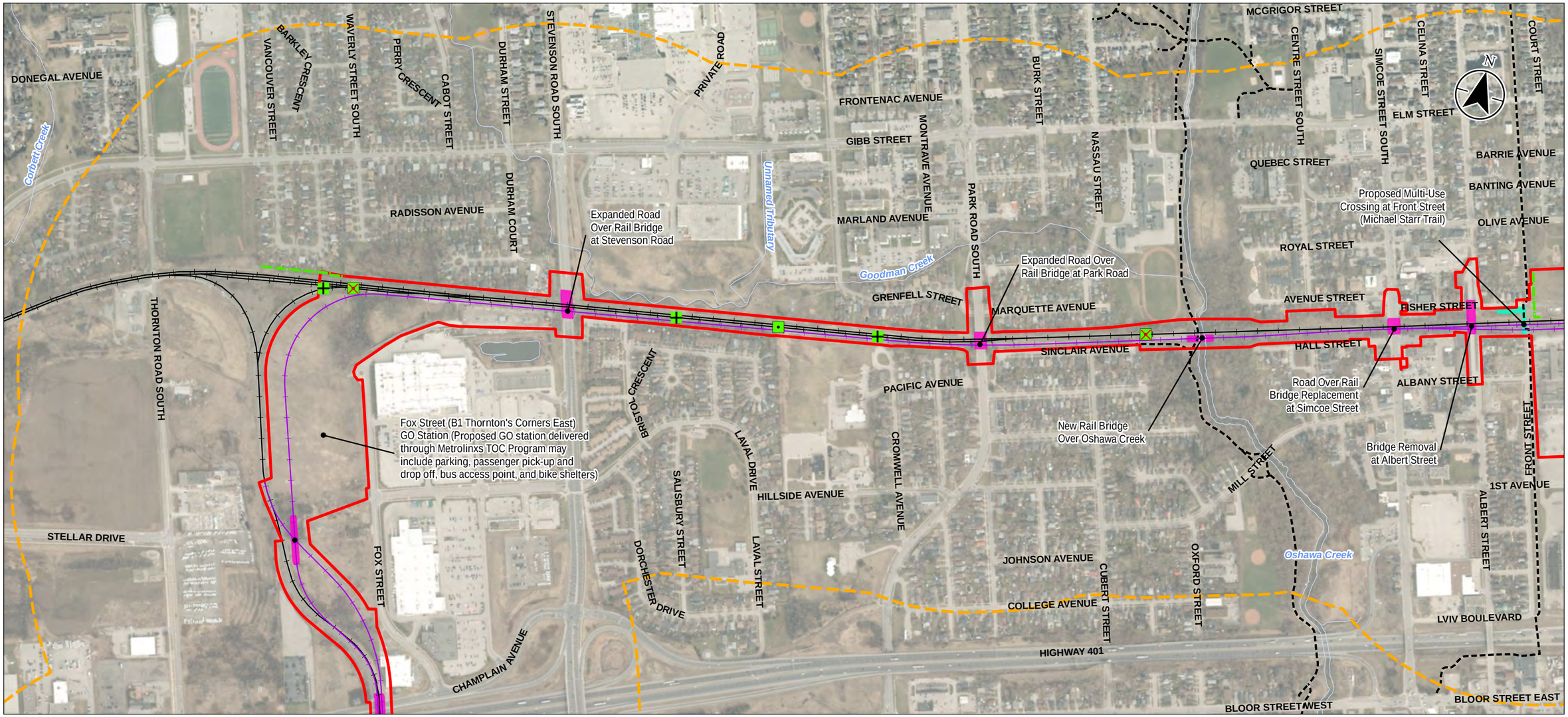
Project Location
Regioan Municipality of Durham

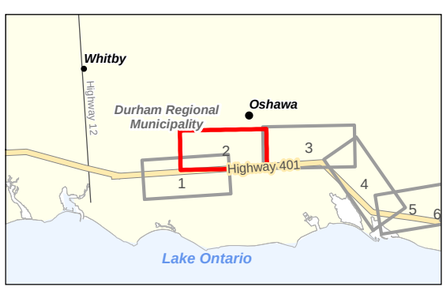
165011019 REVA
Prepared by BCC on 2023-08-22
Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
2.1.1

Title
Key Project Components





Legend

- Project Footprint
- Study Area
- Multi-Use Crossing
- Bridge Structure
- Proposed Culvert Modification
- Proposed Culvert Replacement
- Proposed Culvert Removal
- Existing Railway
- Proposed Tracks
- Recommended Noise Wall
- Trail
- Watercourse
- Waterbody

Notes

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Project Location
Regioan Municipality of Durham

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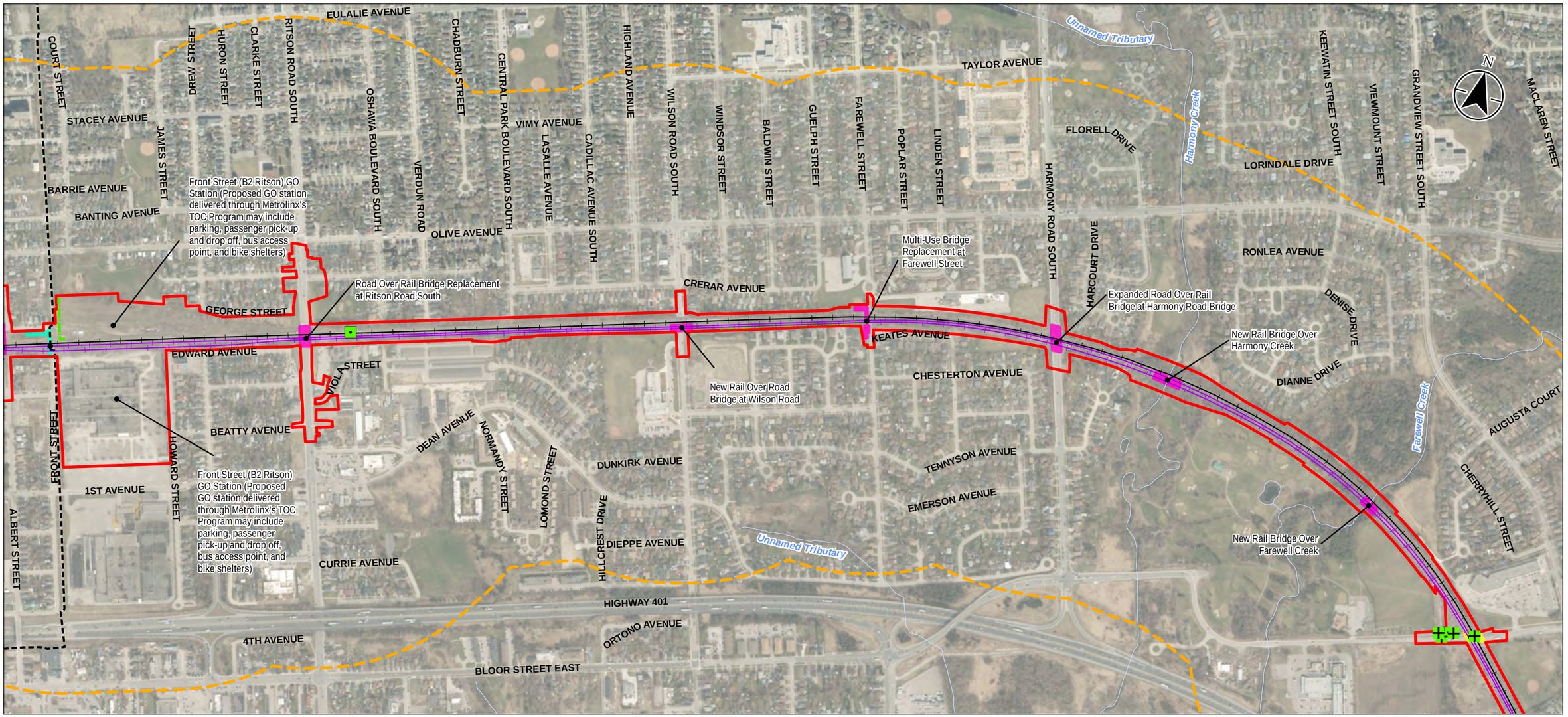
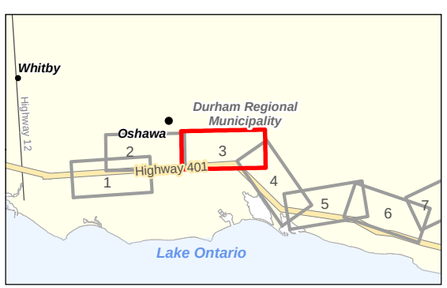
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
2.1.2

Title
Key Project Components





Legend

- Project Footprint
- Study Area
- Multi-Use Crossing
- Level Crossing
- Bridge Structure
- Proposed Culvert Modification
- Proposed Culvert Replacement
- Existing Railway
- Proposed Tracks
- Recommended Noise Wall
- Trail
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- Waterbody

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Project Location
Regioan Municipality of Durham

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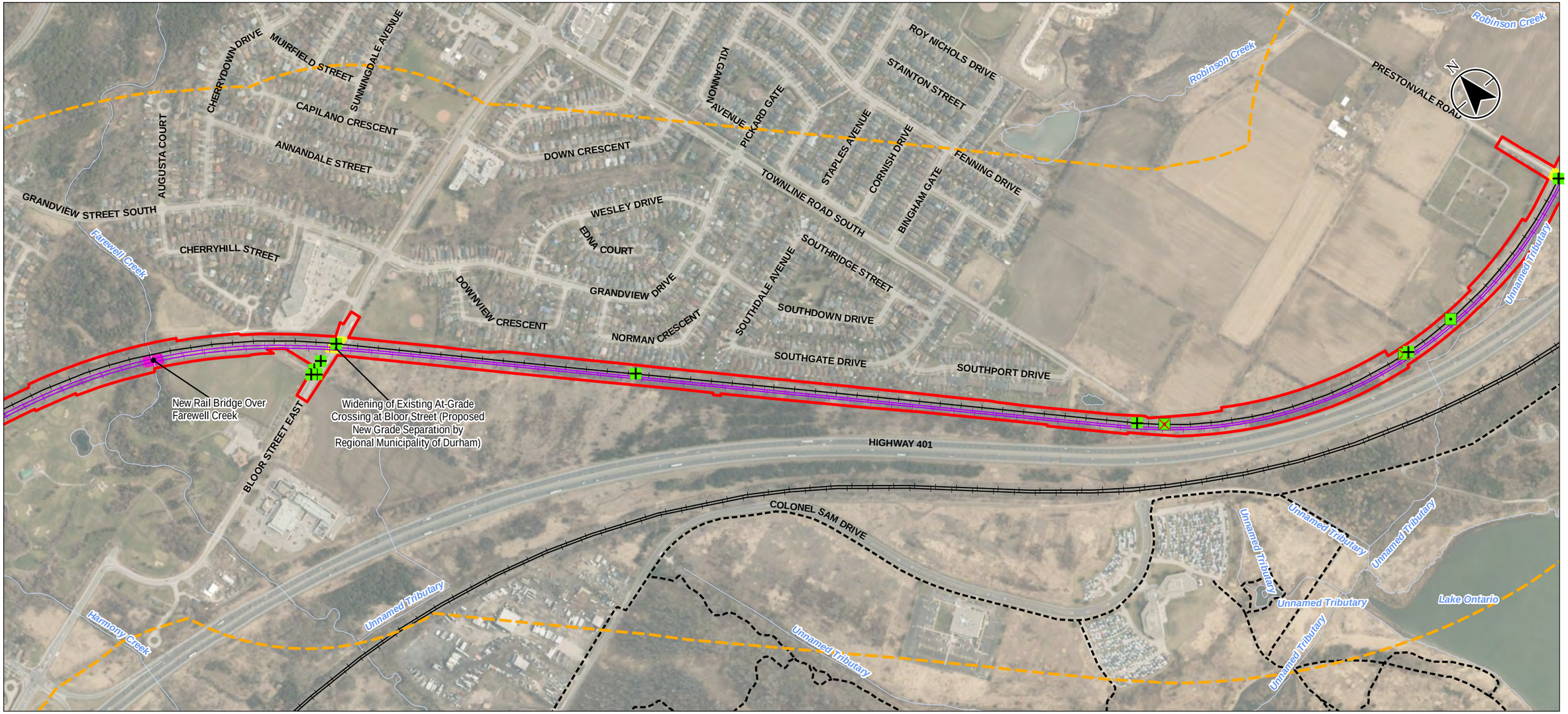
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
2.1.3

Title
Key Project Components



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Legend

- Project Footprint
- Study Area
- Level Crossing
- Bridge Structure
- Proposed Culvert Modification
- Proposed Culvert Replacement
- Proposed Culvert Removal
- Existing Railway
- Proposed Tracks
- Trail
- Watercourse
- Waterbody

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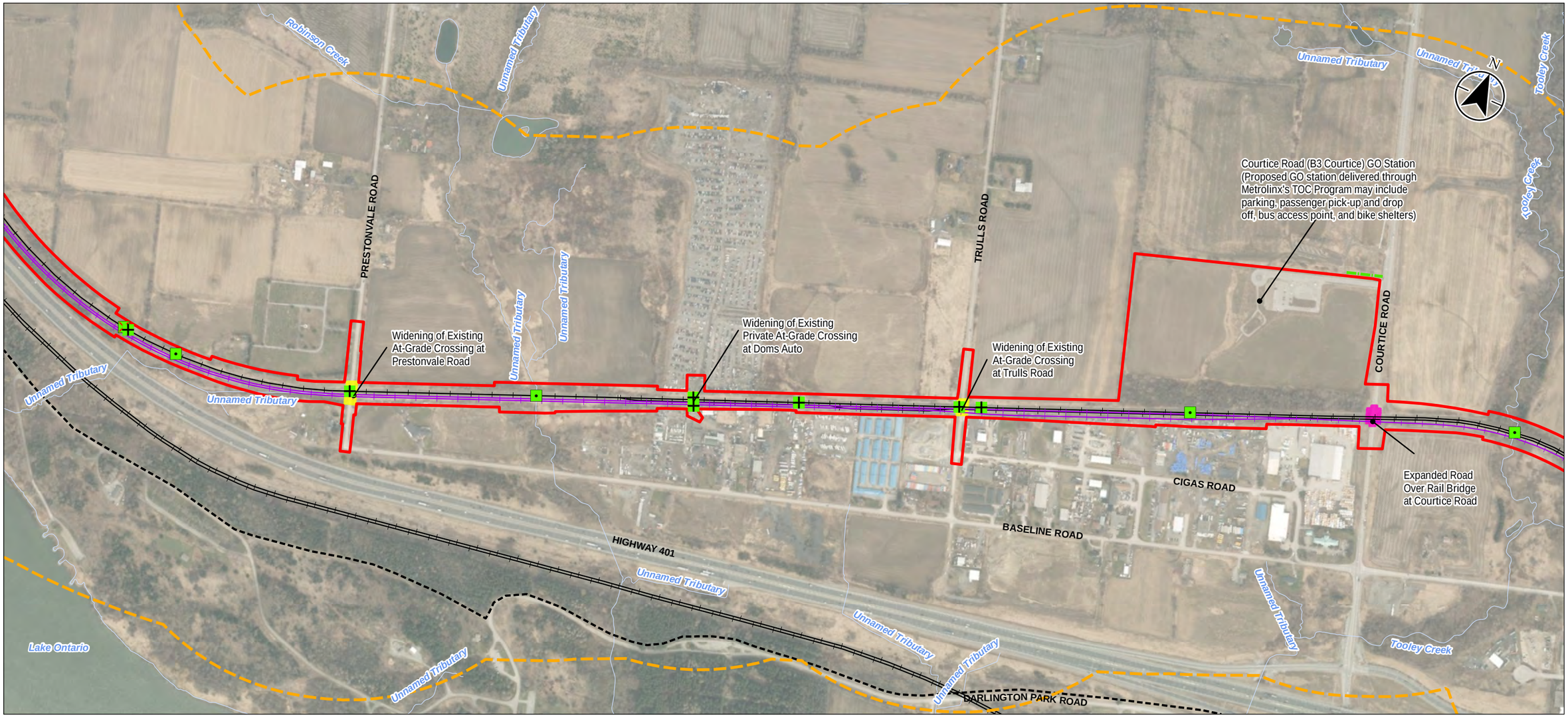
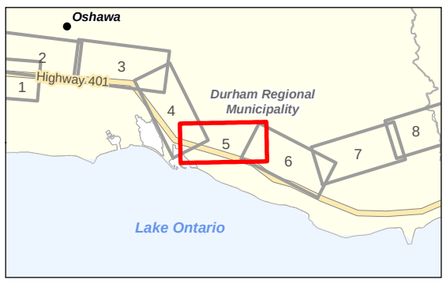
Project Location Regioan Municipality of Durham	165011019 REVA Prepared by BCC on 2023-08-22 Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
2.1.4

Title
Key Project Components





Legend

- Project Footprint
- Study Area
- Level Crossing
- Bridge Structure
- Proposed Culvert Modification
- Proposed Culvert Replacement
- Proposed Culvert Removal
- Existing Railway
- Proposed Tracks
- Recommended Noise Wall
- Trail
- Watercourse
- Waterbody

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Project Location
Regioan Municipality of Durham

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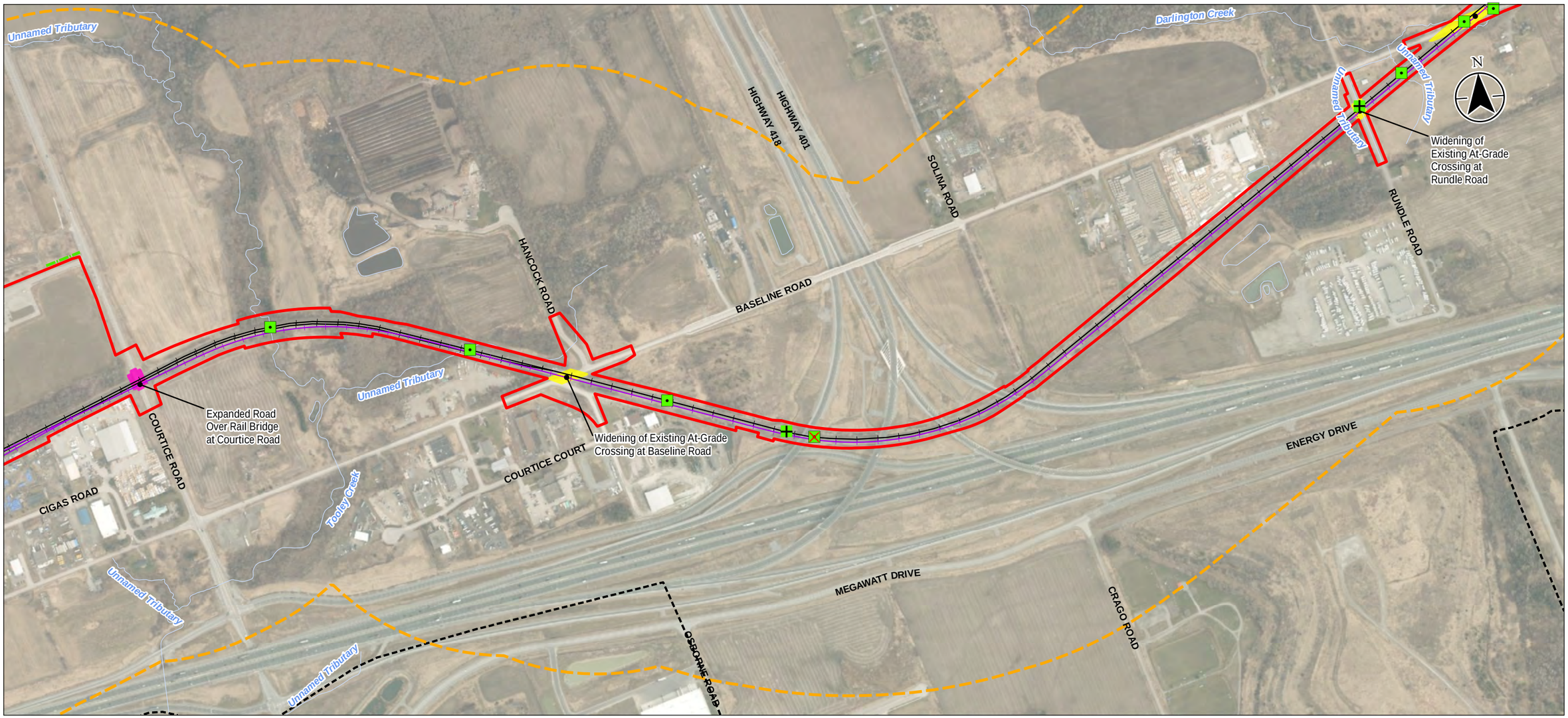
Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
2.1.5

Title
Key Project Components



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Legend

- Project Footprint
- Study Area
- Level Crossing
- Bridge Structure
- Proposed Culvert Modification
- Proposed Culvert Replacement
- Proposed Culvert Removal
- Existing Railway
- Proposed Tracks
- Recommended Noise Wall
- Trail
- Watercourse
- Waterbody

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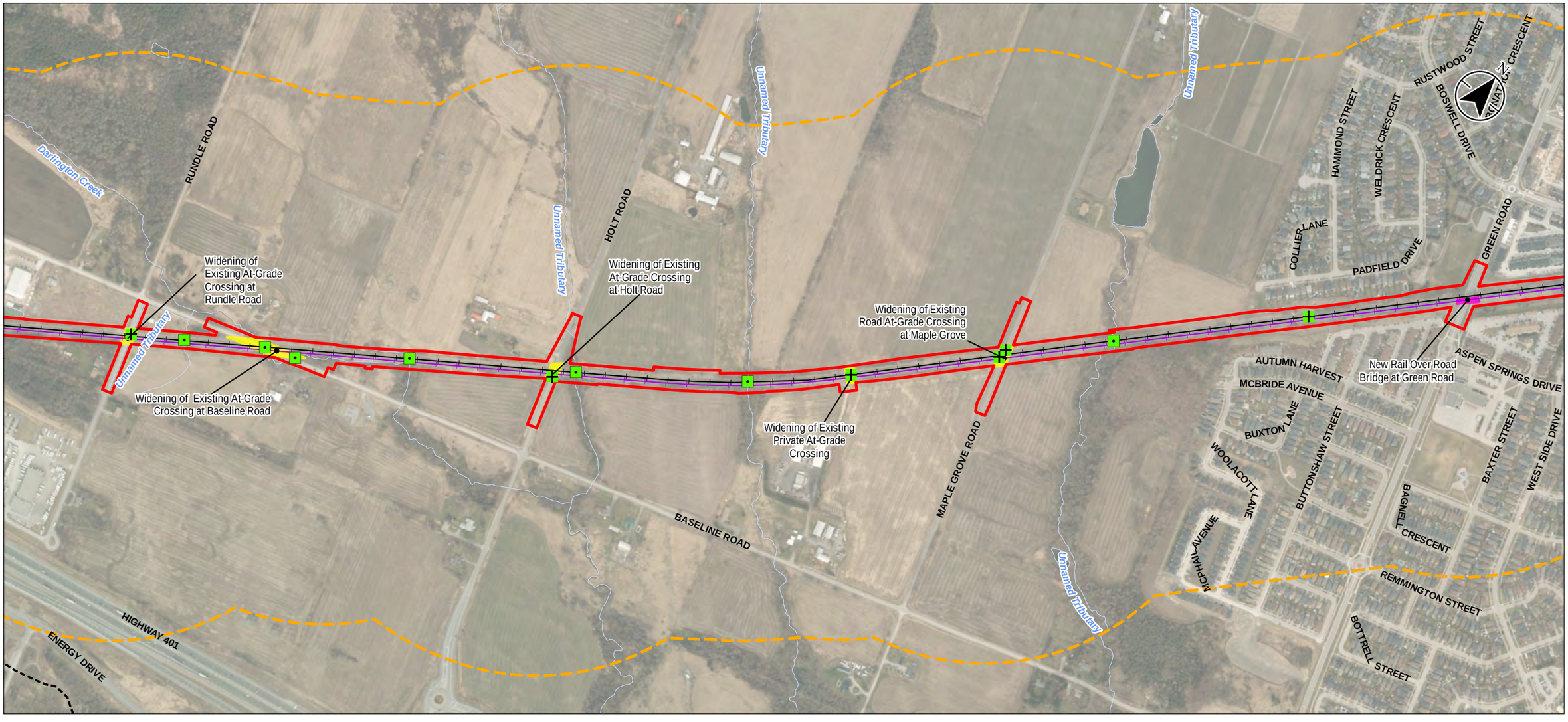
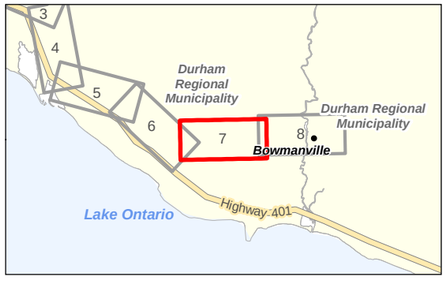
Project Location	165011019 REVA
Regioan Municipality of Durham	Prepared by BCC on 2023-08-22
	Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
2.1.6

Title
Key Project Components





Legend

- Project Footprint
- Study Area
- Level Crossing
- Bridge Structure
- Proposed Culvert Modification
- Proposed Culvert Replacement
- Existing Railway
- Proposed Tracks
- Trail
- Watercourse
- Waterbody

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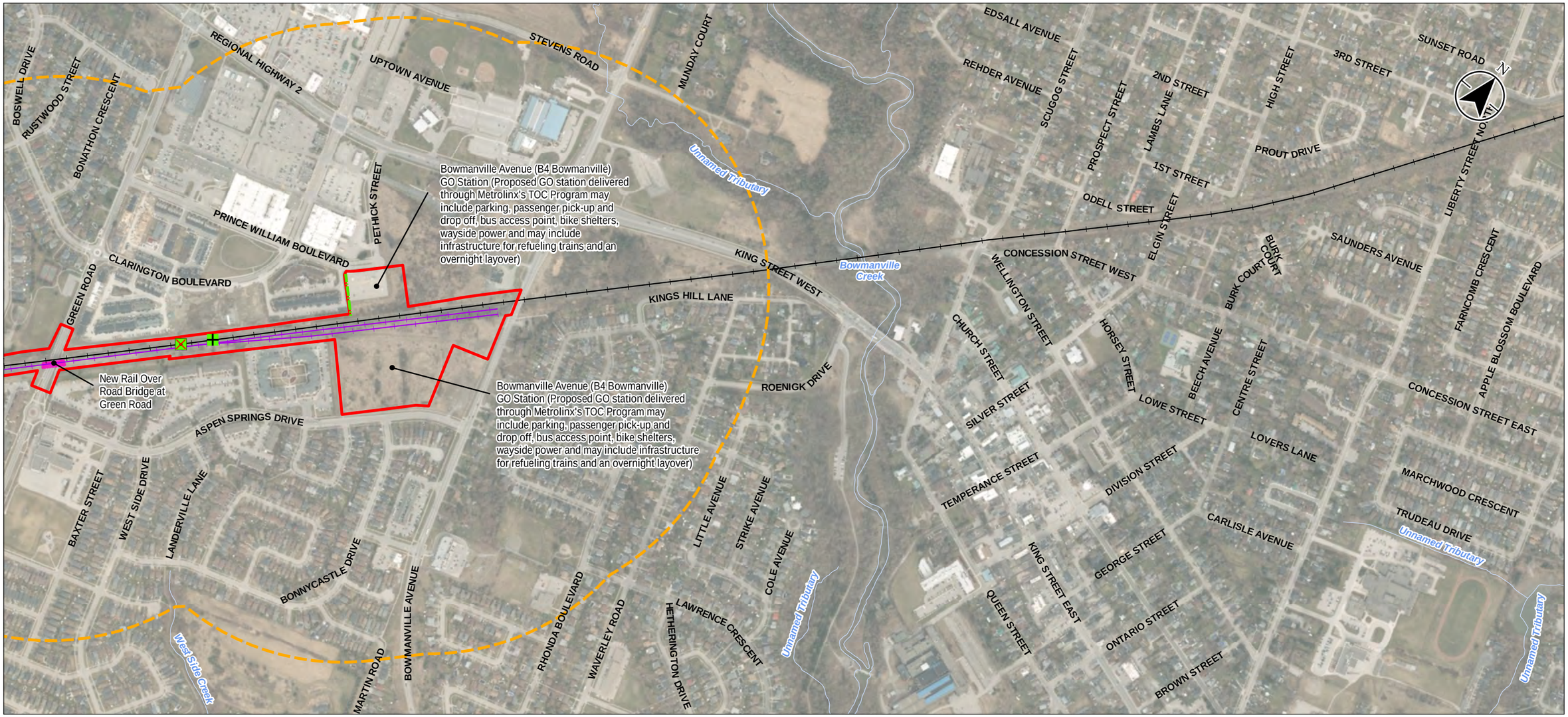
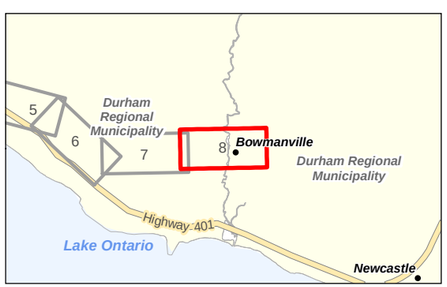
Regioan Municipality of Durham	Prepared by BCC on 2023-08-22
	Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
2.1.7

Title
Key Project Components





Legend

- Project Footprint
- Study Area
- Bridge Structure
- Proposed Culvert Replacement
- Proposed Culvert Removal
- Existing Railway
- Proposed Tracks
- Recommended Noise Wall
- Watercourse
- Waterbody

Notes

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Project Location
Regioan Municipality of Durham

165011019 REVA
Prepared by BCC on 2023-08-22
Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
2.1.8

Title
Key Project Components

2.1 Key Project Components

2.1.1 Linear Facilities

2.1.1.1 Trackwork

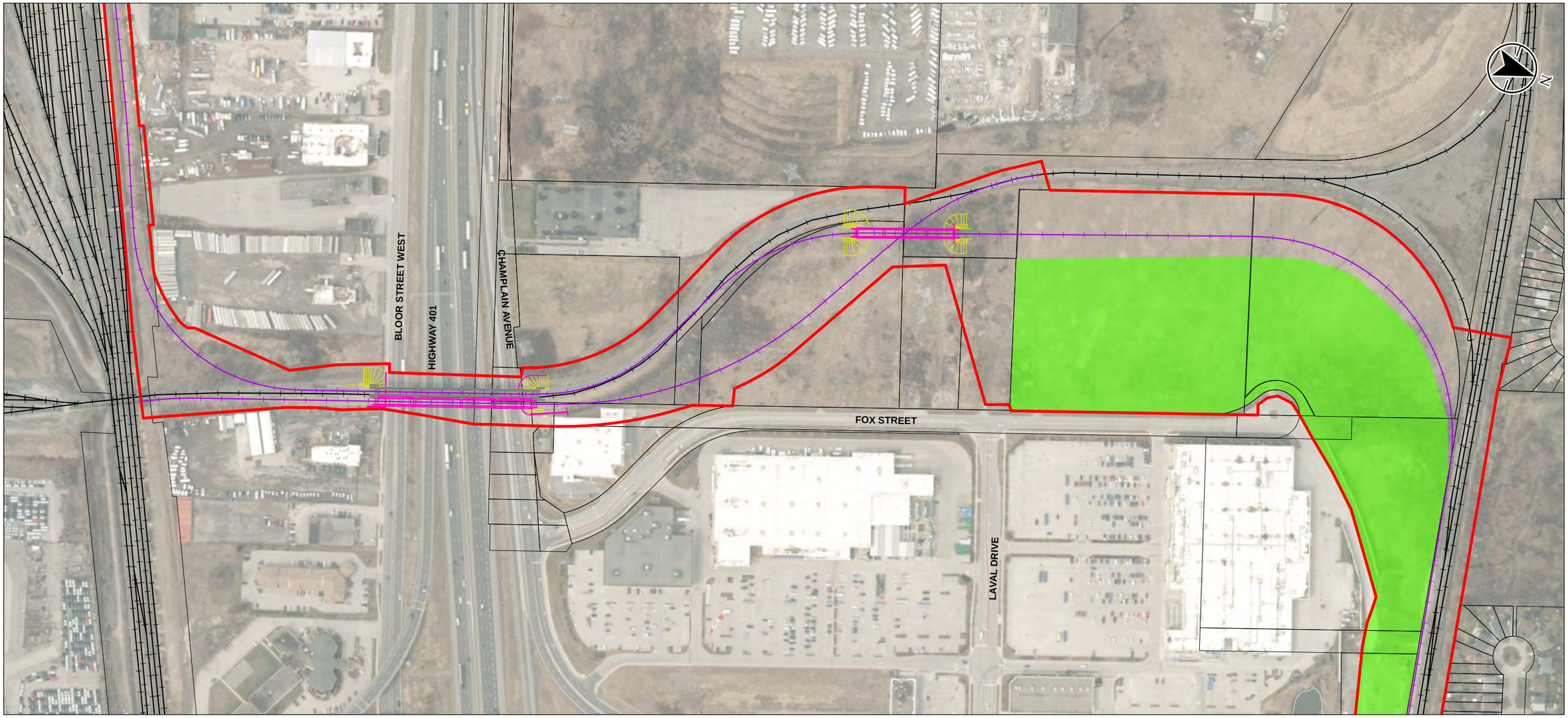
In the 2011 EPR, the CP Rail tracks were proposed to be shifted to the north in some sections to allow for the addition of two new GO tracks to the south. In the current design, the mainline will not move, with new passenger tracks aligned south of the southernmost existing CP Rail track centerline. A description of the currently proposed trackwork is provided below.

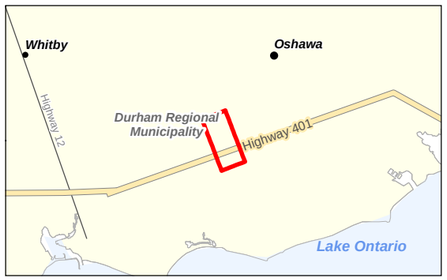
Trackwork will be required within the existing GO Lakeshore East Rail Corridor at the western limit of the Study Area and within the CP Belleville Subdivision throughout the Study Area. Figure 2.1 shows the extent of the proposed trackwork. One GO track will be constructed east of the DC Oshawa GO, within the Lakeshore East Rail Corridor, crossing Highway 401 and extending north to the existing CP Rail corridor (refer to Figure 2.1.1). The CP Rail corridor currently has two CP Rail tracks from the western point where the GO track will join with the CP Rail corridor (refer to Figure 2.1.2), extending to Park Road where the two CP Rail tracks transition into a single track throughout the remainder of the Study Area (Figures 2.1.2 to 2.1.8). The new GO track will continue within the CP Belleville Subdivision until Bowmanville Avenue, Municipality of Clarington (Figure 2.1.8).

Commencing east of Simcoe Street in the City of Oshawa (Figure 2.1.2), a second GO track will be constructed for a distance of approximately 8.3 km, ending to the west of Courtice Road, Municipality of Clarington (Figure 2.1.5). At this point, the two tracks will return to a single track until east of Green Road, Municipality of Clarington, where the GO tracks will again be doubled and extend until Bowmanville Avenue (Figures 2.1.5 to 2.18). For all work within the CP Belleville Subdivision, the new GO trackwork will be located to the south of the existing CP Rail track.

The 2011 EPR proposed creating a connection from the GO Lakeshore East Rail Corridor to the CP Rail corridor through Corbett Creek which is now proposed to be located at the GM Spur. The GM Spur track will be realigned to the east of its existing location, crossing Highway 401 on a new bridge (refer to Section 2.1.3). North of Highway 401, the GM Spur track will cross beneath the proposed GO track and connect with the existing GM Spur track. These changes are shown on Figure 2.2.

Grading and drainage construction, material removal and importation, and signal installation and testing, will be required to complete the trackwork. Property acquisitions will be required in some locations and will be confirmed as design progresses.





Legend

- Project Footprint
- Existing Railway
- Existing Bridge
- Waterbody
- Property Boundary
- Study Area
- Proposed Tracks
- Bridges/Crossings
- Grading
- Proposed GO Station Location

Notes

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Project Location
Regioan Municipality of Durham

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Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
2.2

Title
GM Spur Trackwork and Associated Bridges

2.1.1.2 Ancillary Structural Work

Ancillary structures were discussed at a summary level in the 2011 EPR. Ancillary structures such as retaining walls, grading and drainage modifications, culvert extensions, and load crossings will be required to facilitate the Project. Other upgrades such as electric, communication and mechanicals systems will be required.

Retaining walls are required to provide track protection and to accommodate variations in grading along the length of the corridor. Retaining wall locations will be refined based on the alignment design and may be required on the north and/or south side of the rail corridor as necessary to facilitate the Project. Metrolinx will determine the appropriate finish(es) for the retaining walls based on municipal planning and urban design policies and objectives, surrounding land uses, adjacent built form, and pedestrian, cycle and automobile traffic levels. At a minimum, exterior wall facings that are visible to the public will receive a permanent concrete facing and a plain finish.

2.1.1.3 Utilities

There are a number of utilities located within the proximity to the Project (Table 2.1) and the Project may result in conflicts with existing utilities, similar to those described in the 2011 EPR. Recommendations to address these conflicts will be confirmed as the Project progresses into subsequent phases.

Table 2.1: Utilities in the Study Area

Utility Type	Owners
Watermains, Culverts, Sanitary Sewers and Storm Sewers	Regional Municipality of Durham, City of Oshawa, Municipality of Clarington, Canadian Pacific Railway, and private ownership
Pipelines and Gas	Enbridge Gas Inc.
Hydro, Railway Lighting, and Street Lighting	Hydro One Networks Inc. (HONI), Oshawa Public Utilities Company, Canadian Pacific Railway, and Canadian National Railway Company
Communications	Rogers Communications Canada, Zayo Canada, and Bell Canada

2.1.2 GO Stations

Four new GO stations are being planned as part of the Project (refer to Table 2.2 for locations). Three of the four GO stations are proposed in the same locations as in the 2011 EPR, the exception being Fox Street (B1 Thornton's Corners East) which is now proposed to the east of the location indicated in the 2011 EPR.

As noted in Section 1.2.3, the proposed GO stations will be delivered through Metrolinx's TOC Program where third parties will fund the design and construction of new GO station infrastructure for Metrolinx to own and operate. The TOC Program allows for unique GO stations to be integrated with higher density, mixed use development with funding from private partners. This type of development is designed to increase transit ridership and reduce traffic congestion, increase housing supply and jobs with access to transit, create complete communities based on good planning principles and provide positive value capture for the Province to maximize transit investment while reducing taxpayer burden. The rigorous requirements that back all Metrolinx infrastructure projects will be met for service and design of the GO stations in accordance with Metrolinx's standards and requirements.

GO station locations will be accessible, integrated with surrounding land uses to facilitate transit access with residential and commercial use, and provide convenient use for all passengers. The GO stations will provide a connection for passengers transferring from adjacent bus routes and associated stops.

The new GO stations will include typical station infrastructure, which may include parking, passenger pick-up and drop off (PPUDO), a bus access point and loop facility, bike shelters and pedestrian access infrastructure. The Bowmanville GO Station may include facilities to allow for parking trains overnight while not in service and will include wayside power infrastructure and may include protective measures for fueling considerations; these facilities were not contemplated in the 2011 EPR. The final outcome and configuration of the proposed GO stations is subject to delivery by third parties through Metrolinx's TOC Program and is to be confirmed as the design process progresses in accordance with Metrolinx's standards and requirements.

For the purpose of this assessment, impacts were focused on how the GO station operation may affect adjacent properties and environmental features within the footprint of the GO station properties. The assessment was meant to conceptually confirm potential impacts of the GO stations and identify whether effective approaches are available through either avoidance or mitigation at an acceptable level. The EPR Addendum is not meant to confirm a final or detailed design approach for the GO stations. Further details on new stations and transit-related infrastructure will be confirmed as the design progresses under the established planning and Environmental Assessment process. Preliminary details are presented in the table below (Table 2.2).

Table 2.2: GO Station Location Summary

GO Station Name	Location
Fox Street (B1 Thornton's Corners East)	The proposed Thornton's Corners East GO Station is located south of the CP Rail corridor, east of Thornton Road South and north of Highway 401.
Front Street (B2 Ritson)	The proposed Ritson GO Station is close to the center of Oshawa. The GO station will be bounded south of Olive Avenue, east by Albert Street, west of Ritson Road and north of First Street. A new multi-use crossing will be constructed to provide access to the Michael Starr Trail and Front Street (refer to Section 2.1.3).
Courtice Road (B3 Courtice)	The existing Courtice GO Station bus terminal will be redeveloped into the new Courtice GO Station with train service and expanded facilities. This GO station is between the main downtown areas of Oshawa and Bowmanville at the northwest quadrant of the Courtice Road and CP Rail intersection, with direct access to Highway 401.
Bowmanville Avenue (B4 Bowmanville)	The existing Bowmanville GO bus terminal located at Highway 2 and Bowmanville Avenue will be redeveloped into the new Bowmanville GO Station with train service and expanded facilities.

2.1.3 Bridges

The trackwork identified in Section 2.1.1.1, will require modifications or construction of bridges at several locations along the alignment. Table 2.3 summarizes the proposed bridge modifications. Bridge modifications on CP Rail's Belleville Subdivision will occur to the south of existing bridge structures.

Rail bridges will accommodate one or two tracks (depending on location) in addition to the existing CP Rail tracks. Design and type will be confirmed as design progresses, however Table 2.3 presents the bridge type identified in preliminary design work. The bridge design will address standard maintenance issues. As required and in accordance with applicable standards, lighting will be placed to improve visibility for traffic, pedestrians and cyclists. Artificial lighting will be incorporated as per applicable lighting standards.

Reconstructed / replaced overpasses are required at two locations (i.e., Simcoe Street, Ritson Road) and the existing pedestrian bridge at Farewell Street will be replaced with a multi-use bridge. Sidewalks will be provided on both sides of the road overpasses. The road overpasses and the multi-use bridge will be designed to municipal and *Accessibility for Ontarians with Disabilities Act* (AODA) standards. Bridge removal and road closure at the rail corridor is proposed at Albert Street.

Expansion of the existing bridges at five locations (i.e., DC Oshawa GO (pedestrian bridge), Stevenson Road, Park Road, Harmony Road, and Courtice Road) is also required. Existing road-over-rail bridges expanded southward to accommodate proposed GO tracks will be maintained at existing elevations and grades.

Seven new bridges are proposed including at Highway 401, the GM Spur, Oshawa Creek, Wilson Road, Harmony Creek, Farewell Creek and Green Road. Conceptual renderings of the proposed Highway 401 and Simcoe Street bridges are provided in Appendix D.

Multi-use (i.e., pedestrian and/or cycling) ramps and crossings will be designed to a minimum width of 3 m. The design of the multi-use crossings will be further refined during detailed design, taking into consideration the potential effects identified in this EPR Addendum. The crossings will be compliant with the AODA and will meet municipal standards, at a minimum. Design will address standard maintenance issues.

Modifications to the design of the GM Spur and connecting track may be required during future design phases in order to accommodate the Regional Municipality of Durham's proposed extension of Stellar Drive, which will provide an east-west connection between the existing Laval Drive and Stellar Drive. Metrolinx infrastructure is expected to remain within the Project Footprint.

Conceptual design drawings have been prepared for the majority of the proposed bridge modifications. References to the conceptual design drawings are included in Table 2.3, where available. The design shown is meant to illustrate the potential design approach at these locations, is considered to be preliminary and is subject to change as design progresses. Dimensional measurements are approximate and likewise subject to change.

Table 2.3: Proposed Bridge Modifications within the Study Area

Location	Description	Proposed Specifications	Change from the 2011 EPR	Appendix C Drawing Reference Number
DC Oshawa GO	Pedestrian bridge extension to access the VIA platform	Enclosed bridge over the new GO track, similar to the existing, with elevators and stairs	New infrastructure	Not Available
Highway 401	New bridge to be located to the east of the existing bridge.	Accommodates one new rail track	New infrastructure	EPRA-PP-01

Location	Description	Proposed Specifications	Change from the 2011 EPR	Appendix C Drawing Reference Number
GM Spur	The new GO Track will pass over the realigned GM Spur track	Accommodates one new rail track	New infrastructure	Not Available
Stevenson Road Bridge	Widen road overpass and replacement of existing south abutment to accommodate 1 new GO Track	Overpass will accommodate existing four lanes of traffic. One new track to pass beneath	No substantial change	EPRA-PP-02
Park Road Bridge	Widen road overpass and replacement of existing south abutment to accommodate 1 new GO Track	Overpass will accommodate existing four lanes of traffic. One new track to pass beneath	No substantial change	EPRA-PP-03
Oshawa Creek Bridge	New bridge on separate alignment south of the existing bridge to carry 1 new GO Track	Accommodates one new rail track	No substantial change	EPRA-PP-04
Simcoe Street Bridge	Remove existing structure and reconstruct road overpass	Overpass will accommodate existing four lanes of traffic. One new track to pass beneath	Structural work now proposed	EPRA-PP-05
Albert Street Bridge	Bridge removal and road closure	Closure of Albert Street at the rail corridor with barricades at the terminus of Albert Street, both north and south of the rail corridor	Structural work now proposed	Not Available

Location	Description	Proposed Specifications	Change from the 2011 EPR	Appendix C Drawing Reference Number
Front Street Multi-Use Crossing (Michael Starr Trail)	New non-vehicular grade separation	Accommodates two new tracks	New infrastructure	EPRA-PP-06
Ritson Road Bridge	Remove existing structure and reconstruct road overpass	Overpass will accommodate existing four lanes of traffic. Two new tracks to pass beneath	Structural work now proposed	EPRA-PP-07
Wilson Road Bridge	New bridge on separate alignment south of the existing bridge to carry 2 new GO Tracks	Accommodates two new rail tracks	Structural work now proposed	EPRA-PP-08
Farewell Street Multi-Use Bridge	Replace non-vehicular multi-use crossing (bridge)	Accommodates two new tracks	No substantial change	EPRA-PP-09
Harmony Road Bridge	Widen road over pass and replacement of existing south abutment to accommodate 2 new GO Tracks	Overpass will accommodate existing four lanes of traffic. Two new tracks to pass beneath	Structural work now proposed	EPRA-PP-10
Harmony Creek Bridge	New bridge on separate alignment south of the existing bridge to carry 2 new GO Tracks	Accommodates two new tracks	Single track to the north of existing bridge	EPRA-PP-11
Farewell Creek Bridge	New bridge on separate alignment south of the existing bridge to carry 2 new GO Tracks	Accommodates two new tracks	Single track to south of existing bridge	EPRA-PP-12
Courtice Road Bridge	Widen road overpass and replacement of existing south	Overpass will accommodate existing two lanes of traffic. One new	Structural work now proposed	EPRA-PP-13

Location	Description	Proposed Specifications	Change from the 2011 EPR	Appendix C Drawing Reference Number
	abutment to accommodate 1 new GO Track	track to pass beneath		
Green Road Bridge	New bridge on separate alignment south of the existing bridge to carry 1 new GO Track	Accommodates one new track	Structural work now proposed	EPRA-PP-15

2.1.4 At-Grade Crossing Widenings

Modifications to at-grade crossings will also be required to accommodate the additional tracks and were not explicitly identified in the 2011 EPR. Existing at-grade crossings at the following locations will be widened:

- Prestonvale Road
- Trulls Road
- Bloor Street[13]
- Private Crossing for Dom's Auto
- Baseline Road (at two locations)
- Rundle Road
- Holt Road
- Private Crossing west of Maple Grove Road
- Maple Grove Road

As part of the widening, roadways will be reprofiled and warning system and signage for the crossings will need to be modified to accommodate future configurations. Prestonvale Road, Maple Grove Road and the two private crossings currently do not have crossing protection (i.e., gates); new gates will be installed at these locations.

A conceptual design for the at-grade crossing at Holt Road has been developed and is available in Appendix C (refer to drawing number EPRA-PP-14). The Holt Road location is considered to be representative of the other at-grade crossings, although grading, placement of signals and signal bungalows, the extent of road work and ditching will be site-specific. The design shown is considered to be preliminary and is subject to change as design progresses. Dimensional measurements are approximate and likewise subject to change.

[13] The Regional Municipality of Durham completed an Environmental Study Report under the Municipal Class Environmental Assessment process in 2022 for the realignment and widening of Bloor Street, including a new grade separation (i.e., road over rail crossing) at Bloor Street. Metrolinx has and will continue to coordinate with the Regional Municipality of Durham during detailed design for the proposed work at Bloor Street.

2.1.5 Temporary Areas of Disturbance

Several construction laydown and staging areas have been proposed for the Project, including laydown areas near or at each of the four proposed GO station locations. Final sites required for laydown and staging will be confirmed during detailed design.

Other areas may be temporarily disturbed to facilitate construction activities, including but not limited to areas required for construction of bridges and at-grade crossing widenings.

2.2 Construction

Construction of the rail bridges will occur over several stages. Abutments and piers are built first, including pile foundations. The spans and deck are then constructed, followed by road surface, track, and track drainage.

Reconstructed road overpasses (i.e., Simcoe Street, Ritson Road) will require the demolition of the existing bridge prior to the construction of the new, longer span bridge. At Albert Street, the existing bridge will be demolished, and the road closed in accordance with municipal requirements.

Modification of existing road overpasses (i.e., Stevenson Road, Park Road, Harmony Road, and Courtice Road) involves demolition of the existing south bridge abutment and construction of a new abutment along with associated retaining walls, if required based on site specific conditions.

Construction of a new or replacement multi-use bridge will commence with the footings and piers for the bridge and the ramps. The bridge superstructure, consisting of a prefabricated steel truss, will be placed onto the piers by crane. The concrete decking for both the bridge and the ramps would then be placed, followed by railings and joint systems. For a multi-use tunnel, a staged construction would likely be required under the tracks with the tunnel constructed in two stages with a track protection system (shoring) between the stages. Excess soil removal is required for the ramps and for tunneling beneath the rail corridor and retaining walls (final height dependent on design) would be required adjacent to the rail corridor.

At-grade crossing widening involves reconstruction of the road in the area of the crossing to accommodate the new track(s) and adjust the road profile. Crossing protection and signage is relocated and/or revised as required.

Track construction starts with earthworks to build the subgrade and drainage. The track is assembled on the subgrade, followed by ballasting and lifting to the final position.

Details regarding the construction of the GO stations and associated infrastructure are currently in development.

Affected utilities will be relocated and/or protected as required. The method for installing or re-instating utilities will be determined during future design phases and in coordination with the affected utility owners, as appropriate.

Road detours may be required to accommodate construction of bridges/overpasses and at-grade crossing widenings. Final construction sequencing will be determined during detailed design and is subject to change.

Activities associated with construction are described in Table 2.4. These activities have the potential to interact with the existing environment and are used to determine the potential environmental effects of the Project during construction (refer to Section 5.0). Mitigation measures and monitoring requirements are described in Section 5.10. Further refinements to the construction activities may be made as detailed design progresses.

Table 2.4: Anticipated Construction Activities

Activity	Description	Associated Equipment
Site Preparation	• Delivery of equipment and materials to the laydown area • Removal of vegetation, buildings and infrastructure • Installation of erosion and sediment control measures • Installation of temporary fencing	• Grading and grubbing equipment (if required) • Excavation equipment including backhoe, dump trucks, and soil removal equipment
Modifications to Utilities	• Removal and realignment of the utilities as required • Encasement where needed for protection	• Concrete pouring equipment • Excavation equipment including backhoe, dump trucks, soil removal equipment, jack hammers
Excavation and Grading	• Excavation of soils • Grading, sloping and contouring • Grading of areas associated with track detours • Progressive excavation for retaining walls	• Grading equipment • Excavation equipment including backhoe, dump trucks, and soil removal equipment

Activity	Description	Associated Equipment
Construction of Bridges / Overpasses	• Installation of temporary and permanent barriers for track and road safety • Excavation and pile driving • Construction of new bridge / overpass and trackwork • Construction of sidewalks • Reconstruction of road (for overpasses)	• Small cranes • Pile driving rigs • Excavators, Backhoes, Loaders, Dump trucks. • Concrete mixer trucks • Truck cranes. • Bulldozers, Compaction rollers, Road rollers • Road paving machines
Bridge removal at Albert Street	• Installation of permanent barriers for track and road safety • Removal of the existing overpass • Construction of road terminus segments	• Small cranes • Excavators, Backhoes, Loaders, Dump trucks. • Concrete mixer trucks • Bulldozers, Compaction rollers, Road rollers • Road paving machines
Construction of a Multi-Use Bridge Crossing	• Removal of the existing crossing • Installation of appropriate foundations and piers • Assembly and launching of the main bridge structure • Installation of ramps and associated retaining walls (if necessary)	• Pile driving rigs, cranes, concrete trucks • Excavator • Bulldozer
Construction of a Multi-Use Tunnel Crossing	• Removal of the existing crossing • Installation of retaining walls • Excavation (local areas with limited disturbance) • Installation of concrete caissons • Concrete work for tunnel construction	• Backhoes, loaders, dump trucks, concrete trucks • Augering machines for caisson construction, concrete mixer trucks • Bulldozer, compaction rollers • Concrete pouring equipment
Temporary Lane Closures/Detours	• Temporary lane closures, realignments and detours • Lane closures will follow standard traffic control management guidelines	• Temporary traffic control devices such as signs, signals, barriers, traffic barrels

Activity	Description	Associated Equipment
Construction of Retaining Walls	• Local excavations • Installation of soldier piles and caissons • Construction of cap beams and permanent struts where required • Temporary struts where required and excavation to final track levels • Installation of drive points and construction of facing between walls • Track work and drainage • Construction of exterior facing, drainage, and barriers (e.g., fencing)	• Backhoes, loaders, dump trucks • Cranes for soldier pile installation, augering machines for caisson construction, concrete mixer trucks • Bulldozer, compaction rollers
Laydown Areas	• Designation of areas to be used for laydown of materials and construction staging • As appropriate, use of gravel or other materials for the areas	• Grading and grubbing equipment (if required) • Excavation equipment including backhoe, dump trucks, and soil removal equipment • Generator for site trailers
Groundwater Dewatering	• The need for dewatering during construction activities will be confirmed during detailed design	• Groundwater pumping
Management of Stormwater	• During construction, stormwater management (SWM) will follow best management practices and align with applicable standards, municipal standards and requirements, and regulatory requirements • Surface flows will be discharged to municipal storm sewers • Installation of erosion and sediment control measures	• Grading equipment

2.3 Operations

Operational activities associated with the Project are listed in Table 2.5.

These activities have the potential to interact with the existing environment and are used to determine the potential environmental effects of the Project during operations (refer to Section 5.0). Mitigation measures and monitoring requirements are described in Section 5.10. Further refinements to the operations activities may be made as detailed design progresses and during operations.

Once modified (i.e., through relocation or encasement), the operations associated with utilities will revert back to the applicable owner and any potential effects associated with operations are not evaluated in this report.

Table 2.5: Anticipated Operations Activities

Activity	Description
General Operations	Maintenance of the: • rail bridges • multi-use crossings • retaining walls • drainage features (e.g., grading, culverts) • vegetation • snow clearing • debris/garbage clean-up • graffiti management and trespass control

3.0 Methodology

A series of environmental technical studies were undertaken as part of this Environmental Project Report (EPR) Addendum process to update existing conditions that were assessed as part of the 2011 EPR and to address the requirements of Ontario Regulation (O. Reg.) 231/08 Section 16. Section 16 requires a review of existing environmental conditions if construction of a transit project has not commenced within 10 years of the Statement of Completion submission (refer to Section 1.1 for further information).

The following subsections provide an overview of the methodologies used for each of the technical studies to confirm existing conditions and to undertake the effects assessment, including:

- Natural Environment
  - Aquatic Environment
  - Terrestrial Environment
  - Wildlife
  - Significant Wildlife Habitat
  - Species at Risk
  - Significant Natural Heritage Features
- Tree Inventory
- Geology and Groundwater
  - Landforms and Physiography
  - Soils and Bedrock Geology
  - Groundwater Resources
- Stormwater Management
- Air Quality
- Noise and Vibration

- Socio-Economic and Land Use
  - Planning Policy
  - Neighbourhood Profiles
  - Existing Land Use and Development Applications
  - Built Form and Visual Characteristics
  - Utilities
  - Source Water Protection
- Traffic and Transportation
  - Road Network
  - Transit Network
  - Cycling, Pedestrian and Trail Network
- Cultural Environment
  - Built Heritage Resources and Cultural Heritage Landscapes
  - Archaeology

A summary of existing conditions is provided in Sections 3.0 and 4.0, while the effects assessment, mitigation and monitoring are provided in Section 5.0.

3.1 Natural Environment

The Natural Environment Technical Report summarized the existing conditions with respect to the natural environment and evaluated potential impacts to natural heritage features and areas which may result from the construction and operations phases of the Project.

The Natural Environment Assessment Area is composed of the Project Footprint plus an additional 120 metre (m) buffer surrounding the rail alignment, bridges and crossings. A larger 500 m buffer was defined around the GO station centre points to allow for flexibility since design concepts for the stations will be confirmed as planning advances. The buffer accounts for the 120 m Adjacent Lands width as defined by the Provincial Policy Statement (PPS) and the Natural Heritage Reference Manual.

The Natural Environment Technical Report is provided in Appendix A1.

3.1.1 Existing Conditions

Background information was gathered and reviewed as part of the preliminary assessment process and prior to completing field investigations to inform targeted field surveys. The following subsections outline the methodology for completing the various components of the background review.

3.1.1.1 Site Documentation

Site documentation and technical studies were reviewed as relevant to the Natural Environment Assessment Area. This included reviews of the following documents:

- "Expansion of Rail Service from Oshawa to Bowmanville on the Lakeshore East Corridor: Natural Environmental Conditions Report" prepared by AECOM, dated September 30, 2010 (Project Number: 60115182).
- "Addendum to Oshawa to Bowmanville Rail Service Extension Environmental Project Report: Tree Inventory Technical Report" (Appendix A2).

Throughout the development of the Natural Environment Technical Report (NETR), information has been provided by Indigenous communities, including observations recorded during a site visit in June 2022. Information and species observations received from Indigenous communities has been incorporated into the NETR and EPR Addendum.

3.1.1.2 Policy Review

Given the geographic location of the Natural Environment Assessment Area, the following documents including associated maps and schedules were reviewed to determine the legislative and policy context of the Project as well as ascertain the presence and location of previously identified natural heritage features and areas within the Natural Environment Assessment Area:

- *Species at Risk Act* (2002) (SARA)
- *Fisheries Act* (1985)
- *Migratory Birds Convention Act* (1994) (MBCA)
- *Endangered Species Act* (2007) (ESA 2007)
- *Environmental Assessment Act* (1990)
- *Conservation Authorities Act* (1990) (CAA)

- Provincial Policy Statement (2020)
- A Place to Grow – Growth Plan for the Greater Golden Horseshoe (Office Consolidation 2020) (MMAH 2020a)
- Greenbelt Plan (2017)
- Official Plan of the Regional Municipality of Durham (2020) (Regional Municipality of Durham 2020a)
- City of Oshawa Official Plan (2021) (City of Oshawa 2021a)
- Municipality of Clarington Official Plan (2018)
- Central Lake Ontario Conservation Authority (CLOCA) policies and regulations (CLOCA 2014)
- CLOCA Wildlife Corridor Protection and Enhancement Plan (2022)

3.1.1.3 Geo-mapping and Database Reviews

Additional sources of information such as soil geology and physiography mapping, wildlife atlas data, watercourse and natural resource mapping were also reviewed prior to commencing field investigations.

These databases and information sources for the background review included the following:

- Natural heritage and physical feature layers from the Land Information Ontario (LIO) database which includes Ministry of Natural Resources and Forestry (MNRF) resource information (LIO 2021)
- The Natural Heritage Information Centre (NHIC) Biodiversity Explorer database, including Provincially Tracked Species Layer (NHIC 2021)
- MNRF's LIO Digital mapping of Aquatic resource area line segment (MNRF 2021a) and, if applicable, the corresponding Fisheries and Oceans Canada (DFO) drain classification
- DFO's online mapping tool of aquatic SAR (DFO 2021)
- CLOCA technical reports including applicable watershed plans databases and geo-cortex mapping resources
- Species at Risk in Ontario (SARO) provincial range maps (Ministry of the Environment, Conservation and Parks [MECP] 2021a)

- Atlas of the Breeding Birds of Ontario (Cadman et al. 2007)
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019)
- eBird Canada Database review for eBird Hotspots within the Natural Environment Assessment Area (eBird Canada 2021)
- Insect / Butterfly Atlas (Toronto Entomologist Association 2021)
- Mammalian observation database for Regional Municipality of Durham (iNaturalist 2021)
- High Resolution aerial photography of the Project Footprint and Natural Environment Assessment Area (Google Earth Pro 2021; LIO 2021)

The results of these searches were used to guide field investigations and to identify potential SAR and species of conservation concern (SOCC), aquatic habitats and other natural features and areas that have the potential to overlap with the Natural Environment Assessment Area. With exception of some hotspots (e.g., eBird), many of the wildlife record database resources generally do not provide the exact locations of a species occurrence record; accuracy generally ranges from 1 km² (e.g., NHIC) to 10 km² for most wildlife atlases. Some databases (e.g., iNaturalist) contain records that span larger areas such as municipal boundaries. As such, the results of the range map and atlas reviews are used to support the SAR and SOCC habitat screening assessments and to help scope the field program and identify areas that can then be targeted for additional field surveys.

3.1.1.4 Field Investigations

Upon completion of the background review, a gap analysis was completed to inform the field program by targeting areas where information was not previously collected, or where additional information was required to inform the impact assessment.

The field program was carried out in spring and summer 2021 and included surveys for the terrestrial environment, wildlife, and aquatic environment. Further field investigations were completed in 2022 to accommodate a modification to the Project Footprint at the Courtice Road (B3 Courtice) GO Station to incorporate the entire Metrolinx owned property parcel. In 2023, additional field investigations to accommodate modifications to the Project Footprint as well as to complete target surveys for SAR and aquatic habitats were undertaken. Field Investigations completed for the Project are listed in Table 3.1 and summarized below.

Table 3.1: Natural Environment Field Investigation Summary

Type of Field Work		Date(s) of Field Work
Aquatic Environment Surveys	Fish Habitat Assessment	June 3 and July 12 to 16, 2021
	Headwater drainage feature (HDF) Surveys	July 16, 2021; April 12 and May 24, 2022; April 20, 2023
	Fish Community Surveys and HDF Surveys	May 17, 18, 24, 25, July 10, 11, 12 and 14, 2023
Terrestrial Environment Surveys	Ecological Land Classification (ELC) and Botanical Inventory	May 27 and 31, June 1 and 3, 2021; June 13, 2022
	Butternut Health Assessments (BHAs)	August 17, 2021
Wildlife Surveys	Breeding Bird Surveys	May 27 and June 3, 14, 16, 17, 28, 29, and 30, 2021; June 13, 2022
	Amphibian Call Surveys	May 31 and June 1, 3, 15, 16 and 18, 2021
	Bat Acoustic Surveys (monitor deployments and retrievals)	June 18 to August 10, 2021; June 5 to 20, 2023
	Bat Exit Surveys (handheld units)	June 25 and July 19, 2021; June 5, 19, 26 and 28, July 10 and 12, 2023
	Wildlife Habitat Assessments	During all field visits
	Incidental Wildlife Observations	During all field visits

Motion sensor wildlife movement cameras were deployed at Tooley Creek crossing to record and assess wildlife movement in the area. The camera data will be analyzed following the survey period ending in May 2024 and will be reported under separate cover at that time.

Headwater Drainage Feature Surveys

HDFs were surveyed using the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (Toronto Region Conservation Authority [TRCA] and Credit Valley Conservation [CVC] 2014). Seven watercourses were surveyed in accordance with the HDF Guidelines by Stantec in 2021, 2022 and 2023 these are:

- Unnamed Tributaries of Lake Ontario (WC-5a and WC-5b)
- Unnamed Tributary of Tooley Creek (WC-7)
- Unnamed Tributary of Tooley Creek (WC-9)
- Unnamed Tributary of Darlington Creek (WC-10)
- Unnamed Tributary of Darlington Creek (WC-12)
- Unnamed Tributary of Darlington Creek (WC-13)
- Unnamed Tributary of Darlington Creek (WC-14)

All visits were completed within the windows specified by the HDF Guidelines. Weather conditions were monitored and taken into account for the timing of the field investigations. The first field investigation was completed shortly after the spring freshet. The second (late spring) and third (summer) field investigations were completed after at least 72 hours without precipitation in the catchments of the tributaries under investigation as per the recommendation in OSAP S4. M11.

Aquatic Habitat Surveys

Field investigations were completed for 14 locations where mapped watercourses intersected with the Natural Environment Assessment Area on June 3 and between July 12 and 16, 2021. Aquatic habitat observations were made of physical habitat characteristics using the methods described in the Ontario Stream Assessment Protocol (Stanfield 2017). The following aquatic habitat characteristics were described: stream velocity, bank stability, channel morphology, water quality, substrate, riparian vegetation/ land use, in-stream cover, stream dimension, and fish habitat potential. A photographic record was made of aquatic habitat conditions within the right-of-way (ROW) of the railway at the watercourse survey locations.

Fish Community Surveys

Fish collection records are available for most watercourses in the Natural Environment Assessment Area but not for some of the smaller unnamed tributaries. Fish community sampling was completed at nine locations in the Natural Environment Assessment Area that were without recent records (i.e., less than 10 years old). The nine locations fished in 2023 were:

- Farewell Creek (WC-4)
- Robinson Creek (WC-6)
- Tooley Creek (WC-8)
- Unnamed Tributary of Tooley Creek (WC-9)
- Unnamed Tributary of Darlington Creek (WC-10)
- Darlington Creek (WC-11)
- Unnamed Tributary of Darlington Creek (WC-12)
- Unnamed Tributary of Darlington Creek (WC-13)
- Unnamed Tributary of Darlington Creek (WC-14)

Fish community surveys were completed in May and July 2023. A single pass fish community survey was conducted in accordance with the methods described in the Ontario Stream Assessment Protocol (Stanfield 2017). Where possible two reaches of at least 50 m were surveyed for a total of at least 100 m of watercourse. At some locations access to lands adjacent to the CP Rail ROW was restricted by private property resulting in shorter sections of the watercourse being sampled. In addition, at some locations fishing was hindered by lack of or absence of water.

Terrestrial Environment Surveys

Vegetation community mapping for the Natural Environment Assessment Area was completed in general accordance with the ELC system for southern Ontario (Lee et al. 1998) standard procedures and protocols for lands within the Natural Environment Assessment Area and Project Footprint. Using previously collected data (AECOM 2010, CLOCA 2021b) as well as historical and current high resolution ortho imaging, vegetation communities were delineated on the most recent satellite imagery available for the Natural Environment Assessment Area. ELC units within the Project Footprint were subsequently verified in the field, subject to accessibility and safety. Where lands were not safe or accessible, assessments were completed from the existing rail-line ROW. Provincial significance of vegetation communities was based on the rankings assigned by the NHIC (MNRF 2023).

A list of vascular plant species observed in the Natural Environment Assessment Area was compiled. Identification of potentially sensitive native plant species was based on their assigned coefficient of conservatism (CC) value, as determined by Oldham et al. (1995). This CC value, ranging from 0 (low) to 10 (high), is based on a species' tolerance of disturbance and fidelity, or ability to thrive in a specific natural habitat. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters.

Butternut Health Assessments (BHA) were completed throughout the Natural Environment Assessment Area in accordance with provincial standards following the "Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the ESA" (Ministry of Natural Resources and Forestry [MNRF] 2021e) and completed by a certified BHA assessor during the leaf-on season.

Vegetation community data and general community characteristics were used to support the Significant Wildlife Habitat (SWH), SAR and Species of Conservation Concern (SOCC) Habitat Screening Assessments.

Thirty-seven (37) breeding bird point count stations were established along in the Natural Environment Assessment Area. Point count methods in the Natural Environment Assessment Area were completed in general accordance with Environment and Climate Change Canada's (ECCC) Breeding Bird Survey (ECCC 2018) and Ontario Breeding Bird Atlas (Federation of Ontario Naturalists 2001) standard procedures and protocols. Where potential SAR grassland bird habitat was identified (e.g., Bobolink or Eastern Meadowlark), a total of three rounds of surveys were completed in accordance with standard procedures and protocols (MNR 2013) to verify the presence or absence of these species within these areas.

Breeding Bird surveys were completed between a half an hour before sunrise and 10:00 a.m., to the extent possible. Weather condition parameters (e.g., precipitation and visibility) were within the acceptable range throughout the survey periods.

Twenty-five (25) amphibian monitoring stations were established to target potential amphibian habitat present within the Project Footprint or Natural Environment Assessment Area. The stations were surveyed in May and June in general accordance with the Marsh Monitoring Program (Bird Studies Canada 2009).

In 2021, bat acoustic surveys were conducted at 25 Bat Monitoring Stations (BMSs) in the Natural Environment Assessment Area using Wildlife Acoustics Song Meter SM4BAT detectors (ARU). In 2023, bat acoustic surveys were conducted at an additional four BMSs using ARU. The detectors were deployed in woodlands that overlap with the Project Footprint and/or woodlands located directly adjacent to the Project Footprint. Data was analyzed using Kaleidoscope Pro software by Wildlife Acoustics.

In 2021, visual bat maternity roost exit surveys were conducted at an abandoned warehouse south of the Canadian Pacific Rail (CP Rail) tracks between Front Street and Howard Street in Central Oshawa. In 2023, visual bat maternity roost exit surveys were conducted at buildings within the Project Footprint at the following addresses: 399 Simcoe Street South, 359 Ritson Road South and 464 Ritson Road South. The surveys followed the methodology outlined by MNRF (2018) for SAR bats roosting in buildings[14]. As in the bat acoustic surveys, the recordings collected by the acoustic monitoring equipment were screened using Kaleidoscope Pro software by Wildlife Acoustics.

Incidental wildlife observations were recorded and identified by sight, sound or distinctive signs during the field investigations.

Species at Risk

For the purposes of the assessment, SAR include species that are listed as Extirpated, Endangered or Threatened on the SAR in Ontario list as published under O. Reg. 230/08 and receive both individual and habitat protection under the ESA, 2007. Aquatic SAR also include those that are identified as Extirpated, Endangered or Threatened and are afforded protection under both the provincial ESA, 2007 and the federal SARA.

SAR and SOCC with recent occurrence records (i.e., within the last 20 years) or with overlapping habitat ranges within the Natural Environment Assessment Area, were considered in the assessment utilizing the data sources described in Section 3.1.1.3. Species with recorded observations of greater than 20 years old were considered historical in accordance with the standard Conservation Status Assessment Methodology (NatureServe 2019), which NHIC uses to evaluate a species' provincial or Subnational Rank (S-Rank). The potential for SAR and SOCC to occur within the Natural Environment Assessment Area was assessed by comparing species habitat requirements to the habitat conditions present on-site and using the results of the background information review and results from field investigations to apply rankings.

[14] Due to access restrictions, a visual exit survey was conducted at 359 Ritson Road South (BES3 and 4) during one evening only; a second evening survey was not conducted.

Significant Wildlife Habitat

The Natural Environment Assessment Area was assessed for the presence of candidate SWH features following the SWH Technical Guide (Ontario Ministry of Natural Resources (MNR) 2000) and in accordance with the evaluation criteria described in the SWH Criteria Schedules appropriate for the Natural Environment Assessment Area's Ecoregion.

The Natural Environment Assessment Area is located within Ecoregion 6E (Lake Erie-Lake Ontario). The SWH Criteria Schedules for Ecoregion 6E (MNRF 2015) contains information and criteria for identifying SWH. The MNRF generally categorizes SWH into the following five categories:

- Seasonal Wildlife Concentration Areas
- Rare Vegetation Communities
- Specialized Habitat for Wildlife
- Habitats of SOCC
- Animal Movement Corridors

Field data such as general habitat conditions and habitat characteristics were collected to inform the presence of SWH within the Natural Environment Assessment Area. Candidate SWH refers to potential habitats that meet the habitat criteria but have not been confirmed as significant through additional detailed studies.

3.1.2 Effects Assessment

Potential effects to existing natural heritage were assessed for both the construction and operations phases of the Project. The potential effects have been determined based on an understanding of the Project Footprint and Natural Environment Assessment Area and anticipated interactions with the existing natural environment during each Project phase. This was accomplished using Geographic Information System (GIS) techniques, which included an analysis of permanent versus temporary disturbance footprints and associated layering with existing natural heritage features, and a qualitative analysis of typical interactions between Project activities and the natural environment.

Within the Project Footprint, the methods for screening terrestrial species and their habitats ranged from species-specific surveys using standardized protocols for determining presence/absence, to delineation of potential habitat based on micro-site characteristics and/or associated species presence. This approach was also applied in the Natural Environment Assessment Area (i.e., land adjacent to the Project Footprint) where feasible, in combination with aerial photo interpretation and extrapolated field data used to assess portions of the Natural Environment Assessment Area. Using this approach, impacts to species could be assessed on a local scale, to features that may be directly affected by the Project, and on a landscape scale, to connecting features.

Where potential adverse impacts have been identified, environmental protection, mitigation and/or ecological restoration and subsequent monitoring activities are recommended to reduce these impacts. Mitigation and monitoring recommendations related to vegetation are based on Metrolinx's Vegetation Guideline (Metrolinx 2022).

3.2 Tree Inventory

The Tree Inventory Technical Report provided a detailed listing of trees within the Project Footprint and considered the potential effects resulting from construction and operations to trees within the Tree Inventory Assessment Area based on the proposed Project Footprint.

The Assessment Area included the Project Footprint plus any tree dripline that intersected with the plane of the area impacted.

The Tree Inventory Technical Report is included in Appendix A2.

3.2.1 Existing Conditions

The tree inventory was completed at various times between May 2021 and August 2023, based on site access permissions, survey logistics and Project timing for the properties within the Project Footprint.

Trees within the Project Footprint where access was available were inventoried and geolocated. The data collected for each tree includes tree species, general health condition, diameter at breast height (DBH) or diameter class, dripline radius, height, hazard probability and various other parameters were collected. The tree locations were recorded with a hand-held GPS unit.

The site was reviewed for threatened, rare or endangered trees. A 30 m buffer from the limit of construction was used to delineate the potential presence of threatened, rare or endangered trees.

3.2.2 Effects Assessment

A Tree Management Plan was prepared as part of the Tree Inventory Technical Report to identify the approximate existing tree locations, tree tag identification numbers, the adjusted dripline radius as well as the recommended action for each inventoried tree (i.e., remove or retain and protect) based on a review of the conceptual construction zones and the potential for direct or indirect impacts on adjacent trees.

The analysis of tree recommendations was conducted based on the Metrolinx Vegetation Guideline (2022) for non-electrified corridors. This document classifies zones based on offsets from the proposed track centreline and recommends vegetation density and height requirements in these zones. Zones 1 to 2 include the first 4.5 m in both directions from the proposed track centreline. Complete tree removals are recommended within this area. Zones 3 and 4 includes the first 9.0 m wide section of land beyond Zones 1 to 2. Tree removal is not required in Zones 3 and 4 so trees in these zones have been recommended for removal only when they were observed to be dead or potentially hazardous or interact with other Project components (e.g., retaining walls, grading, etc.).

3.3 Geology and Groundwater

The review of geology and groundwater included review of existing sources to determine geological and hydrogeological conditions present within the Study Area and potential effects resulting from construction and operations of the Project.

A Limited Phase I Environmental Site Assessment (ESA) was undertaken and provides a brief overview of geology within the Limited Phase I ESA Assessment Area. The Phase I ESA Assessment Area was defined as the Project Footprint plus a buffer of approximately 100 m on either side of the Project Footprint, with the exception of the GO station locations which were buffered by 250 m from the Project Footprint.

3.3.1 Existing Conditions

A desktop review was undertaken to confirm landforms, physiography, soils, bedrock geology, and groundwater resources within the Study Area. Key information sources included:

- Oshawa, Map 30 M/15, 1:50,000 – Canada Centre for Mapping, Natural Resources Canada; published in 1994 (1989 information)
- Quaternary Geology of Ontario, Southern Sheet; Ontario Geological Survey, Map 2556, 1991

- Ontario Geological Survey 1991. Bedrock Geology of Ontario, southern sheet; Ontario Geological Survey, Map 2544, Scale 1:1,000,000
- A series of geotechnical reports prepared by Golder Associates Ltd. to support the design of the Project
- MECP's well records (MECP 2023)

3.3.2 Effects Assessment

Impacts to geology and groundwater were assessed based on the extent of potential environmental interactions anticipated during construction and operations.

3.4 Stormwater Management

The review of existing stormwater conditions included identification of watersheds overlapped by the Project Footprint and existing Stormwater Management (SWM) ponds within the Natural Environment Assessment Area. Potential effects were identified based on the anticipated changes to stormwater drainage resulting from the proposed Project.

3.4.1 Existing Conditions

Watershed delineations were based on CLOCA technical reports including applicable watershed plans databases and geo-cortex mapping resources.

Existing SWM ponds within the Natural Environment Assessment Area were documented as part of the Natural Environment Technical Report through the ELC process. Refer to Section 3.1.1.4 for details regarding the ELC methodology.

The existing landscape and drainage systems along the rail corridor were identified and documented as part of the Stormwater Management and Drainage Design Report (Stantec 2023).

3.4.2 Effects Assessment

Impacts to stormwater were assessed based on the extent of potential environmental interactions anticipated during construction and operations. The effects assessment considers the potential for construction and operations to interact with existing SWM facilities and flood conditions, and included consideration of the feasibility of hydraulic design to be able to effectively mitigate the potential for negative impacts.

3.5 Air Quality

The Air Quality (AQ) Technical Report identified existing AQ within the AQ Assessment Area and assessed the potential impacts on AQ associated with the construction and operations of the Project. Applicable mitigation measures and monitoring activities were identified for any negative impacts to AQ as a result of the construction and operations activities.

An AQ Assessment Area was identified based on the Project Footprint and geographic limits within which the potential impact on AQ is assessed. A modelling area of 500 m radius from the boundary of the entire Project Footprint was used. Study areas were also identified for the footprints of the selected modelling assessment locations for each of the Project components.

The AQ Technical Report is provided in Appendix A3.

3.5.1 Existing Conditions

Existing conditions were established based on the following:

- Reviewing ambient monitoring data available from the National Air Pollution Surveillance Network (NAPS) or the MECP to establish baseline AQ levels.
- Identifying sensitive (residential) and critical (schools, hospitals, retirement homes, childcare centres, and similar institutional building) receptors (Ministry of Transportation [MTO] 2020) in the Air Quality Assessment Areas and the study area for each location.
- Reviewing baseline Greenhouse House Gas (GHG) emissions at the provincial and national level, as well as for the provincial and national transportation sector.

The background AQ concentrations were based on review and analyses of the most recent five years (2016-2020) of data currently available from the NAPS monitoring stations located closest to or most representative of the Project locations. Ambient monitoring data from the NAPS program provides accurate and long-term AQ data of a uniform standard across Canada.

The existing conditions for climatology for the AQ Assessment Area was based on 30-year (1981 to 2010) Canadian Climate Normal data obtained from ECCC for the Oshawa Water Pollution Control Plant (WPCP) and Toronto Buttonville Airport meteorological stations which are the closest stations to the AQ Assessment Area with complete climate normal data.

3.5.2 Effects Assessment

One modelling assessment location for each Project component type (i.e., trackwork, GO stations, bridges and at-grade crossing widenings) was selected for the detailed quantitative assessment (including air dispersion modelling) for the construction phase. Selection of Project component locations was based on a review of the available Project design, construction activity and duration, the expected construction equipment to be used, the expected Project Footprint and the receptor types and their proximities to the construction area. Representative assessment locations include:

- Trackwork: 300 m segment of track west of Farewell Street Multi-Use Crossing to west of Harmony Road Bridge
- GO Station Location: B4 Bowmanville
- Bridges: Simcoe Street
- At-grade Crossing Widenings: Rundle Road

For all modelling assessment locations, maximum activity levels during construction that correspond to maximum emissions scenarios were assumed.

Background concentrations are used in dispersion modelling to represent the cumulative effect of other emissions sources (i.e., both anthropogenic and biogenic) in addition to the sources being included in the dispersion modelling.

Air dispersion modelling was conducted using site specific parameters for each of the four Project components at representative worst-case locations for the construction phase, which entailed:

- Developing maximum construction and operations emissions scenarios based on available construction equipment and scheduling data, identification of laydown and staging areas, operations details, and road and rail line detours (if applicable).
- Quantifying construction emissions, using standard methods and references, including the U.S. Environmental Protection Agency (EPA) AP-42: Compilation of Air Emissions Factors (U.S. EPA 2006 and 2011), Western Regional Air Partnership Fugitive Dust Handbook (WRAP 2006), U.S. EPA Exhaust Emission Standards (U.S. EPA 2016; U.S. EPA, 2020a), train and auxiliary engine load factors provided by Metrolinx (Metrolinx 2021), and U.S. EPA's Motor Vehicle Emission Simulator (MOVES) 3 model (U.S. EPA 2020b).

- Dispersion modelling of each Project component location using the U.S. EPA AERMOD Version 19191 model to predict changes in AQ during construction. Impacts at identified special receptors and gridded receptors at specified spacings at each modelling location were assessed. Gridded receptors were placed at the following spacings from a rectangle bounding the main construction activities:
  - 10 m spacing within 50 m of the boundary of the entire proposed corridor
  - 25 m spacing from 50-200 m of the boundary
  - 50 m spacing from 200-500 m of the boundary
  - 75 m spacing from 500-700 m of the boundary
- 5-year (2016-2020) site-specific meteorological dataset processed by the MECP Air Modelling and Emissions Unity was used for the modeling.

For the operations phase, dispersion modeling of the entire proposed corridor and an emissions inventory for the baseline scenario, future build (with Project), and future no-build (without Project) scenario was developed for the AQ Assessment Area, including train operation along the proposed corridor between the DC Oshawa GO and Bowmanville GO Station, as well as operations related to the four proposed GO stations. The emission inventory quantified current and future operations, including GO station operation, train schedule, train speed and emissions data, train fleet distribution, traffic data (traffic count, vehicle distribution, speed / idling conditions), where applicable. Emission factors for road traffic were estimated with the U.S. EPA emission simulator MOVES and related emission factors. Train fleet / emissions data were estimated based on Metrolinx provided data. The U.S. EPA AERMOD Version 19191 dispersion model was used to predict changes in AQ due to operations phase emissions in each Sub-Project assessment area. A 5-year (2016-2020) site-specific meteorological dataset processed by the MECP Air Modelling and Emissions Unit was used for the modelling. Impacts at the identified sensitive / critical receptors as well as gridded receptors at specified spacings were assessed. For the operations phase air dispersion modelling, the following grid extension and spacing were used:

- a minimum 500 m distance from the Project Footprint which includes the entire proposed rail corridor (per MTO guidance)
- 20 m spacing within 200 m of the Project Footprint along the entire proposed rail corridor
- 50 m spacing from 200 - 500 m of the Project Footprint

An assessment of direct and indirect GHG emissions from the Project was also included for both the construction phase and operations phase. Project GHG emissions were compared with provincial, federal and sector GHG emissions totals and the federal GHG emissions reduction target.

Following the emission inventory and air dispersion modelling exercise, an effects assessment was undertaken comparing the predicted Project Alone concentrations for construction and operations at the sensitive or gridded receptors to applicable AQ criteria, standards, or Metrolinx thresholds. The predicted cumulative concentrations (Project plus background levels) for construction and operations were compared to applicable AQ criteria, standards, or Metrolinx thresholds. Project construction and operations emissions on an annual basis were also compared to provincial, federal and transportation sector GHG emissions totals and the net contribution of the Project towards Canada's GHG emissions reduction target was assessed.

Based on the results of the assessment, recommendations for mitigation measures to be implemented to manage and mitigate emissions associated with Project construction and operations at all locations and recommendations for ambient air monitoring (e.g., air contaminants to monitor, monitoring locations), if required, are outlined in the AQ Technical Report. Refer to Appendix A3 for the AQ Technical Report and further details.

3.6 Noise and Vibration

The Noise and Vibration Technical Report identified existing sources of noise and vibration within the Noise and Vibration Assessment Area. The report further assessed the potential impacts of noise and vibration generated by construction and operations at the sensitive receptors in the vicinity of the Project Footprint and identified applicable mitigation measures and monitoring activities for any negative impacts from noise and vibration as a result of the construction and operations activities.

The Noise and Vibration Assessment Area for the noise impact assessment was defined as per the Metrolinx Environmental Guide for Noise and Vibration Impact Assessment (Metrolinx 2019b) (Metrolinx Environmental Guide) which recommends a minimum study area for impact assessments of 300 m on either side of rail or roadway for rail projects and 500 m from construction sites or stationary sources (i.e., GO station locations) in all directions. For the purposes of this assessment, the Noise and Vibration Assessment Area has been defined as per the more conservative construction requirements of 500 m around the Project Footprint.

The Noise and Vibration Technical Report is provided in Appendix A4.

3.6.1 Existing Conditions

Baseline noise and vibration data was collected for the Project between May 3, 2021 and June 2, 2021. Baseline noise measurements were conducted at six representative locations (Figure 3.1) within the Noise and Vibration Assessment Area. The six locations were:

- Cromwell Avenue South of ROW, approximately 4 m above grade (NM01)
- Keates Avenue South of ROW, approximately 4 m above grade (NM02)
- Southport Road North of ROW, approximately 4 m above grade (NM03)
- Courtice Road North of ROW, approximately 4 m above grade (NM04)
- Holt Road adjacent to South of ROW, approximately 4 m above grade (NM05)
- Bowmanville Carpool Lot North of ROW, approximately 4 m above grade (NM06)

The sounds levels captured at these six locations were used to validate the noise model used for the Project. The predicted sound levels are conservative in comparison with measured sound levels at NM01, NM02, NM03, and NM06. These areas are critical as they are located within the city limits of Oshawa and Bowmanville and are extensively developed areas surrounded by residences. Predicted sound levels at NM04 are below measured levels; however, they are considered acceptable given externalities such as acceleration noise specific to the measurement locations as discussed above. Predicted sound levels at NM05 are considered to be in reasonable agreement with measured levels as they are within 1-2 dBA of measured sound levels. Based on these results, the Project noise model and the procedure followed for the assessment were considered appropriate for the purpose of determining Project sound levels. The noise model was used to predict pre-Project daytime and nighttime sound levels at the Points of Reception (POR) selected for the Project.

Annual Average Daily Traffic data and commercial vehicle percentages for significant roads in the area were reviewed to establish baseline sound levels. Speed limits used for the analysis were obtained from street view.

Baseline vibration measurements were conducted at two representative locations within the Noise and Vibration Assessment Area. The measurement locations were chosen based on the proposed track alignment and they were at the northwest corner of the Cromwell Avenue roundabout in Oshawa (VM1) and southwest corner of Green Park in Bowmanville (VM2). Based on the current CP Rail track alignment, the closest existing POR to the north of the corridor is approximately 20 m from the centerline and to the south is approximately 30 m from the centerline. Based on the setbacks with the current and future alignment, measurements were taken at 15 m, 20 m, 25 m, and 30 m from the centerline of the existing CP Rail track.

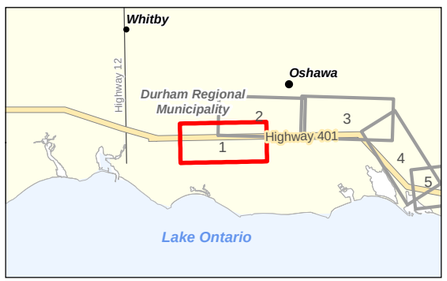
3.6.2 Effects Assessment

3.6.2.1 Points of Reception

The location (within the noise sensitive land parcel) where noise is assessed is defined as a POR. PORs were selected by reviewing land uses within the Noise and Vibration Assessment Area and comparing them to POR selection criteria defined by the Metrolinx Environmental Guide for rail operations and by the MECP NPC-300 for the GO station operations.

A total of 89 representative PORs, including future developments, were chosen within the Noise and Vibration Assessment Area for the assessment of noise impact from operations, including 84 PORs for the rail corridor assessment and nine additional PORs to evaluate stationary noise sources at GO stations and the layover facility. PORs are shown on Figure 3.1. The receptors were considered for daytime and nighttime assessment operations as per the guidelines. Thirty-one (31) PORs were chosen for the assessment of vibration impact from rail operations, where the potential for impacts from vibration were identified (a smaller zone of influence than for noise).

STELLAR DRIVE
LAVAL DRIVE
HILLSIDE AVENUE
FOX STREET
STEVENSON ROAD SOUTH
DORCHESTER DRIVE
SALISBURY STREET
LAVAL STREET
Unnamed Tributary
CHAMPLAIN AVENUE
HIGHWAY 401
BLOOR STREET WEST
TRUCK INSPECTION ACCESS
VICTORIA STREET EAST
Corbett Creek
THICKSON ROAD SOUTH
THORNTON ROAD SOUTH
TRICONT AVENUE
New Rail Over Rail Bridge (GO Track Over Realigned CP GM Spur Track)
New Rail Over Road Bridge at Highway 401
Existing Durham College Oshawa GO Station
Pedestrian Bridge Extension at Durham College Oshawa GO Station
N



Legend
- Project Footprint
- Existing Durham College Oshawa GO Station
- Existing Railway
- Proposed Tracks
- Bridge Structure
- Watercourse
- Waterbody

Notes
1. Coordinate System: NAD 1983 CSRS MTM 10
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
3. Orthoimagery © First Base Solutions, 2021. Imagery Date, 2019.

0 200 400 m

1:8,000 (At original document size of 11x17)

Stantec

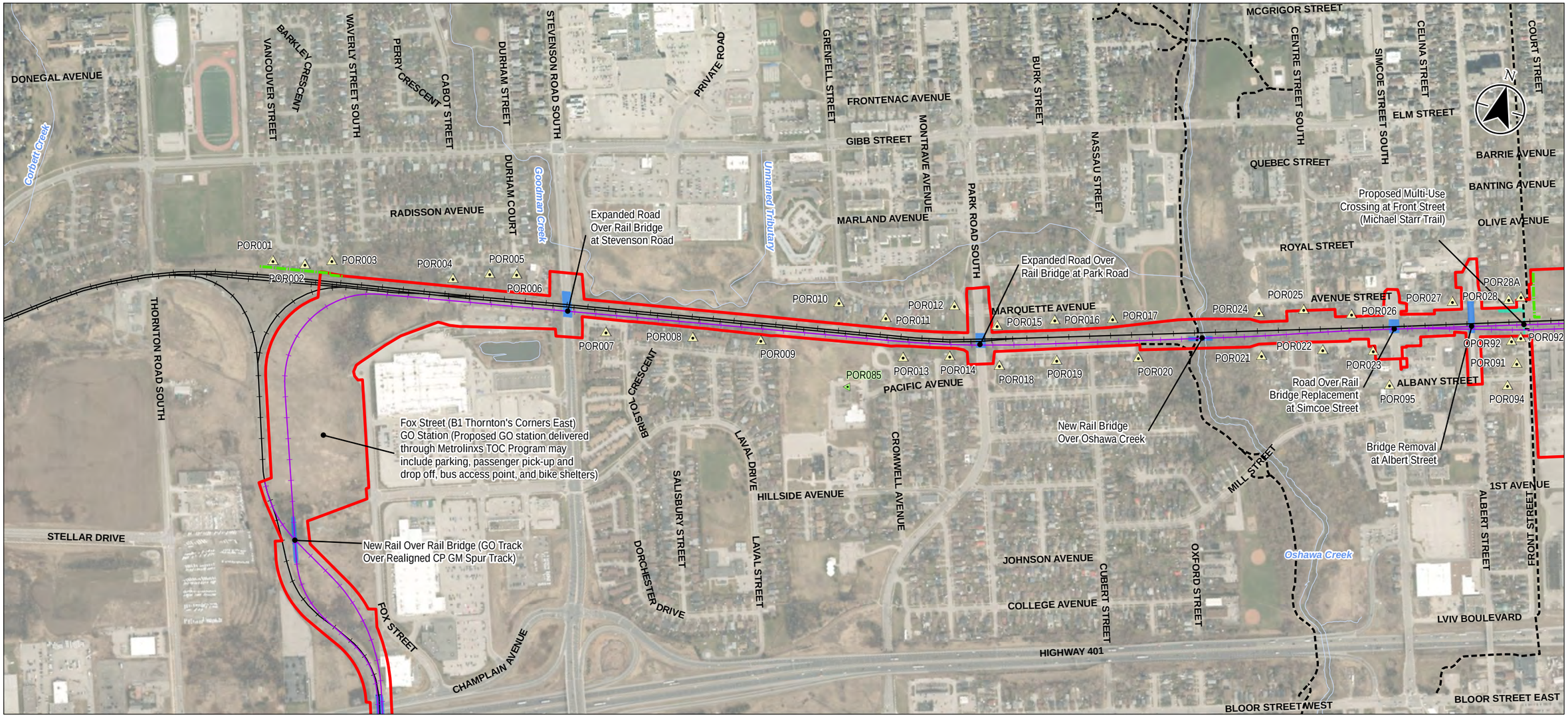
Project Location
Regioan Municipality of Durham

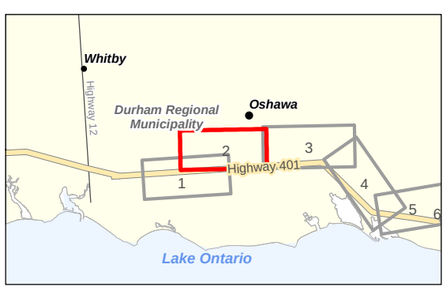
165011019 REVA
Prepared by BCC on 2023-08-24
Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
3.1.1

Title
Noise / Vibration Points of Reception





Legend

- Project Footprint
- Existing Railway
- Proposed Tracks
- Recommended Noise Wall
- Multi-Use Crossing
- Bridge Structure
- Trail
- Watercourse
- Waterbody
- Noise Representative Receptors
- Noise Receptor - Construction

Notes

1. Coordinate System: NAD 1983 CSRS MTM 10
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0 200 400 m

1:8,000 (At original document size of 11x17)

Stantec

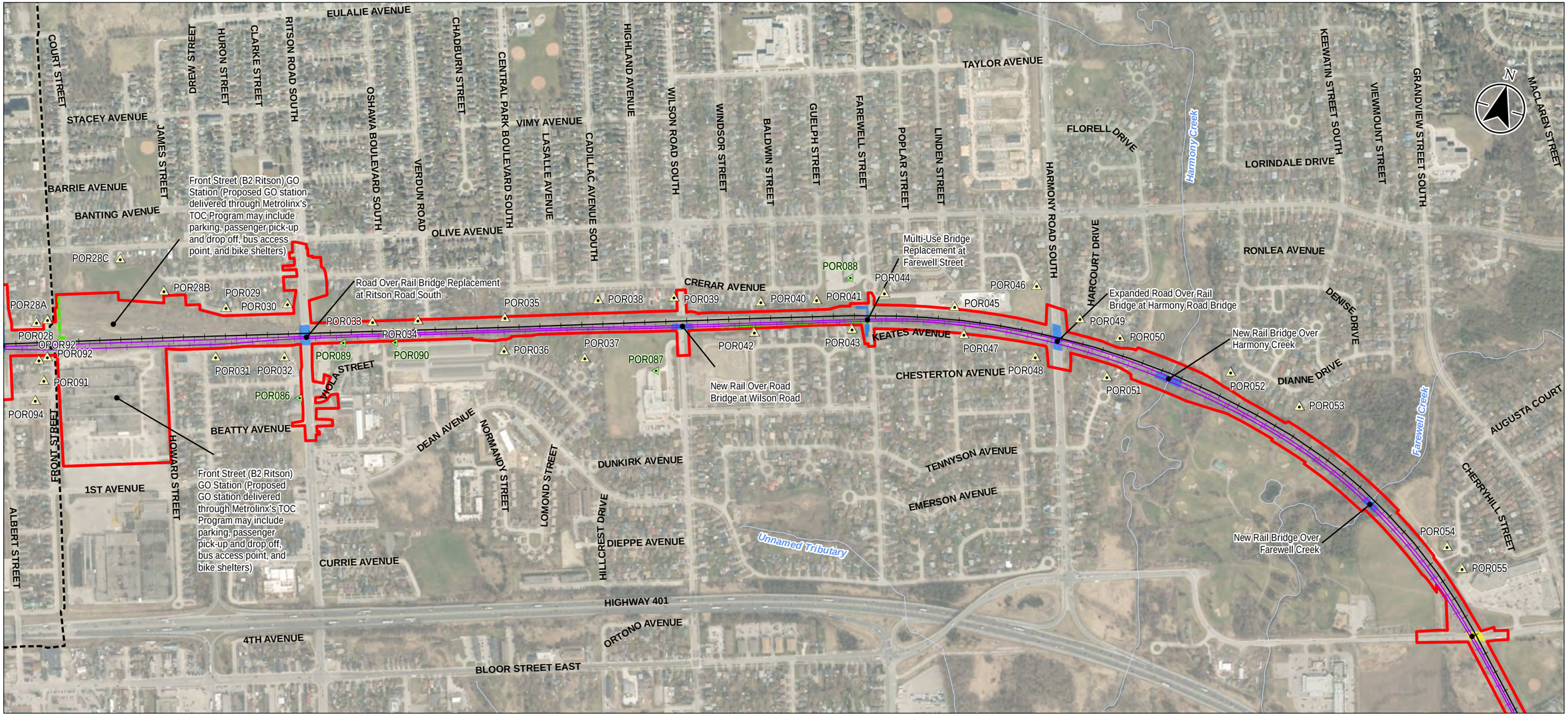
Project Location
Regioan Municipality of Durham

165011019 REVA
Prepared by BCC on 2023-08-24
Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
3.1.2

Title
Noise / Vibration Points of Reception



Notes

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3. Orthoimagery © First Base Solutions, 2021. Imagery Date, 2019.

Legend

- Project Footprint
- Existing Railway
- Proposed Tracks
- Recommended Noise Wall
- Multi-Use Crossing
- Level Crossing
- Bridge Structure
- Trail
- Watercourse
- Waterbody
- Noise Representative Receptors
- Noise Receptor - Construction

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Stantec

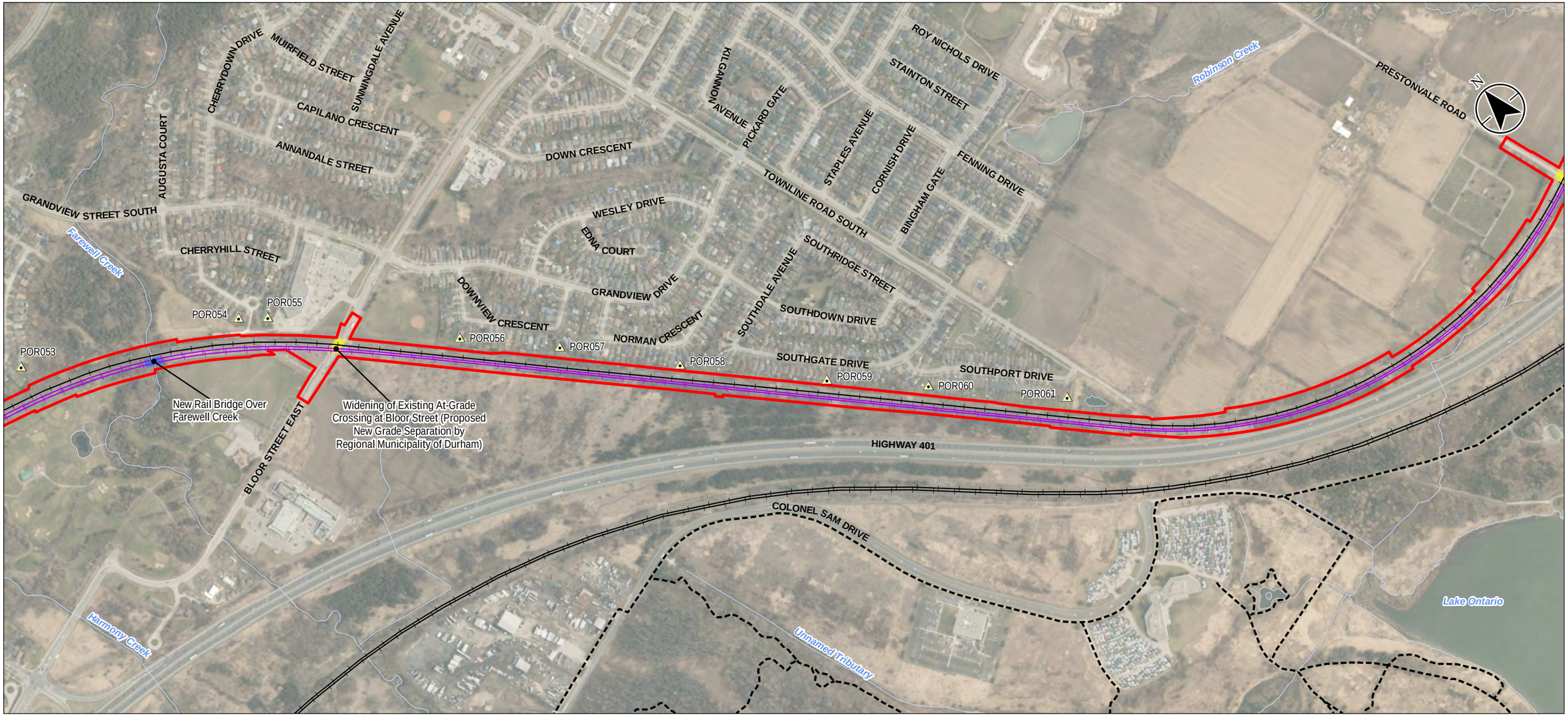
Project Location
Regioan Municipality of Durham

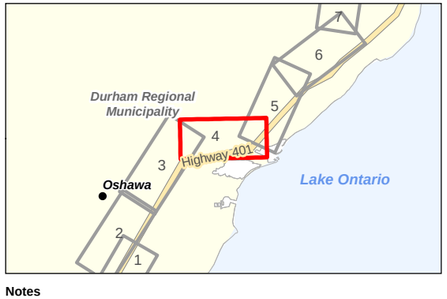
165011019 REVA
Prepared by BCC on 2023-08-24
Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
3.1.3

Title
Noise / Vibration Points of Reception





Legend

- Project Footprint
- Existing Railway
- Proposed Tracks
- Level Crossing
- Bridge Structure
- Trail
- Watercourse
- Waterbody
- Noise Representative Receptors

Notes

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Stantec

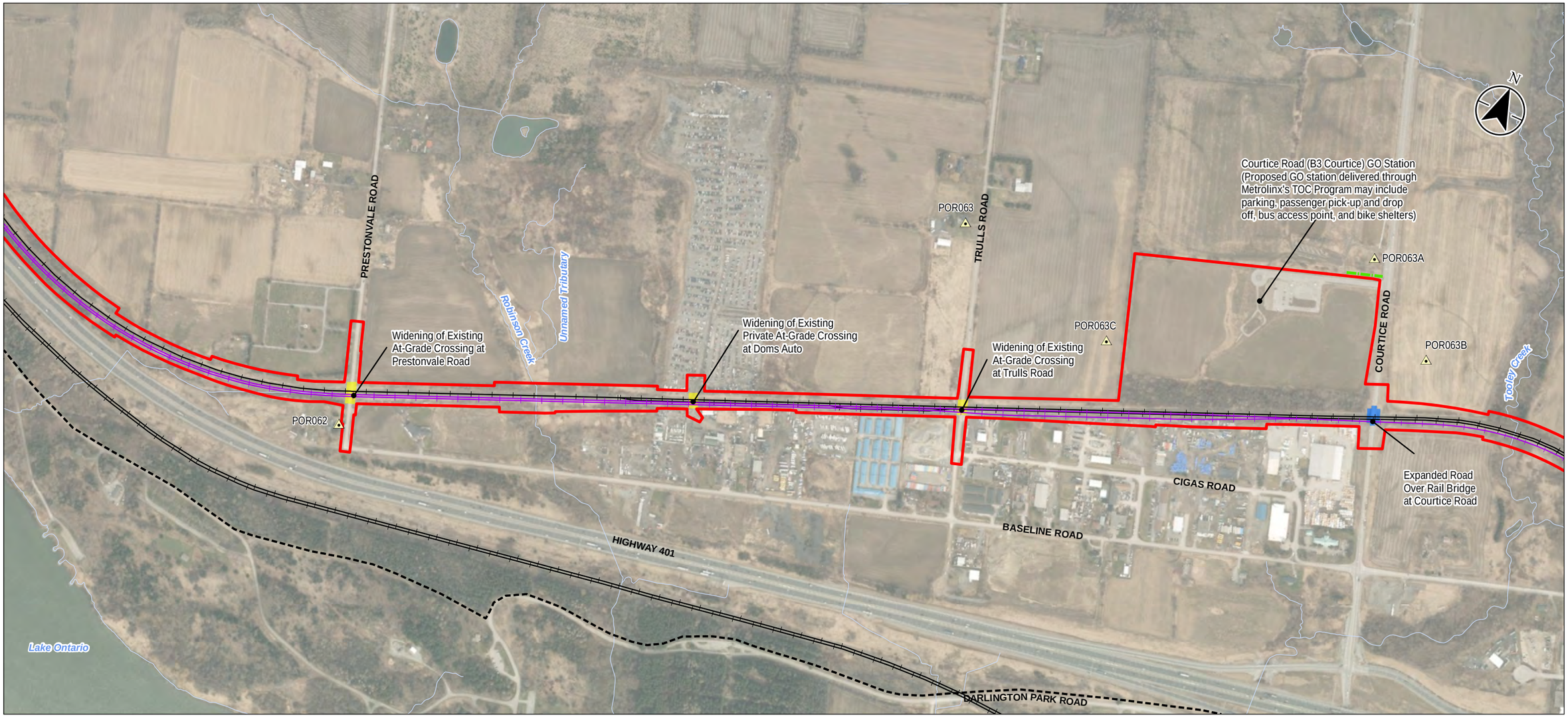
Project Location
Regioan Municipality of Durham

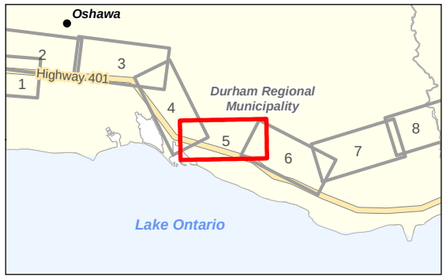
165011019 REVA
Prepared by BCC on 2023-08-24
Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
3.1.4

Title
Noise / Vibration Points of Reception





Legend

- Project Footprint
- Existing Railway
- Proposed Tracks
- Recommended Noise Wall
- Level Crossing
- Bridge Structure
- Trail
- Watercourse
- Waterbody
- Noise Representative Receptors

0 200 400 m

1:8,000 (At original document size of 11x17)

Notes

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3. Orthoimagery © First Base Solutions, 2021. Imagery Date, 2019.

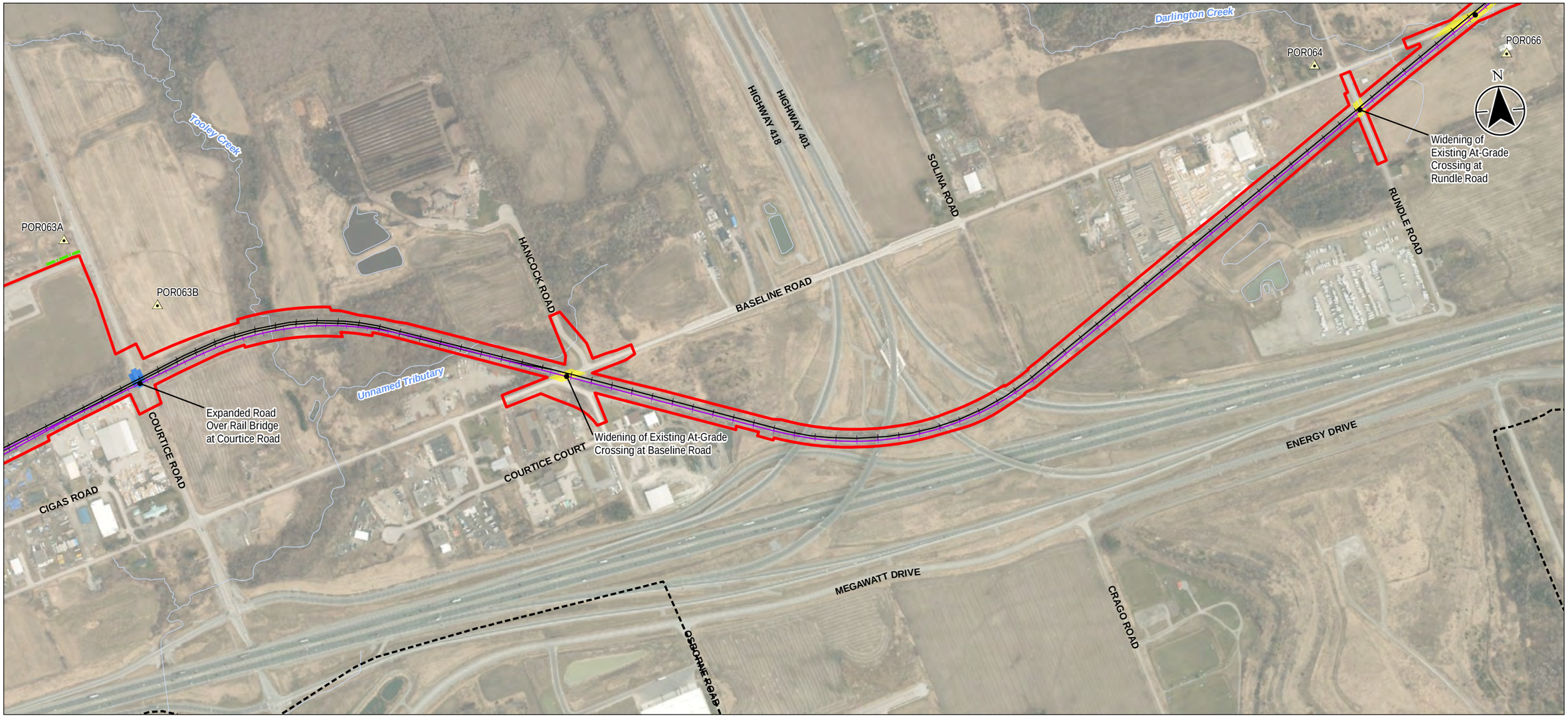
Stantec

Project Location Regioan Municipality of Durham	165011019 REVA Prepared by BCC on 2023-08-24 Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
3.1.5

Title
Noise / Vibration Points of Reception



Legend

- Project Footprint
- Existing Railway
- Proposed Tracks
- Recommended Noise Wall
- Level Crossing
- Bridge Structure
- Trail
- Watercourse
- Waterbody
- Noise Representative Receptors

Notes

1. Coordinate System: NAD 1983 CSRS MTM 10
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.
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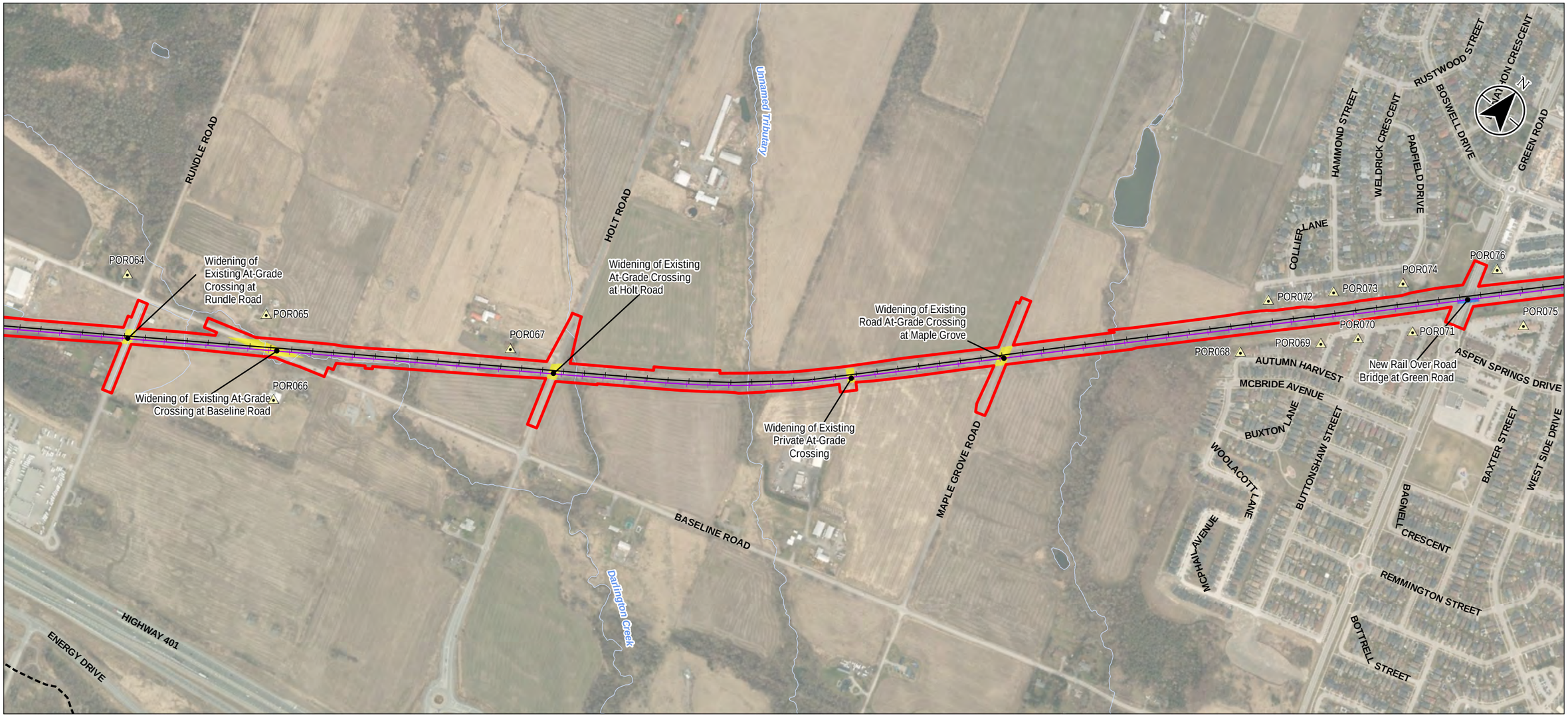
Stantec

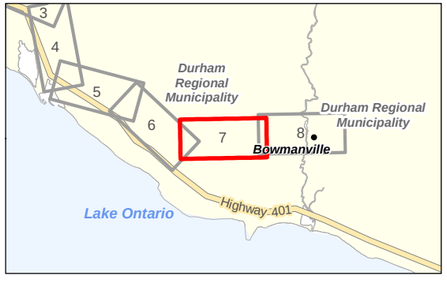
Project Location	165011019 REVA
Regioan Municipality of Durham	Prepared by BCC on 2023-08-24
	Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
3.1.6

Title
Noise / Vibration Points of Reception





Legend

- Project Footprint
- Existing Railway
- Proposed Tracks
- Level Crossing
- Bridge Structure
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Notes

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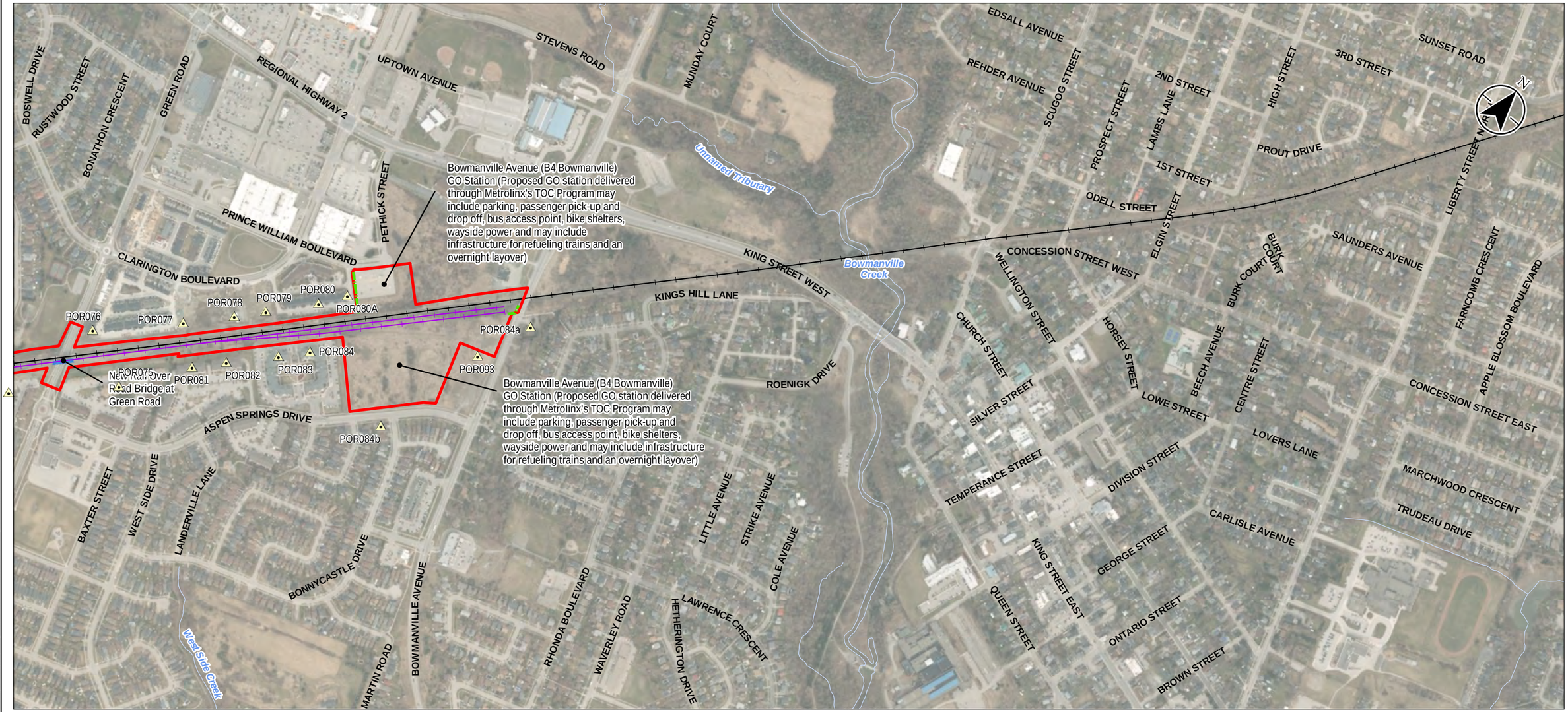
Stantec

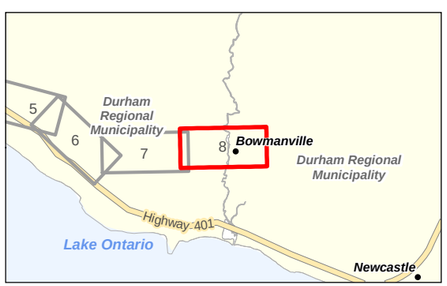
Project Location	165011019 REVA
Regioan Municipality of Durham	Prepared by BCC on 2023-08-24
	Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
3.1.7

Title
Noise / Vibration Points of Reception





Legend

- Project Footprint
- Existing Railway
- Proposed Tracks
- Recommended Noise Wall
- Bridge Structure
- Watercourse
- Waterbody
- Noise Representative Receptors

Notes

1. Coordinate System: NAD 1983 CSRS MTM 10
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Stantec

Project Location
Regioan Municipality of Durham

165011019 REVA
Prepared by BCC on 2023-08-24
Technical Review by ## on 2021-##-##

Client/Project
METROLINX
OSHAWA TO BOWMANVILLE RAIL SERVICE EXTENSION PROJECT

Figure No.
3.1.8

Title
Noise / Vibration Points of Reception

3.6.2.2 Construction

Construction noise was assessed by establishing a Zone of Influence (ZOI). The ZOI for construction noise is defined as the land in or adjacent to a construction site, which is potentially impacted by construction noise equal to or greater than the criteria. Depending on the construction phase, some of the residential, institutional, and commercial PORs considered in the assessment are within the established noise ZOI and may be impacted. No industrial PORs were identified within the applicable noise ZOIs.

Both emission-based and receptor-based noise assessments were completed for the Project construction in accordance with the MECP Publication NPC-115 and NPC-118 and the Metrolinx Environmental Guide. The construction vibration was assessed in accordance with the Metrolinx Environmental Guide.

Construction Noise Assessment

Construction noise for the Project was assessed using two methods:

1. Emission-based assessment – comparing the reference sound levels for the anticipated construction equipment against the applicable sound level limits in MECP NPC-115 and NPC-118 to identify the need for additional noise control during construction phases.
2. Receptor-based assessment – establishing a construction ZOI for noise based on the noise limit established in the Metrolinx Environmental Guide to identify surrounding areas that may be impacted during each construction phase and identify mitigation and monitoring requirements.

The construction noise ZOI was calculated for the construction phase based on a general understanding of the type and quantity of construction equipment that would be needed for various activities, and reference sound levels for the equipment. As a conservative approach, it was assumed that the associated construction equipment will be operating simultaneously during the construction period (i.e., weekdays 08:00 – 17:00) with the loudest piece of equipment located at the closest Project Footprint boundary to the receptor. The remaining equipment was evenly distributed conservatively along the Project Footprint boundary on either side of the loudest equipment with a minimum 25 m between each piece of equipment.

Construction Vibration

Construction vibration impacts were evaluated by establishing the construction vibration ZOI. Construction vibration ZOIs are calculated based on the applicable vibration limits for building damage based on the Metrolinx Environmental Guide construction vibration limits (Metrolinx 2019b). This assessment considered a vibration limit of 5 millimetres per second (mm/s) for typical construction (e.g., non-engineered timber and masonry buildings) and 3 mm/s for heritage structures.

The assessment established a construction vibration ZOI for the worst-case vibration event for each Project component.

3.6.2.3 Operations

Based on the Metrolinx Environmental Guide, study scenarios are required for both the assessment of noise and vibration generated by heavy rail projects and new sources of stationary sound such as the GO stations. A summary of the required scenarios and assessment criteria are provided in Table 3.2.

Table 3.2: Noise and Vibration Study Scenarios

Project Component	Assessment Criteria	Study Scenarios	Description
Rail	Change (Sound or Vibration) Per MOEE/GO Draft Protocol (1995)	Pre-Project	Sound and vibration levels prior to the undertaking. Represented by the levels of rail activity prior to the Project.
		Post-Project	Sound and vibration levels after the undertaking. Represented by the maximum level of rail activity enabled by the Project (potentially 10 to 20 years in the future).
Stationary sources of sound associated with GO stations	Absolute Limit (Sound only) Per MECP NPC-300	Post-Project	Sound levels after the undertaking. Represented by the maximum level associated with the GO Stations.
Stationary and rail sources associated with layover site (at Bowmanville Avenue (B4 Bowmanville) GO Station)	Absolute Limit (Sound only) per MECP NPC-300	Post-Project	Sound levels after the undertaking. Represented by the maximum level associated with the project Layover site.

Project Component	Assessment Criteria	Study Scenarios	Description
Emergency Power Generators associated with GO stations	Absolute Limit (Sound only) Per MECP NPC-300	Post-Project	Sound levels after the undertaking. Represented by the maximum level associated with the emergency generator testing for the GO stations.

Operations Noise (Rail)

Noise generated sources from the proposed rail expansion were assessed by identifying representative PORs within the Noise and Vibration Assessment Area and establishing pre-Project (i.e., the existing acoustical environment or baseline acoustical conditions) noise levels at the receptors due to existing rail operations. Predicted Project daytime ($L_{eq\ (16\ hr)}$) and nighttime ($L_{eq\ (8\ hr)}$) sound levels at the representative receptors were compared with the pre-Project sound levels as part of the assessment. The resulting Adjusted Daytime and Nighttime Noise Impact, which is the difference between the Pre-Project and Project sound levels, was used to assess the effects of noise during operations.

Train idling at the GO stations is included as part of the post-Project rail operations. Trains are expected to idle at GO stations for about 90 seconds and at the layover facility for about an hour. Therefore, time-weighting for train idling was included in the assessment.

Train horn and whistle noise at-grade road-rail crossings is included as part of the existing and post-project rail operations. Trains are expected to obey the Transport Canada Canadian Railway Operating Rules (May 2022) which mandate the use of horns and whistles. Horns and whistles have been considered for all at-grade crossings within the Project Footprint. Sound power levels for horn/whistle noise for trains has been assumed to be 96 dBA at 30 meters based on the Transport Canada Locomotives Design Requirements (Part II) Section 11.2.

Rail squeal noise has been modelled along the curved track segment at the beginning of the Project corridor in Oshawa. Rail squeal noise occurs when the gauge of the track varies, and a train runs over it. The resulting sizing difference generates a grinding and squealing noise which is both a nuisance and a maintenance issue as it reduces the lifetime of the track. Passenger train locomotive noise has been modelled at a height of 2.5 m and passenger cars at a height of 0.3m. A 5 dB penalty has been added to passenger car noise along this segment of track.

Operations Vibration (Rail)

Potential impacts from rail vibration were assessed using field measurements. The Root Mean Square (RMS) vibration velocity, measured in units of mm/s, is defined as the appropriate descriptor for vibration level for assessing annoyance.

Based on the identification of representative measurement locations in the Noise and Vibration Assessment Area, ground-borne vibration measurements were conducted for a minimum of three to five train passby events where possible. Since trains will be the same following expansion (just at a higher frequency), existing traffic can be used to measure future impacts. Criteria for operation vibration was determined based on the measured vibration levels generated by the existing CP Rail train movements. Based on the measurements and in accordance with the MOEE/GO Draft Protocol (1995), a vibration limit of 0.175 mm/s (RMS) was calculated for the Project operation rail vibration assessment for the existing dwellings. All new developments are assessed with a vibration limit of 0.14 mm/s (RMS).

An assessment of vibration at the closest receptors was completed and mitigation measures were recommended.

Operations Noise (GO Station/Layover Facility Station Stationary Sources)

Sound levels are predicted at the receptors using the Cadna/A noise model and assessed with the MECP NPC-300 limits. Daytime, evening, and nighttime sound levels are predicted based on the noise sources operating at the GO stations and layover facility. Daytime hours are defined as 07:00 – 19:00, evening hours are defined as 19:00 – 23:00, and nighttime hours are defined as 23:00 – 07:00.

The following stationary noise sources are expected at each of the four proposed GO stations and layover facility:

- emergency power generator
- Heating, Ventilation and Air-conditioning (HVAC) units
- public address (PA) system
- idling buses
- bus loop

Bus idling is included near bus shelters within the GO station area, based on the estimated numbers of bus parking proposed at each GO station.

The emergency power generators are modelled separately as required by the guideline for GO stations and layover facility.

HVAC units and passenger announcement systems are modelled at the station platforms. Measured sound levels from typical GO station PA systems were used in the assessment. HVAC units were modelled using representative sound power levels from Stantec's noise database.

Other sources such as exhaust fans and boilers at the GO stations are considered to be insignificant sources of noise as they are typically not audible and quieter than the significant noise sources such as bus loops and idling buses. Idling trains are assessed as part of the rail noise assessment as required by the guidelines.

An assessment of vibration is not required for the stationary sources as they are insignificant source of vibration and assumed to have negligible impact on nearby sensitive receptors.

The proposed layover facility, including a fueling station, is located just east of the Bowmanville Avenue (B4 Bowmanville) GO Station. Two idling trains with two locomotives on the east end of the trains and an air compressor were modeled as significant noise sources. The layover facility also includes indoor fuel pumps and fuel storage tank exhausts which are considered to be insignificant sources based on their sizes, capacities, and locations. The noise impact of the two emergency generators were assessed separately as required by the NPC-300 guideline.

3.7 Socio-Economic and Land Use

The Socio-Economic and Land Use Characteristics Assessment involved the collection of relevant planning and neighborhood information to characterize existing conditions. Potential effects from the Project were identified based on the changes from existing conditions.

A Socio-Economic and Land Use Characteristics Assessment Area represents the geographical area within a 500 m buffer around the Project Footprint representing the highest potential for direct or indirect effects to the socio-economic environment and land use characteristics.

The Socio-Economic and Land-Use Characteristics Assessment can be found in Appendix A5.

3.7.1 Existing Conditions

Data collection focused on the compilation of information required to describe current and anticipated socio-economic and land use characteristics within the Socio-Economic and Land Use Assessment Area that may be affected by Project construction and operations, based on a desktop review and gap analysis of available information. Information was gathered regarding planning policy, neighbourhood profiles, existing land use and development applications, built form and visual characteristics and utilities.

Desktop review and analysis included both literature review and GIS analysis of geospatial data. The reviewed literature included:

- Project documents and supporting studies (e.g., design drawings, technical presentations)
- GO Expansion Program (GO Expansion Full Business Case; Metrolinx 2018a)
- 2041 Regional Transportation Plan (RTP) (Metrolinx 2018b)
- Information on existing land uses found on the City of Oshawa Open Data Portal (City of Oshawa, 2020)
- Provincial, Regional, and Municipal Plans, Legislation and Policy Statements
- Durham Region Official Plan (including land use maps, secondary plans, site and area specific maps, and special policy areas as relevant) (2020)
- City of Oshawa Official Plan (including land use maps, secondary plans, site and area specific maps, and special policy areas as relevant) (2022a)
- Municipality of Clarington Official Plan (including land use maps, secondary plans, site and area specific maps, and special policy areas as relevant) (2018)
- Development applications (from City of Oshawa and Municipality of Clarington)
- Statistics Canada Census information (Statistics Canada 2022, 2023a, 2023b)
- The Credit Valley-Toronto and Region-Central Lake Ontario (CTC) Source Protection Plan (including mapping of vulnerable areas for the protection of drinking water sources) (CTC Source Protection Committee 2022)
- Source Protection Information Atlas (2021)

GIS-based overlay mapping and analysis tools were used to identify current and anticipated land uses within the Socio-Economic and Land Use Assessment Area. Geospatial data used in the analysis were obtained from the Regional Municipality of Durham and City of Oshawa Open Data Portals (Regional Municipality of Durham 2021; City of Oshawa, 2020).

3.7.2 Effects Assessment

The effects assessment was based on this background information and the extent of temporary and permanent activities were qualitatively compared to existing uses to identify where Project interactions may result in negative effects to existing uses or conditions.

The following analytical techniques were used in the assessment to assess potential effects on the socio-economic and land use features within the Socio-Economic and Land Use Assessment Area for Project construction and operations:

- GIS-based overlay mapping and analysis tools were used to identify potential interactions between the Project and existing and anticipated land uses.
- Potential effects on socio-economic and land use characteristics were described qualitatively in relation to Project construction and operations. Where appropriate, information and conclusions from supporting assessments (e.g., Noise and Vibration Technical Report, and AQ Technical Report) were cross-referenced, summarized, and incorporated into the assessment.
- Project-facing viewpoint photographs and aerial images were qualitatively reviewed to inform the characterization of existing conditions and visual effects and aesthetic effects.

The CTC Source Protection Plan (2022) and Source Protection Information Atlas (2021) were reviewed to determine where Project components overprinted vulnerable areas. Once identified, the anticipated effects to vulnerable areas for source water protection were assessed based on the extent of potential environmental interactions anticipated during construction and operations.

3.8 Traffic and Transportation

The Traffic Impact Analysis (TIA) assessed anticipated temporary and permanent impacts on the transportation network within the TIA Assessment Area. The TIA included key intersections in proximity to the rail extension alignment and proposed GO station locations.

The overall TIA Assessment Area was divided into four focus areas around the proposed GO station locations to understand the impacts on the adjacent area network. Focus areas included:

- Focus Area B1: Fox Street (B1 Thornton's Corners East) GO Station
- Focus Area B2: Front Street (B2 Ritson) GO Station
- Focus Area B3: Courtice Road (B3 Courtice) GO Station
- Focus Area B4: Bowmanville Avenue (B4 Bowmanville) GO Station

The TIA can be found in Appendix A6.

3.8.1 Existing Conditions

Traffic data was obtained from the Regional Municipality of Durham and the MTO. Data included historical Turning Movement Counts (TMC), Synchro models with intersection signal timing plans for the AM and PM peak periods, and the Durham Region Transportation Planning Model (DRTPM) EMME model for the 2031 AM peak horizon.

Historical TMC data was collected between 2016 – 2020. These traffic volumes were used for the Existing Condition analysis. Based on scoping discussions with the Regional Municipality of Durham and Metrolinx, no generic/global background growth rate was applied to historical TMC data for the Existing Conditions traffic impact analysis.

A nominal background growth rate of 1.5% was applied to TIA Assessment Area intersections to assess the Construction Staging scenario anticipated to occur in the year 2024.

Future 2031 traffic projections relied on the DRTPM long-range EMME model, as well as other background studies, provided by the Regional Municipality of Durham. The methodology for forecasting 2031 traffic demands is outlined in subsequent sections.

In addition to the traffic data received from the Regional Municipality of Durham and the MTO, relevant background studies were reviewed to better inform the evaluation of the transportation network, particularly for the Future 2031 future horizon.

The following background studies were reviewed and considered as part of this study:

- Durham Transportation Master Plan 2017 (December 2017)
- City of Oshawa One-Way Conversion Study (Draft – May 2021)
- The Region of Durham Regional Cycling Plan (2021)

- Durham Region Major Transit Station Areas Study (December 2021)
- City of Oshawa's Integrated Transportation Master Plan and Active Transportation Master Plan (2015)
- Highway 401 from Brock Road to Courtice Road Class EA & Preliminary Design Study (2014)
- Durham Region and City of Oshawa Central Oshawa GO Station Transportation Review Study (Dillon Consulting, April 2020)

Existing intersection level of service analysis was conducted using the Synchro 10 software package. Existing signal timing parameters received from the Regional Municipality of Durham was used to assess intersection operations under existing conditions and optimized as necessary.

3.8.2 Effects Assessment

The TIA evaluates two locations, Simcoe Street and Ritson Road, where road closures were identified during early design in order to facilitate construction staging. Additional road closures at Stevenson Road, Park Road, Harmony Road, and Courtice Road were identified as design progressed and will be analyzed, as required, as part of the development of Traffic Control and Management Plans prior to construction.

The traffic evaluation was comprised of three scenarios for which AM and PM peak hour intersection level of service (LOS) analyses were performed.

Table 3.3 provides a summary of the assumptions used in each scenario.

Table 3.3: Traffic Analysis Scenario Summary

Scenario	Roadway Conditions	Traffic Volumes	Focus Area
Existing Conditions	Existing Road Network	Existing traffic volumes based on historical TMCs	All Focus Areas
Future 2031	Future 2031 Road Network	2031 DRTPM model volumes, City of Oshawa Two-Way Conversion traffic volumes distribution, redistribution of Albert Street closure volumes.	All Focus Areas

Scenario	Roadway Conditions	Traffic Volumes	Focus Area
Representative Construction Staging			
Simcoe Road Closure (2024)	Existing Road Network	Projected Existing Conditions traffic volumes to 2024. Anticipated traffic redistribution due to closure estimated using the DRTPM model for Existing Conditions.	Focus Area B2
Ritson Road Closure (2024)	Existing Road Network	Projected Existing Conditions traffic volumes to 2024. Anticipated traffic redistribution due to closure estimated using the DRTPM model for Existing Conditions.	Focus Area B2

3.8.2.1 Methodology

The TIA process and assessment was prepared based on the following guidelines:

- The Regional Municipality of Durham Traffic Impact Study Guidelines (October 2011) will be adopted for assessing municipal roadways and intersections (Regional Municipality of Durham 2020b).
- The Ministry of Transportation, Ontario (MTO) Traffic Impact Study Guideline (September 2014) will be adopted for TIA Assessment Area intersections and ramp terminals at provincially controlled highways (i.e., 400-series facilities).

3.8.2.2 Level of Service

LOS analyses of the traffic operations were performed at the study intersections utilizing the Synchro 10 software package, which utilizes the latest Highway Capacity Manual (HCM) methodologies.

The TIA Assessment Area intersections were modeled with the existing geometry and signal timing operation based on the Synchro models provided by Regional Municipality of Durham. Capacity analyses are evaluated based on a LOS based on “average vehicular delay” that ranges from an LOS rating of A (excellent) to and LOS rating of F (poor).

Table 3.4 outlines the LOS thresholds based on the HCM parameters.

Table 3.4: Intersection LOS Criteria

LOS	Control Delay Per Vehicle (seconds) Signalized Intersection	Control Delay Per Vehicle (seconds) Stop-Controlled Intersection
A	≤ 10	≤ 10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	> 80	> 50

From a traffic operations perspective, LOS ratings ranging between an LOS of A through to an LOS of D are considered acceptable.

For stop-controlled intersections, the LOS for the worse approach was reported. Based on the Regional Municipality of Durham's Traffic Impact Study Guidelines (2010), LOS "D" or better is considered acceptable since the TIA Assessment Area is part of regional center.

Other parameters that are used to identify critical intersection movements that may require mitigation include:

- Intersection movements operating at volume to capacity (v/c) ratios of 0.90 or higher (LOS E).
- Intersection movements operating with average delays of 55s or more (LOS E).
- For ramp terminal intersections at 400-series highways, intersections operating at a volume to capacity (v/c) ratio of 0.85 or higher will be identified.

3.9 Cultural Environment

The cultural environment is assessed through consideration of cultural heritage and archaeology in separate reports, as described below.

3.9.1 Built Heritage Resources and Cultural Heritage Landscapes

The Cultural Heritage Report (CHR): Existing Conditions and Preliminary Impact Assessment was undertaken by Stantec Consulting Ltd. for the Project to:

- identify existing baseline cultural heritage conditions within the Cultural Heritage Assessment Area

- identify preliminary potential project-specific impacts on the known and potential Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) that have been identified

- propose and recommend measures to avoid or mitigate potential negative impacts to known or potential BHRs and CHLs

The Cultural Heritage Assessment Area for the Oshawa to Bowmanville Expansion has been defined to conservatively capture the full extent of Project effects and address relevant regulatory requirements. The Cultural Heritage Assessment Area is divided into two sections, the Project Footprint and the Cultural Heritage Assessment Area. The Project Footprint includes the total area potentially affected by the proposed construction activities. The Cultural Heritage Assessment Area extends 50 m around the Project Footprint along the rail alignment, bridges and crossings and 500 m around GO station centre points. The 50 m buffer was based on an understanding of potential Project effects, including the potential for vibration effects associated with Project construction and the transportation of project components and personnel. The 500 m buffer was based on the understanding that the exact location of new GO stations has not been finalized.

The CHR: Existing Conditions and Preliminary Impact Assessment is available in Appendix A7-1.

3.9.1.1 Existing Conditions

The CHR: Existing Conditions and Preliminary Impact Assessment consisted of data collection, background historic research, review of secondary source material and field review conducted in (June 28 to June 30, 2021) to identify the presence of known and potential BHRs and CHLs in or adjacent to the Cultural Heritage Assessment Area.

Listings of provincially and locally designated properties, districts, and easements for each municipality were collected from the Ontario Heritage Trust (OHT), the Ministry of Citizenship and Multiculturalism (MCM) (previously the Ministry of Tourism, Culture and Sports [MTCS]), Municipality of Clarington, and City of Oshawa. The Curve Lake First Nation identified wetlands as culturally significant and requested their inclusion in the CHR: Existing Conditions and Preliminary Impact Assessment. Consultation with agencies and municipalities within which the Project is proposed, was undertaken to determine the presence of designated, listed, or otherwise recognized heritage properties within or adjacent to the Cultural Heritage Assessment Area. In addition, a field visit was conducted to confirm existing conditions of previously identified heritage resources and identify any new potential heritage resources, including both potential BHRs and CHLs, to supplement the findings of the desktop review.

Culverts where also reviewed as potential built heritage resources. In general, these culverts were not accessible from public roadways during the field survey. To determine the potential for Cultural Heritage Value or Interest (CHVI), and to facilitate the screening process, photographs and descriptions of each culvert within the Project Footprint were reviewed.

3.9.1.2 Effects Assessment

The CHR: Existing Conditions and Preliminary Impact Assessment identified preliminary potential direct and indirect impacts on the known and potential BHRs and CHLs as well as recommended measures to avoid or mitigate negative impacts to those resources. As per the *Standards and Guidelines for Conservation of Provincial Heritage Properties* (MTCS 2010) and the *Metrolinx Interim Cultural Heritage Management Process* (Metrolinx 2013), properties/structures that Metrolinx anticipates acquiring (purchasing, managing, or controlling) and/or which may be directly impacted by the Project, and which have known or potential cultural heritage value, require further evaluation through a Cultural Heritage Evaluation Reports (CHER) as an initial step, and further assessment through a Heritage Impact Assessment (HIA) where necessary.

In relation to the potential for vibration damage, the CHR: Existing Conditions and Preliminary Impact Assessment incorporates the findings of the Noise and Vibration Technical Report (Appendix A4) in which receptor-based construction noise and vibration impacts for the Project were assessed as per Metrolinx Environmental Guide. Construction vibration impacts were evaluated by establishing a vibration ZOI per the applicable vibration criteria provided in the Metrolinx Environmental Guide for structural damage. A more stringent criteria of 3 mm/s, as defined by the United States Federal Transit Administration, is recommended for fragile heritage buildings and is used for heritage structures identified within the Cultural Heritage Assessment Area.

In the absence of construction details, construction vibration ZOIs were established relative to the Project Footprint. The assessment identified potential areas impacted by construction vibration and minimum setback distances required for the most impactful construction equipment to meet applicable vibration criteria limits. The assessment concluded an 11 m ZOI is required around each GO station within the Project Footprint, an 11 m ZOI is required around track and grading construction within the Project Footprint, and a 24 m ZOI is required around bridge modifications (i.e., new, removal, replacement or reconstruction). Vibration monitoring is recommended for those areas potentially impacted by construction vibration if the minimum setback distances cannot be maintained.

Based on the recommendations of the Cultural Heritage Report (CHR): Existing Conditions and Preliminary Impact Assessment, CHERs were undertaken. The CHERs were prepared in accordance with the *Draft Terms of Reference for Consultants:*

Cultural Heritage Evaluation Report and Cultural Heritage Evaluation Report Recommendations (Metrolinx 2016) and the *Standards and Guidelines for the Conservation of Provincial Heritage* (MTCS 2010). Based on the guidance provided in these documents, the CHERs contain:

- historical research and review of previously completed reports
- community input, as required
- evaluation against O. Reg. 9/06[25] and O. Reg. 10/06 and a statement of cultural heritage value of interest (CHVI), as appropriate
- identification of the property as “not a provincial heritage property”, a “provincial heritage property” or a “provincial heritage property of provincial significance” (Metrolinx 2016)

HIAs, if required, are completed in consultation with the MCM as early as possible during detail design, following the TPAP.

3.9.2 Archaeology

Archaeological assessments (AA) are conducted by licensed archaeologists, who prepare an archaeological assessment report and submit it to the MTCS for review. The MTCS reviews the report to ensure: the licensed archaeologist met the terms and conditions of their licence, including the Ministry's requirements for fieldwork and reporting, and any archaeological sites found were properly conserved.

A Stage 1 AA was undertaken on May 14, 2021 and May 17, 2021 by Stantec Consulting Ltd. for the Archaeology Assessment Area under Project Information Form (PIF) # P1148-0004-2021 to consider the potential effects to known or potential archaeological resources for the Project. The Stage 1 Assessment Area for the Stage 1 AA included a 20 m buffer around the rail alignment, 70 m buffer around at-grade crossings and bridges and a 500 m buffer around new GO station centre points.

The Assessment Area for the Stage 1 AA (PIF #P1148-0004-2021) of the lands associated with the Project comprises approximately 4,820 ha of various Lots and Concessions, former Township of East Whitby, former County of Ontario, now City of Oshawa, and former Darlington Township, former County of Durham, now Municipality of Clarington; Regional Municipality of Durham, Ontario.

[25] In 2023, O. Reg 9/06 was amended by O. Reg 569/22.

The Stage 1 AA for PIF #P1148-0004-2021 was submitted to the MCM as a condition of licensing in accordance with the *Ontario Heritage Act*. On May 9, 2023, the Stage 1 AA was entered into the Ontario Public Register of Archaeological Reports.

A second Stage 1 AA was undertaken on January 6, 2023 by Stantec Consulting Ltd. to capture additional areas added to the Project Footprint (refer to Section 1.3.1) under PIF #P1148-0067-2023. The second Stage 1 AA consisted of four areas:

- north of Mitchell Avenue
- east of Ritson Road South north of Kitchener Avenue
- at Hancock Road north of Baseline Road
- at McKnight Road south of Baseline Road

In keeping with the parameters of the original Stage 1 archaeological assessment for the Project, these additional Project Footprint areas were buffered by 70 m.

The Assessment Area for the Stage 1 AA of the additional lands associated with the Project comprises approximately 5.68 hectares on parts of Lot 8, Concession 1, Geographic Township of East Whitby, former County of Ontario, now City of Oshawa, and part of Lots 26 and 27, Concession 1 and Broken Front Concession, Geographic Township of Darlington, former County of Durham, now Municipality of Clarington, Regional Municipality of Durham, Ontario.

The Stage 1 AA for PIF # P1148-0067-2023 was submitted to the MCM as a condition of licensing in accordance with the *Ontario Heritage Act*. On August 16, 2023, the Stage 1 AA was entered into the Ontario Public Register of Archaeological Reports.

Based on the results of the Stage 1 AAs, further archaeological assessment is required in certain areas and a Stage 2 AA will be undertaken prior to the start of construction activities.

The Stage 1 AAs are included in Appendix A8.

3.9.2.1 Existing Conditions

A Stage 1 AA consists of a review of geographic, land use and historical information for the property and the relevant surrounding area, a property visit to inspect its current condition and contacting MTCS to find out whether or not there are any known archaeological sites on or near the property. Its purpose is to identify areas that have archaeological potential and that will require further assessment (Stage 2-4, as necessary). The Stage 1 AA will also identify areas that do not have archaeological potential and where there are no anticipated effects to archaeological resources.

Archaeological potential can be identified based on a variety of factors, including proximity to previously registered archaeological sites, distance to various types of water sources, soil texture and drainage, glacial geomorphology, elevated topography, and the general topographic variability of an area.

3.9.2.2 Effects Assessment

The effects assessment for archaeology confirmed whether Project activities may cause ground disturbance in any areas of archaeological potential identified in the Stage 1 AA. Further archaeological assessment is required in these areas to better understand the existing conditions and potential Project impacts. In areas that have been identified as not having archaeological potential, no impacts are anticipated for the Project.

3.10 EPR Addendum

3.10.1 Existing Conditions

A summary of the existing conditions described in each environmental technical report has been provided in Section 4.0 below. The methodologies relevant to existing conditions have been described in the preceding sections.

3.10.2 Effects Assessment for the EPR Addendum

The effects assessment of the proposed Project has been developed based on the analysis and results of technical discipline-specific environmental studies documented in the reports listed in Section 1.3.3 (which are located in Appendices A1 through A8 to this EPR Addendum). Issues raised by the public, stakeholders and Indigenous communities during consultation and engagement activities were also considered and incorporated as appropriate (refer to Section 7.0 for further information on consultation).

Further analysis of the mitigation measures identified in the 2011 EPR is required to confirm if any modifications to the recommended measures are required since 10 years have lapsed since the completion of the EPR, as per O. Reg. 231/08 Section 16. Section 5.10 provides an overview of the mitigation measures for the Project, and includes changes from the 2011 EPR. The current assessment reflected in this EPR Addendum includes and expands on relevant details from the 2011 EPR and therefore supersedes that document for the Project components subject to this addendum process.

The temporal boundaries for the effects assessment are defined based on the timing and duration of Project activities. The purpose of a temporal boundary is to identify when an environmental effect may occur in relation to specific Project phases and activities. The temporal boundaries for the EPR include the Project phases of:

- Construction: Early works construction will commence following the completion of the EPR Addendum. Major construction will follow thereafter[26].
- Operations: Following construction, ongoing operations and maintenance to support future GO service.

The potential for effects has been determined based on an understanding of the conceptual design and how construction and operations of the proposed Project will interact with existing environmental conditions. As outlined in Section 1.3.2, a separate analysis was undertaken to determine the significance of the Project changes following the 2011 EPR. This effects assessment considers those changes identified as "Significant" and "Not Significant", including:

- Significant
  - New GO Mainline Tracks
  - DC Oshawa GO Pedestrian Bridge
  - Highway 401 Bridge
  - General Motors (GM) Spur Bridge
  - Simcoe Street Bridge
  - Albert Street Bridge
  - Front Street (Michael Starr Trail) Multi-use Crossing
  - Ritson Road Bridge
  - Wilson Road Bridge
  - Harmony Creek Bridge
  - Farewell Creek Bridge
  - Green Road Bridge
  - Fox Street GO Station (B1 Thornton's Corners East)
  - Bowmanville Avenue GO Station (B4 Bowmanville)

[26] Construction schedule will be developed near the end of the Project development phase.

- Not Significant
  - Front Street GO Station (B2 Ritson)
  - Courtice Road GO Station (B3 Courtice)
  - Ancillary Structural Work
  - Stevenson Road Bridge
  - Park Road Bridge
  - Farewell Street Multi-Use Bridge
  - Harmony Road Bridge
  - Courtice Road Bridge

Project changes identified as “Minor” are not evaluated in this EPR Addendum.

Where applicable, Project components have been grouped into categories based on proximity in location and attributes of the components, and anticipated similarity of potential effects. These categories form the basis for the effects assessment for the Project (refer to Table 3.5).

Table 3.5: Project Component Categorizations

Category	Project Components	Categorization Rationale
Linear Facilities	• Trackwork • Ancillary Structural Work • Grading • Retaining walls	• Trackwork is associated with the new tracks adjacent to the existing CP Rail corridor. • Retaining walls are required to accommodate changes in grading for the corridor; the retaining walls and barriers will be located adjacent to the rail corridor. • Culvert modifications are associated with trackwork. • Linear components will have similar construction and operations activities.
GO Station Locations	• B1 Thornton’s Corners East, B2 Ritson, B3 Courtice, and B4 Bowmanville	• Anticipated activities at the GO stations are focused on managing effects during construction and operations of a new transit GO station. • Potential effects from the GO stations differ from those of Linear Facilities and Bridges and therefore this component was assessed singularly.

Category	Project Components	Categorization Rationale
Bridges	• New/replacement/expanded bridges over the rail corridor - Stevenson Road - Park Road - Simcoe Street - Ritson Road - Wilson Road - Harmony Road - Courtice Road - Green Road • Bridge removal at Albert Street • New bridges over creeks - Harmony Creek - Farewell Creek • Multi-use crossing/bridge - Front Street (Michael Starr Trail) - Farewell Street	• New bridges constructed directly adjacent to existing bridges. • Potential effects during construction of these bridges may differ from those of other types of bridges. • Bridges over watercourses may have potential effects that differ from new bridges over the rail corridor given the more sensitive natural heritage features that exist in close proximity. Where applicable, these features will be described relevant to the watercourse crossings.

Potential environmental effects resulting from the construction and operations of the Project components (as outlined above) were identified, analyzed, and described based on potential changes to the biophysical, social and economic, and cultural environments. Table 3.6, below, outlines the evaluation factors and related criteria.

The effects assessment is based on conservative (i.e., highest probable impacts, with the expectation that actual conditions will be less) assumptions regarding potential effects that could occur as a result of the Project. They are also based on existing environmental conditions, as outlined in Section 4.0, and information available at the time of the TPAP Addendum. The recommendations contained in this EPR will be reviewed by Metrolinx and updated as necessary as detailed design progresses.

Where potential negative effects have been identified, mitigation measures have been recommended, where available, to limit or avoid the potential for those effects. The Project has been designed to prioritize the avoidance of negative environmental effects, and mitigation measures are provided where avoidance is not feasible. Monitoring activities were also identified, where warranted, to evaluate effectiveness of proposed mitigation measures and provide feedback for adaptive management.

Section 6.0 of this EPR includes a specific discussion on climate change as it pertains to the Project.

Table 3.6: Criteria for Assessment of Effects for Environmental Components

Environment	Environmental Component	Criteria
Biophysical Environment	Natural Environment: Aquatic Environment	• Changes to watercourses providing fish habitat • Changes to the sensitivity of fish and fish habitat • Extent of fish habitat altered/displaced • Decreased water quality in watercourses
	Natural Environment: Terrestrial Environment	• Loss of existing vegetation communities
	Natural Environment: Wildlife	• Loss of wildlife (birds, mammals, and herpetofauna) • Impediments to wildlife movement and breeding and increases in animal mortality
	Natural Environment: SWH	• Loss of SWH (type and quality)
	Natural Environment: SAR	• Loss of designated SAR • Loss of SAR habitat
	Natural Environment: Significant Natural Features	• Loss of designated significant natural features
	Trees	• Loss of or impacts to trees
	Geology and Groundwater	• Reduced soil quality and soil loss • Potential to encounter contaminated material during construction activities • Reduced groundwater quantity/quality
	Stormwater Management	• Changes to stormwater runoff quantity: Potential for increase in peak flows, impact on storm drainage systems and erosion in receiving watercourses • Changes to storm runoff quality: Potential for increase in pollutant loading and effects to water quality
	Air Quality and GHG	• Changes to AQ and increases in GHG emissions effects during construction and operations of the Project
	Noise and Vibration	• Noise and vibration emissions during construction and operations at sensitive land uses • Potential increase in noise during construction at sensitive receptors

Environment	Environmental Component	Criteria
Social and Economic Environment	Land Use and Users	• Potential for land use compatibility conflicts • Potential for nuisance effects to neighbouring properties and residences
	Traffic and Transportation	• Changes to level of service at key Assessment Area intersections
	Utilities	• Potential for disruption to services • Changes to ongoing maintenance activities
	Source Water Protection	• Potential for impacts to source water protection resources
Cultural Environment	Archaeological Resources	• Potential for disturbance or destruction of archaeological resources
	Built Heritage Resources and Cultural Heritage Landscapes	• Direct and indirect effects to BHRs and/or CHLs from construction activities

4.0 Existing Conditions

This section of the EPR Addendum describes the existing environmental conditions within the Study Area (and discipline-specific Assessment Areas, where applicable). Where applicable existing conditions reported in the 2011 EPR were incorporated into this EPR Addendum, however given the lapse of time and the changing regulatory environment, updated baseline information was collected for all disciplines.

The existing conditions are used as the basis for measuring the potential environmental effects of the proposed works and to inform the identification of appropriate avoidance or mitigation measures.

Detailed information for each of the environmental components, including discipline-specific assessment areas, is provided in the environmental technical studies located in Appendix A.

4.1 Natural Environment

The following sections describe existing conditions related to the natural environment.

The aquatic environment is encompassed within all permanent bodies of still or flowing water and their riparian area (banks), including all parts of the bodies in which aquatic species may spend parts of their lifecycles.

The terrestrial environment includes plants and the combination of land-based natural features that provide habitat for plant and animal species.

Wildlife refers to land-based animals (including mammals, amphibians and birds), that occupy the terrestrial environment for all or a part of their life cycle, including breeding, feeding, or stopover during migration.

SAR are any plants, animals, birds or fish that are listed as endangered, threatened, special concern or extirpated on the SARO List provided in O. Reg. 230/08.

The Ministry of Natural Resources and Forestry (MNRF) generally categorizes Significant Wildlife Habitat into the following five categories:

- Seasonal Wildlife Concentration Areas
- Rare Vegetation Communities
- Specialized Habitat for Wildlife
- Habitats of SOCC
- Animal Movement Corridors

The presence or absence of SWH is considered indicative of the potential presence of wildlife.

Significant natural heritage features includes designated natural areas such as Provincially Significant Wetlands (PSW), Areas of Natural and Scientific Interest (ANSIs) and Environmentally Sensitive Areas.

4.1.1 Aquatic Environment

The Natural Environment Assessment Area intersects the Oshawa Creek, Harmony Creek, Farewell Creek, Robinson Creek, Tooley Creek and Darlington Creek watersheds. These creeks all drain south towards Lake Ontario which is located between 0.5 and 3.5 km south of the Natural Environment Assessment Area. Historically, these watersheds supported cold-water fish communities featuring Brook Trout and Atlantic Salmon. With increasing urbanization and changing land use patterns, many of the cold-water streams have become cool-water or warm-water systems (CLOCA 2007). Many the streams in the Natural Environment Assessment Area support coldwater fishes such as Rainbow Trout (*Oncorhynchus mykiss*).

The following subsections summarize the fish and fish habitat observations at 14 watercourse crossing locations (WC) identified in the Natural Environment Assessment Area.

Additional surveys will be commencing at the detailed design phase to support any proposed removals or alterations to the existing headwater drainage feature associated with the Courtice Road (B3 Courtice) GO Station development.

Goodman Creek – WC-1

Goodman Creek flows through Warne Park north of the railway alignment and east of Stevenson Road South. Goodman Creek is in the Oshawa Creek watershed. Within the Natural Environment Assessment Area, Goodman Creek is mapped as a warmwater watercourse (MNRF 2021a). CLOCA has completed long-term water temperature monitoring at a station within this reach (the nearest station to the Project Footprint is CLOCA Station TLGN01 [within the Natural Environment Assessment Area]) and classifies this reach of Goodman Creek as coolwater habitat (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach five times between 2017 and 2019. Seven species of fish were captured including Western Blacknose Dace (*Rhinichthys obtusus)*, Brook Stickleback (*Culaea inconstans)*, Creek Chub (*Semotilus atromaculatus)*, Fathead Minnow (*Pimephales promelas)*, Johnny Darter (*Etheostoma nigrum)*,

Pumpkinseed (*Lepomis gibbosus)*, and White Sucker (*Catostomus commersonii)*. These species are considered secure common, widespread, and abundant in Ontario (S5) (MNRF 2023b). There are no MNRF fish records available for Goodman Creek (MNRF 2021a). During surveys completed in July 2021, fish were observed visually in this reach including Fathead Minnow (*Pimephales promelas),* Creek Chub, and Brook Stickleback.

Fish Habitat

The following fish habitat characteristics were noted at this WC:

- Fast flow and high stream stage conditions were observed on July 16, 2021, following periods of rainfall in the previous 24 hours (hrs). Water was a turbid- brown colour.
- In-stream cover was sparse (<10%) and provided by undercut banks, boulders embedded in the bank, logs embedded in the banks, Canada Waterweed (Elodea Canadensis) and terrestrial grasses overhanging the channel.
- Banks were generally steep. Outer bend banks showed signs of recent erosion. Inner bend banks were vegetated and protected by shrubs (i.e., Red-o- sier Dogwood) and terrestrial grasses and herbaceous plants.
- Substrate was dominated by sand with sparse boulders which were embedded in the outer banks.
- Morphology at this WC was entirely ‘Run’.
- Stream dimensions - Mean wetted width: 2.3 m; Mean bankfull width: 2.3 m; Mean depth 42 centimetre (cm); Maximum pool depth: 78 cm.
- Canopy was 100% open.
- Riparian vegetation within 5 m was wetland and meadow dominated by Phragmites and other grass species.
- Adjacent land use was a municipal park with multi-use trails, commercial retail buildings with parking lots, the railway corridor and municipal roads.
- No critical habitat for fish was observed. No migratory obstructions for fish were observed.

Summary

Within the Natural Environment Assessment Area, Goodman Creek provides direct warmwater fish habitat according to MNRF records. CLOCA long-term water temperature monitoring indicates this reach provides coolwater fish habitat. There are no records of provincially or federally protected aquatic SAR.

Oshawa Creek – WC-2

Oshawa Creek flows under the railway bridge between Regional Road 56 and Regional Road 2. Within the Natural Environment Assessment Area, Oshawa Creek is mapped as a coldwater watercourse (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at stations within this reach (the nearest stations to the Project Footprint are CLOCA Station TLOA05 [outside of the Natural Environment Assessment Area] and TLOA13 [inside of the Natural Environment Assessment Area]) and classifies this reach of Oshawa Creek as coolwater habitat (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach five times between 2011 and 2019. In total eleven fish species were captured including: Brown Trout (*Salmo trutta*), Creek Chub, Johnny Darter, Longnose Dace (*Rhinichthys cataractae)*, Mottled Sculpin (*Cottus bairdii*), Pumpkinseed, Rainbow Trout (*Oncorhynchus mykiss)*, Sea Lamprey (*Petromyzon marinus*), Smallmouth Bass (*Micropterus dolomieu),* Western Blacknose Dace, and White Sucker. These species represent a diversity of warmwater, coolwater and coldwater preferences. These species are common, widespread and abundant in Ontario except for Brown Trout (*Salmo trutta*), Rainbow Trout, and Sea Lamprey (*Petromyzon marinus*) which have no conservation status (SNA) as they are not native to Ontario. During surveys completed in July 2021, fish were observed visually (i.e., Mottled Sculpin).

American Eel (*Anguilla rostrata*), an endangered species in Ontario, has been captured in Lake Ontario and also a section of Oshawa Creek north (upstream) of the Natural Environment Assessment Area (MNRF 2023b). As such it reasonable to assume that American Eel may occur in the reaches of Oshawa Creek in the Natural Environment Assessment Area. Within the Assessment Area, there are no records of American Eel in the NHIC database (MNRF 2023b).

Fish Habitat

At this WC, Oshawa Creek is within in a 100-150 m wide valley. East of the creek, the valley is steep and treed. West of the creek there is a municipal multi-use recreational trail in a park setting. The railway bridge spans the width of the active channel and part of the floodplain. The following fish habitat characteristics were noted at this WC:

- Moderate flow and normal stream stage conditions were observed on July 15, 2021, following dry conditions in the previous 24 hrs. Water was clear and without colour.
- In-stream cover was moderate (40-50%) and provided by undercut banks, deep pools, boulders, cobble, logs and branches along the shoreline.
- 40% of the banks were depositional, 30% were vulnerable, 25% were eroding, and 5% were protected by angular stone along the multi-use trail on the west side of the creek.
- Substrate was dominated by sand (33%) and silt (33%), followed by gravel (25%), cobble (8%) and boulders (1%).
- Morphology at this WC was 80% run, 10% riffle, and 10% pool.
- Stream dimensions - Wetted width: 8.4 - 13.7 m; Mean bankfull width: 17.6 – 17.7 m; Mean depth 36 cm; Maximum pool depth: 84 cm.
- Canopy was 90% open: 10% partly open
- Riparian vegetation within 5 m was treed valley and a multi-use trail in a park setting.
- Sorted substrates (i.e., cobble and gravel) provide suitable spawning substrates for certain fish species. The railway bridge spanning the channel does not pose a migratory obstruction for fish. No other migratory obstructions were observed.

Summary

Within the Natural Environment Assessment Area, Oshawa Creek provides direct coldwater fish habitat based on a review of MNRF records. CLOCA long-term water temperature monitoring indicates this reach provides coolwater habitat. There are no records of provincially or federally protected aquatic SAR. Records of American Eel in Oshawa Creek upstream and downstream of the Natural Environment Assessment Area suggest that this species also inhabits Oshawa Creek within the Assessment Area.

Harmony Creek – WC-3

Harmony Creek flows under the railway bridge between Harmony Road South and Bloor Street East. Within the Natural Environment Assessment Area, Harmony Creek is mapped as a warmwater watercourse (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station within this reach (the nearest station to the Project Footprint is CLOCA Station TLHA02 [within the Natural Environment Assessment Area]) and classifies this reach of Harmony Creek as coolwater habitat (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach four times between 2013 and 2016. In total 13 fish species were captured including Western Blacknose Dace, Creek Chub, Green Sunfish (*Lepomis cyanellus)*, Johnny Darter, Longnose Dace, Rainbow Darter (*Etheostoma caeruleum)*, Rainbow Trout, and White Sucker. These fish species have warmwater, coolwater and coldwater preferences (Coker et. al. 2001). Most fish species captured are common, widespread and abundant in Ontario (S5). Two (i.e., Green Sunfish and Rainbow Darter) are apparently secure, uncommon but not rare (S4). During surveys completed July 2021, fish were observed visually including Rainbow Trout (immature), Longnose Dace, Western Blacknose Dace, Johnny Darter. Rainbow Trout has no conservation status (SNA).

Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

Fish Habitat

At this WC, Harmony Creek is within a 75-125 m wide valley. East and west of the creek the valley is steep and treed. The railway bridge spans the width of the active channel and part of the floodplain. The following fish habitat characteristics were noted at this WC:

- Moderate flow and normal stream stage conditions were observed on July 15, 2021, following dry conditions in the previous 24 hrs. Water was clear and without colour.
- In-stream cover was moderate (40-50%) and provided by deep pools and boulders.
- 64% of the banks were eroding, 23% were depositional, and 13% were vulnerable.
- Substrate was dominated by sand (60%), followed by gravel (33%), cobble (4%) and boulders (3%).

- Morphology at this WC was 60% flat, 16% pool, 12% riffle, and 12% run.
- Stream dimensions - Wetted width: 3.1 - 8.7 m; Mean bankfull width: 9.9 – 11.4 m; Mean depth 19 cm; Maximum pool depth: 50 cm.
- Canopy was 45% open; 55% partly open.
- Riparian vegetation within 5 m of the stream was treed valley.
- Limited areas of sorted substrates (i.e., cobble and gravel) provide suitable spawning substrates for certain fish species. The railway bridge spanning the channel does not pose a migratory obstruction for fish. No other migratory obstructions were observed.

Summary

Within the Natural Environment Assessment Area, Harmony Creek provides direct warmwater fish habitat according to MNRF records. CLOCA long-term water temperatures monitoring indicates this reach provides coolwater habitat, however coldwater species such as Rainbow Trout have been recorded in Harmony Creek. There are no records of provincially or federally protected aquatic SAR.

Farewell Creek – WC-4

Farewell Creek flows under the railway between Harmony Road South and Bloor Street. Within the Natural Environment Assessment Area, Farewell Creek is mapped as a coldwater watercourse (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station within this reach (the nearest station to the Project Footprint is CLOCA Station TLFA02 [outside of the Natural Environment Assessment Area]) and classifies this reach of Farewell Creek as coolwater habitat (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach three times in 2013. In total, 13 fish species were captured including: Western Blacknose Dace, Bluntnose Minnow (*Pimephales notatus)*, Brown Bullhead (*Ameiurus nebulosus)*, Brown Trout, Creek Chub, Green Sunfish, Johnny Darter, Longnose Dace, Mottled Sculpin, Rainbow Darter, Rainbow Trout, Rock Bass (*Ambloplites rupestris*), and Round Goby (*Neogobius melanostomus*). These species represent warmwater, coolwater and coldwater preferences (Coker et. al. 2001) all occurring in the same system. Most fishes captured are common, widespread and abundant in Ontario (S5). Two species (i.e., Green Sunfish and Rainbow Darter) are apparently secure, uncommon but not rare (S4). Three species (i.e., Brown Trout, Rainbow Trout, and Round Goby) have SNA. During surveys completed in July 2021,

two fish species were observed visually including: Johnny Darter (YOY) and Creek Chub.

During spring, water depth was between 10 cm to 60 cm, with fast-moving and clear water. Water depth in summer was between 10 cm to 80 cm, with baseflow velocity and visually clear water.

Thirteen species of fish were captured in the spring survey, with Longnose Dace and Blacknose Dace as the most abundant at this location (collectively representing approximately 49% of the total catch). Nine species were captured in the summer survey, with Blacknose Dace and Rainbow Darter as the most abundant species (approximately 57% of the total catch).

Eight fish species captured are classified as cool water species (Coker et al. 2001). Four warm water species and one cold water species were captured which was Rainbow Trout (*Oncorhynchus mykiss*). Eight species captured are ranked by NHIC as S5 which indicates they are secure, common, widespread, and abundant in Ontario. Two species, Rainbow Darter (*Etheostoma caeruleum*) and Green Sunfish (*Lepomis cyanellus*), are ranked by NHIC as S4 which indicates they are apparently secure, uncommon but not rare with some cause for long-term concern due to declines or other factors. A conservation status rank does not apply (SNA) to three species because the species are not suitable targets for conservation activities. These are Goldfish (*Carassius auratus*), Rainbow Trout, and Round Goby (*Neogobius melanostomus*). Goldfish and Round Goby are considered invasive in Ontario. Rainbow Trout is valued by anglers as a game fish. The presence of juvenile Rainbow Trout indicates that Farewell Creek provides suitable conditions for spawning and rearing for this species. No fish species at risk (SAR) were captured.

Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

Fish Habitat

At this WC, Farewell Creek is within a 170-260 m wide valley. East and west of the creek the valley is moderately steep and treed. The railway crosses the watercourse over twin arches with closed bottom. Each arch is 4.2 m wide and 3.7 m high. The footing between the arches is 1.6 m wide. During normal flow conditions flow is diverted through the west arch. Wetted depth in the western arch was 55 cm. The following fish habitat characteristics were noted at this station:

- Moderate flow at 0.3 metres per second (m/s) and normal stream stage conditions were observed on July 14, 2021, following a period with thundershowers in the previous 24 hrs. Water was clear and without colour.

- In-stream cover was moderate (50%) and provided by deep pools, boulders, cobble, logs and branches, and overhanging vegetation.
- Most of the banks were eroding (55%), followed by vulnerable (35%); depositional (5%), and protected (5%).
- Substrate was dominated by cobble (65%), other substrates present were gravel (10%), sand (10%), silt (10%) and boulders (5%).
- Morphology was predominantly riffle (80%), with the remainder comprised of pool (10%) and run (10%).
- Stream dimensions - Wetted width: 5.9- 6.8 m; Mean bankfull width: 7.8 – 10.2 m; Mean depth 25 cm; Maximum pool depth: 68 cm.
- Canopy was almost entirely open (85%), and the remainder was partly open (15%).
- Riparian vegetation within 5 m of the stream was treed valley, (i.e., willow species and Black Walnut [*Juglans nigra*]).
- Limited areas of sorted substrates (i.e., cobble and gravel) provide suitable spawning substrates for certain fish species. The railway bridge spanning the channel does not pose a migratory obstruction for fish. No other migratory obstructions were observed.

Summary

This section of Farewell Creek provides direct coldwater fish habitat based on records provided by MNRF (2021a). CLOCA long-term water temperature monitoring indicates this reach provides coolwater habitat. There are no records of provincially or federally protected aquatic SAR.

Unnamed Tributary of Lake Ontario – WC-5a and WC-5b

Two unnamed tributaries of Lake Ontario flow under the railway approximately 365 m and 470 m west of Prestonvale Road. Tributary 5a is mapped without thermal classification south of the railway by MNRF (MNRF 2023a). The tributary at WC-5b is not mapped by MNRF (2023a). No water temperature data for these tributaries are available from CLOCA. These HDF were assessed as a headwater drainage features according to the criteria of the Evaluation, Classification and Management of Headwater Drainage Feature Guidelines (TRCA/CVC 2014)

Hydrology

On July 14, 2021, the watercourse was dry, and no flow was observed following a period with thundershowers in the previous 24 hours. On April 20, 2023, the poorly defined feature had minimal surface flow (<0.5 l/s). The feature had an average wetted width of 0.2 m and an average depth of 2 cm. The water temperature south of the railway was 9.5°C. Tributary 5b to the east also had minimal surface flow, with an average wetted width of 0.2 m and a maximum depth of 5 cm. On May 17, 2023, minimal surface flow was also observed with an average depth of 1 cm and an average wetted width of 0.2 m. A 1 m by 1 m pool of water was present south of the culvert; however, the downstream channel was dry with no flow. Some flow was observed in the secondary unmapped feature (WC-5b) although the flow was not continuous and had an average depth of 1 cm. On July 12, 2023, both features were observed to be dry with no pools or standing water. No fish habitat was present.

Based on these observations the classification for the hydrology function of the HDF at WC-5a and WC-5b within the CP Rail ROW is 'Valued or Contributing' in accordance with the HDF guidelines.

Riparian

North of the rail corridor the ELC communities are comprised largely of active agriculture (AG) and maintained lawn features. Small, disturbed pockets of mineral cultural thicket (CUT1), mineral cultural meadow (CUM1), and linear treed deciduous hedgerows (HE1) are also present representing current land disturbance. South of the railway the communities are comprised of a coniferous plantation (CUP3), mineral cultural meadow (CUM1), and mineral cultural thicket (CUT1).

Current land use that is occupied by infrastructure and active agricultural, suggests riparian habitat is limited at WC-5a and WC-5b. Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW was classified as 'Important', meaning the riparian corridor is dominated with thicket/scrubland communities as well as natural areas influenced by human activities such as plantations and regenerating woodlands.

Fish Community

There are no fish records available for WC-5a and WC-5b (MNRF 2023a; CLFN 2022; CLOCA 2021a).

No suitable fish habitat was present during field investigations on July 14, 2023, May 17, 2023, and July 12, 2023, as the channel was dry. On April 20, 2023, no fish were observed and use by fish was unlikely. This intermittent or ephemeral system may contain fish during seasonally wet periods.

Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

Fish Habitat

At WC-5a there is a poorly defined channel located within thicket communities to the north and the south of the railway. Twin 60 cm diameter corrugated steel pipe (CSP) culverts are in place under the railway. The culverts are perched on the south side with a height of 0.5 m and 0.25 m. The culverts convey drainage south from an HDF as well as drainage east and west from the railway crossing.

At WC-5b approximately 100 m east of WC 5b there are twin 60 cm CSP culverts, conveying drainage south from a thicket community adjacent to an agricultural field. South of the railway, the feature is poorly defined draining into a wetland thicket community with cattails, willows, and dogwood species.

No direct fish habitat is present within WC-5a and WC-5b. These features provide contributing fish habitat by supplying surface water and nutrients to McLaughlin Bay and Lake Ontario. Using the criteria of the HDF Guideline the fish and fish habitat functions of these features within the CP Rail ROW were classified as ‘Contributing’.

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary is likely to function as a movement corridor for small animals. The habitat available is unlikely to function as amphibian breeding habitat due to the fragmentation of the surrounding landscape and lack of connectivity between upstream and downstream habitat features. For example, active agriculture occurs north of WC-5a and WC-5b, while the railway is adjacent to the tributary, and Highway 401 is directly south of the feature. As such, the feature is unlikely to be used as a stepping-stone habitat for mobile amphibians but may be utilized by other small wildlife species.

Based on the criteria within the HDF Guidelines, terrestrial habitat functions within the CN ROW were classified as ‘contributing’, meaning the riparian habitat may not provide movement opportunities for amphibian species due to the absence of wetland habitat, but may provide a corridor for other terrestrial wildlife species.

Summary

This unnamed tributary provides contributing fish habitat only by supplying surface water to McLaughlin Bay / Lake Ontario. There are no records of provincially or federally protected aquatic SAR for this unnamed tributary. The tributaries do provide riparian and terrestrial functions that influence the decision-making process to arrive at a management option.

These unnamed tributaries are linked with the management option: 'Protection' using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014).

Robinson Creek – WC-6

Robinson Creek crosses the railway approximately 370 m east of Prestonvale Road. Within the Natural Environment Assessment Area, Robinson Creek is mapped as a warmwater watercourse (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station within this reach (the nearest station to the Project Footprint is CLOCA Station TLROB01 [outside of the Natural Environment Assessment Area]) and classifies this reach of Robinson Creek as coolwater habitat based on the most current monitoring data (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach nine times between 2011 and 2015. In total 13 fish species were captured including: Western Blacknose Dace, Brook Stickleback, Brown Bullhead, Creek Chub, Fathead Minnow, Green Sunfish, Johnny Darter, Largemouth Bass, Longnose Dace, Pumpkinseed, Threespine Stickleback (*Gasterosteus aculeatus)*, White Sucker, and Yellow Perch. These species represent a diversity of warmwater, coolwater and coldwater preferences. Most species captured are common, widespread and abundant in Ontario (S5). Threespine Stickleback is apparently secure, uncommon but not rare (S4). During surveys completed in July 2021, three fish species were observed visually including, Brown Bullhead, Creek Chub and Johnny Darter.

Five species were captured at this location during the spring survey. Creek Chub and Blacknose Dace were the most abundant and collectively represented approximately 90% of the total catch. Five species were captured at this location during the summer survey. However, Brown Bullhead, which were previously captured in the spring, were not captured in the summer survey. Pumpkinseed Sunfish were captured in the summer but not the spring. Creek Chub was the most abundant species in the summer (approximately 50% of the total catch) followed by Johnny Darter and Blacknose Dace.

Six species of fish were captured at this location in total during spring and summer sampling events. Three cool water species as well as three warm water species were captured (Coker et al. 2001). All six species captured are ranked by NHIC as S5 which indicates they are secure, common, widespread, and abundant in Ontario. Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

Fish Habitat

At this WC, Robinson Creek is within a 75-100 m wide valley. East and west of the creek, the valley is low gradient. North of the railway, the valley is vegetated by a meadow. South of the railway the vegetation includes thicket and meadow. Robinson Creek is diverted under the railway through a closed bottom arch culvert. The culvert is 2.3 m wide and 2.2 m high. Wetted depth in the culvert was 9 cm. Wetted width was 1.9 m. The following fish habitat characteristics were noted at this WC:

- Moderate flow and normal stream stage conditions were observed on July 14, 2021 following a period with thundershowers in the previous 24 hrs. Water was clear and without colour.
- In-stream cover is low (30%) and provided by deep pools, boulders, aquatic vegetation including Canada Waterweed, Watercress and overhanging terrestrial grasses and herbaceous vegetation.
- Most of the banks were protected (60%), followed by depositional (25%), and eroding (15%).
- Substrate was mostly silt (31%) and boulders (28%) followed by clay (21%), sand (15%) and gravel (5%).
- Morphology was predominantly run (63%), with the remainder comprised of pool (21%) and riffle (16%).
- Stream dimensions - Wetted width: 2.2 – 3.0 m; Mean bankfull width: 2.9 – 4.3 m; Mean depth 20 cm; Maximum pool depth: 52 cm.
- Canopy was almost entirely open (85%) and the remainder is partly open (15%).
- Riparian vegetation within 5 m of the stream includes meadow and thicket communities, terrestrial grasses and herbs overhanging the edge of the channel.
- No critical habitat for fish was observed. The arch culvert was perched by 27 cm and poses a barrier to upstream fish migration. No other migratory obstructions were observed.

Summary

This section of Robinson Creek provides direct warmwater fish habitat based on review of MNRF records. CLOCA long-term water temperature monitoring indicates this reach provides coolwater habitat, however coldwater species such as Rainbow Trout have been recorded in Robinson Creek. There are no records of provincially or federally protected aquatic SAR.

Unnamed Tributary of Tooley Creek (West of Courtice Road) – WC-7

The unnamed tributary Tooley Creek flows under the railway approximately 360 m west of Courtice Road. Within the Project Footprint there is no mapped drainage feature (MNRF 2023a). A coldwater watercourse is mapped starting more than 300 m south of the railway alignment, south of Baseline Road. No water temperature data for this tributary was available from CLOCA. This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014).

Hydrology

On July 16, 2021 trickle flow was observed at the south side of the agricultural field north of the rail following a period with thundershowers in the previous 24 hours. Water was clear and colourless.

On April 12, 2022 trickle flow was observed in a 5 m section in the north side of the agricultural field where this drainage feature emerges. No defined channel or flow was observed in the remainder of this drainage feature. The drainage feature is densely vegetated by grasses.

On May 24, 2022 no flow was observed in the north end of this feature or throughout most of this feature within the agricultural field. A trickle of flow was observed from the SWM pond located adjacent to the existing Courtice GO Station bus terminal parking lot.

Based on these observations the classification for the hydrology function of WC-7 within the Courtice Road (B3 Courtice) GO Station property is 'Valued' or 'Contributing' in accordance with the TRCA and CVC (2014) guidelines.

Riparian Vegetation

The HDF traverses the meadow west of Courtice Road (B3 Courtice) GO Station and a thicket north of the railway.

Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW is classified as 'Important'.

Fish Community

There are no fish records for this tributary by MNRF (2023a), CLFN (2022), or CLOCA (2021a). The channel was dry during surveys completed in July 2021.

Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

This HDF originates in the northern part of the lands west of the existing Courtice GO Station bus terminal. There is no channel in the lands to the north of the Courtice Road (B3 Courtice) GO Station property. Within the property this drainage feature can be characterized as a swale or a shallow trough like depression. It is up to 10 m wide and approximately 0.5 m deep. It is densely vegetated by grasses and no defined channel was observed.

Fish Habitat

A stormwater treatment facility (i.e., stormwater management [SWM] pond) located in the southwest corner of the Courtice GO Station bus terminal contributes flow to this HDF.

At the south end of the property there is an actively eroding gully with a knick-point where the channel drops by approximately 0.5 m.

The HDF continues as a poorly defined channel through a thicket north of the rail corridor towards an open bottom arch CSP culvert. The existing culvert is 1 m tall and 1.1 m wide. South of the rail corridor there is a constructed ditch which is 3.3 m wide through a hedgerow approximately 12 m wide. The ditch empties into a 60 cm diameter CSP which diverts water under the industrial property to the south.

Using the criteria of the HDF Guideline the fish and fish habitat functions of this feature within the CP Rail ROW were classified as ‘Contributing’.

Terrestrial Habitat

No amphibians were observed in the CP Rail ROW during surveys completed in 2021. The feature likely functions as a movement corridor for more mobile non-amphibian species.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Natural Environment Assessment Area is classified as ‘Valued’, meaning that wetland habitat occurs but amphibian breeding is absent.

Summary

This unnamed tributary provides contributing fish habitat only by supplying surface water to Tooley Creek. There are no records of provincially or federally protected aquatic SAR for this unnamed tributary. The tributary does provide riparian and terrestrial functions that influence the determination of the appropriate management option.

This unnamed tributary is linked with the management option: 'Protection' using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014).

Tooley Creek – WC-8

Tooley Creek flows under the railway approximately 290 m east of Courtice Road. Within the Natural Environment Assessment Area, Tooley Creek is mapped as a cool water watercourse (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLTY04 [within the Natural Environment Assessment Area]) and classifies this reach of Tooley Creek as coolwater habitat (CLOCA 2021a).

Fish Community

Fish records maintained by MNRF (2023a), CLFN (2022), and CLOCA (2021a) were reviewed. CLOCA sampled this reach nine times between 2011 and 2015. In total 16 fish species were captured including: Western Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Brown Bullhead, Common Carp (*Cyprinus carpio)*, Creek Chub, Fathead Minnow, Green Sunfish, Johnny Darter, Largemouth Bass (*Micropterus salmoides*), Northern Redbelly Dace (*Chrosomus eos*), Pumpkinseed, Rainbow Trout, Threespine Stickleback, White Sucker, and Yellow Perch (*Perca flavescens*). These species have warmwater and coolwater preferences. Most fishes captured are common, widespread and abundant in Ontario (S5). Two species (i.e., Green Sunfish and Threespine Stickleback) are apparently secure, uncommon but not rare (S4). Two species (i.e., Rainbow Trout and Common Carp) have no conservation status (SNA). During surveys completed in July 2021 one species was observed visually (i.e., Brook Stickleback).

Seven species were captured at this location in the spring, with Fathead Minnow the most abundant species (approximately 53% of the total catch). Eleven species were captured at this location in the summer. White Sucker was the most abundant species (38% of the total catch), which were mostly young of the year (YOY).

Nine species were captured at this location in total during spring and summer 2023 sampling events. Five species are classified as cool water species (Coker et al. 2001). Three are warm water species and one is a coldwater species which was Rainbow Trout. Most (7 of 9) fish species captured are ranked by NHIC as S5 which indicates they are secure, common, widespread, and abundant in Ontario. As previously mentioned, Green Sunfish are ranked by NHIC as S4. A conservation status rank does not apply to one species which is Rainbow Trout. The presence of juvenile Rainbow Trout and White Sucker (*Catostomus commersonii*) indicates that Tooley Creek provides suitable conditions for spawning and rearing for this species. A previous record

for Rainbow Trout in Tooley Creek was in 2015 (CLOCA 2022). No fish SAR were captured at WC-8.

Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

Fish Habitat

At this WC, Tooley Creek is within a 150-200 m wide valley. East and west of the creek, the valley is low gradient. North of the railway, the valley is vegetated by thicket west of the creek, and agricultural crops east of the creek. South of the railway, the vegetation includes thicket and meadow. Robinson Creek is diverted under the railway through a large, closed bottom arch culvert. The culvert is 3.1 m wide and 3.0 m high. Wetted width through the culvert was 2.1 m. Wetted depth in the culvert was 14 cm. Wetted width was 1.9 m. The following fish habitat characteristics were noted at this WC:

- Moderate flow and normal stream stage conditions were observed on July 13, 2021, following a period without precipitation in the previous 24 hours. Water was clear and without colour.
- In-stream cover was low (15%) and provided by a deep pool, sparse boulders, cobbles, and large organic debris.
- Most of the banks were eroding (37%), followed by depositional (25%), protected (25%) and the remainder was vulnerable (13%).
- Substrate was mostly detritus (40%), followed by cobble (30%), silt (15%), gravel (10%) and sand 5%.
- Morphology was predominantly riffle (50%), with the remainder comprised of pool (25%) and run (25%).
- Stream dimensions - Wetted width: 1.0 – 2.3 m; Mean bankfull width: 3.0 – 3.3 m; Mean depth 20 cm; Maximum pool depth: 70 cm.
- Canopy was almost entirely open (60%), and the remainder was partly open (40%).
- Riparian vegetation within 5 m of the stream included grasses and herbaceous vegetation, trees and shrubs (forested).
- Limited areas of sorted substrates (i.e., cobble and gravel) provide suitable spawning substrates for certain fish species. The arch culvert is not perched. No migratory obstructions were observed.

Summary

This section of Tooley Creek provides direct coldwater fish habitat based on review of both MNRF and CLOCA records. Coldwater species such as Rainbow Trout have been recorded in Tooley Creek. As there are no recent fish community records for this reach, if in-water work is expected, the fish community should be confirmed through a multi-season (i.e., spring and summer) fish survey during detailed design. There are no records of provincially or federally protected aquatic SAR for this reach of Tooley Creek.

Unnamed Tributary of Tooley Creek (North of Baseline Road West) – WC-9

An unnamed tributary of Tooley Creek flows under the rail corridor approximately 120 m north of Baseline Road West. Within the Natural Environment Assessment Area, this tributary is mapped as a coolwater watercourse (MNRF 2023a). This tributary is not mapped as a classified drain (MNRF 2023b). CLOCA has completed long-term water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLTY03 [outside of the Natural Environment Assessment Area]) and classifies this reach of Tooley Creek as coolwater habitat (CLOCA 2021a). This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014).

Hydrology

On July 14, 2021, trickle flow was observed following a period of dry hot humid weather. The water temperature was 15.7°C. No instream cover was present for fish at the time of surveys.

On April 20, 2023, the feature was observed to be flowing with a slow velocity. The feature had an average wetted width of 0.3-2 m with a maximum pool depth of 0.3 m at the south (downstream) culvert outlet. The water temperature was 7.3°C.

On May 18, 2023, the feature was observed to have trickle flow. A stagnant pool with a biofilm layer was present at the culvert with a maximum depth of 0.3 m. Shallow isolated pools were also observed in a poorly defined swale/wetland. The average depth of the feature was 3 cm and the wetted width ranged from 0.1-1.5 m. The water temperature was 11.5°C. No fish were captured during the surveys, and the feature is unlikely to support direct be fish habitat.

On July 10, 2023, no flow was present; a dry channel with damp soils and mosses throughout was observed. A 1 m wide pool of stagnant water was present at the culvert south of the railway. The water temperature was 14.2°C.

Using the criteria of the HDF Guidelines the hydrology function of the HDF at WC-9 within the CP Rail ROW was classified as 'Important'.

Riparian Vegetation

North of the railway the vegetation communities were comprised of many small pockets of cultural influence such as active agriculture, roadways, mineral cultural thickets (CUT1), mineral cultural woodland (CUW1), and mineral cultural meadows (CUM1). The watercourse feature runs throughout a larger deciduous swamp (SWD) community.

South of the railway the vegetation communities were also comprised of small pockets that are a result of cultural influence and include mineral cultural thicket (CUT1), mineral cultural woodlands (CUW1), deciduous forest (FOD), and a deciduous swamp (SWD). Commercial land use was also present immediately south of the railway.

The adjacent riparian corridor was vegetated. Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW is classified as 'Important', meaning the riparian corridor is dominated with thicket/scrubland communities as well as natural areas influenced by human activities such as plantations and regenerating woodlands.

Fish Community

There are no fish records for this tributary from MNRF (2023a), CLFN (2022) or CLOCA (2021a).

During field investigations, no fish were visually observed on July 13, 2021, April 20, May 18, or July 12, 2023. No fish were captured during fish community surveys on May 18, 2023, and suitable fish habitat was not present on July 12, 2023 to conduct further assessments.

Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

Fish Habitat

At WC-9, there is a poorly defined channel in the thicket communities to the north and the south of the rail corridor. A round 0.5 m CSP culvert is in place under the railway at the north of the rail corridor. South of the rail corridor, a 1 m CSP exits with a 45-degree angle. The culvert crossing appears to have been previously redirected.

This tributary of Tooley Creek provides coolwater fish habitat based on a review of both MNRF and CLOCA records. There are no records of provincially or federally protected aquatic SAR. Based on field investigations, the tributary may provide fish habitat at

times of high flow; however, no fish were captured or observed during the survey. The feature likely functions as contributing fish habitat, conveying drainage to Tooley Creek.

Using the criteria of the HDF Guideline the fish and fish habitat function of this feature within the CP Rail ROW is classified as 'Contributing'.

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary likely functions as general amphibian habitat as there is a vegetation community of deciduous swamp immediately south of the railway as well as north of the Study Area outside of the CP Rail ROW. The feature, therefore, may provide a stepping-stone habitat between these areas. No amphibians were observed in the CP Rail ROW during surveys completed in 2021. The feature likely also functions as a movement corridor for more mobile non-amphibian species.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Study Area is classified as 'Valued', meaning that wetland habitat occurs but amphibian breeding is absent.

Summary

This tributary of Tooley Creek provides coolwater fish habitat based on review of both MNRF and CLOCA records. There are no records of provincially or federally protected aquatic SAR for this unnamed tributary of Tooley Creek. The tributary does provide hydrological, riparian and terrestrial functions that influence the determination of the appropriate management option.

This unnamed tributary is linked with the management option: 'Protection' using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014).

Unnamed Tributary of Darlington Creek (South of Baseline Road West) – WC-10

An unnamed tributary of Darlington Creek flows under the railway approximately 50 m south of Baseline Road West. Within the Natural Environment Assessment Area, this tributary is mapped as a warmwater watercourse (MNRF 2023a). CLOCA has completed water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLDN05 [inside of the Natural Environment Assessment Area]) and classifies this reach of Darlington Creek as coolwater habitat (CLOCA 2021a). This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014).

Hydrology

On July 12, 2021, trickle flow was observed with an approximate depth of 2 cm within the culvert at the crossing. Filamentous algae was present. North of the rail corridor at the Baseline Road culvert, trickle flow was observed with an average depth of 8 cm and an average wetted width of 0.6 m.

On April 20, 2023, the feature was observed to be flowing north from a pooled area at the southern agricultural field. The maximum depth in the channel was 0.1 m. A larger pooled area was also present north of the rail corridor before Baseline Road, with a maximum depth of 0.15 m. The water temperature was 6.9°C. On May 18, 2023, the feature had trickle flow and an isolated pool before Baseline Road. The feature had an average wetted width of 0.10 m and an average depth of 5 cm. The water temperature was 13.8°C.

On July 12, 2023, the feature was dry, and no standing pools or flows were present at the railway crossing. The substrates were damp, and algae was present on the surface. A small amount of standing water was present under the culvert at Baseline Road.

Using the criteria of the HDF Guidelines the hydrology function of this feature within the CP Rail ROW were classified as ‘Important’.

Riparian Vegetation

North of the rail corridor the vegetation communities within the riparian zone of the tributary were comprised of treed deciduous hedgerow (HE1), cultural deciduous thicket (CUT), and reed-canary grass meadow marsh (MAM2-2). South of the railway, the vegetation communities in the riparian zone consisted of cultural meadow (CUM1), cultural coniferous plantation (CUP3), and active agricultural lands.

Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW is classified as ‘Important’, meaning the riparian corridor is dominated with thicket/scrubland communities as well as natural areas influenced by human activities such as plantations and meadows.

Fish Community

This unnamed tributary of Darlington Creek provides direct warmwater fish habitat, according to MNRF (2023a) records. CLOCA long-term water temperature monitoring indicates this reach provides coolwater fish habitat. One species of fish, Brook Stickleback, has been reported by CLOCA (2021a). There are no records of provincially or federally protected aquatic SAR for this unnamed tributary of Darlington Creek.

During field investigations, no fish were observed on July 12, 2021, April 20, or May 18, 2023. No fish were captured during fish community surveys on May 18, 2023, and suitable fish habitat was not present on July 12, 2023, to conduct a fish community assessment.

Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

Fish Habitat

A poorly defined channel was observed draining north at this WC-10 in a meadow vegetation community, with cattails at the beginning of the feature. No channel was visible in the cropped agricultural field to the south of the rail corridor. A concrete open-bottom culvert is in place under the railway that is 1 m wide and 0.5 m tall. North of the railway, this tributary is diverted under Baseline Road through a 60 cm diameter round CSP culvert.

Using the criteria of the HDF Guidelines the fish and fish habitat functions within the CP Rail ROW were classified as ‘Important’ due to the presence of fish as documented by CLOCA (2021).

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary is likely to function as general amphibian habitat as wetland habitat is present upstream and downstream of WC-10 in meadow marsh (MAM2-2) and deciduous thicket swamp (SWT) where amphibians were observed outside of the CP Rail ROW. The feature may provide a stepping-stone habitat between these areas; however, there is low potential for this to occur as the transportation corridors of Rundle Road, Baseline Road, and the railway intersect the two wetland habitats and tributary. No amphibians were observed in the CP Rail ROW during surveys completed in 2021; however, individuals of Green Frog, Spring Peeper, and American Toad were heard approximately 130 m southwest of WC-10 in the deciduous thicket swamp. The feature likely also functions as a movement corridor for more mobile non-amphibian species.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Study Area is classified as ‘Important’, meaning that wetland habitat occurs, and amphibian breeding is present within 400 m.

Summary

At WC-10 unnamed tributary of Darlington Creek provides direct fish habitat. CLOCA long-term water temperature monitoring indicates this reach provides coolwater fish habitat.

This unnamed tributary is linked with the management option: 'Protection' using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014).

Darlington Creek – WC-11

Darlington Creek flows generally from west to east in this area and is located close to or in the ROW of the rail corridor and/or Baseline Road West. The creek appears to have been realigned in sections. A culvert diverts flow under both the railway and Baseline Road West. There are two other crossings of Baseline Road West in this 300 m stretch of the road. At WC-11, Darlington Creek is mapped as a warmwater watercourse (MNRF 2023a). CLOCA has completed water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLDN05 [within the Natural Environment Assessment Area]) and classifies this reach of Darlington Creek as coolwater habitat (CLOCA 2021a).

Fish Community

There are no recent records (<10 years) for this reach available from the MNRF (2023a), CLFN (2022), and CLOCA (2021a). In 2015 CLOCA surveyed a reach approximately 2.5 km downstream of the Natural Environment Assessment Area. In total, six fish species were captured including: Brook Stickleback, Creek Chub, Green Sunfish, Largemouth Bass, Rainbow Trout, and White Sucker. These species have warm, cool, and coldwater thermal preferences. Most species are common, widespread and abundant in Ontario (S5). Rainbow Trout has SNA as this species is not native to Ontario. No fish were observed visually during the aquatic habitat survey completed on July 13, 2021.

Five species were captured at this location in spring 2023. Brook Stickleback was the most abundant species (approximately 43% of total catch). Three species were captured at this location in summer 2023. Brook (young of the year) made up 93% of the total catch.

Six fish species were captured at this location in 2023. Four fish species documented at this location are classified as cool water species (Coker et al. 2001). One cold water species (Rainbow Trout) was documented and one warm water species (Sunfish). Four fish species captured are ranked by NHIC as S5, which indicates they are secure, common, widespread, and abundant in Ontario. A conservation status rank does not apply (SNA) to one species which is Rainbow Trout. The presence of mature Rainbow Trout in the Natural Environment Assessment Area indicates that this species successfully migrates upstream from Lake Ontario to the upper reaches of this watershed to spawn. There were no previous observations of Rainbow Trout in the records reviewed. No fish SAR were captured.Four fish species documented at this

location are classified as cool water species (Coker et al. 2001). One cold water species (Rainbow Trout) was documented. Four fish species are ranked by NHIC as S5 which indicates they are secure, common, widespread, and abundant in Ontario. A conservation status rank does not apply (SNA) to one species which is Rainbow Trout. The presence of mature Rainbow Trout in the Study Area indicates that this species successfully migrates upstream from Lake Ontario to the upper reaches of this watershed to spawn.

Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

Fish Habitat

North of the railway (and Baseline Road West) the channel is in a 25-35 m wide valley that is vegetated by meadow community. The creek is diverted under the railway and Baseline Road West through a closed bottom box culvert that is 1.8 m wide and 1.4 m tall. The north side of the culvert connects to a concrete closed bottom channel that is also 1.8 m wide and 6.5 m long. South of the railway (and Baseline Road West), there is an open natural channel that loops back north and connects to another culvert under Baseline Road West. This culvert is a 2.0 m diameter round CSP culvert that is embedded in the substrate and not a permanent barrier to fish migration. Water depth in the culvert was 60 cm and fish were observed visually on June 3, 2021. The channel continues east within the rail ROW for approximately 240 m. The channel enters a wooded area that is approximately 50 m wide and turn south and away from the railway towards Baseline Road West. There is a concrete open box culvert at this location that had standing water but no flow on July 12, 2021. The culvert is 1.4 m wide and 1.1 m tall. No defined channel was observed north of this culvert in the cropped agricultural field. The following fish habitat characteristics were noted at this WC:

- Moderate flow and normal stream stage conditions were observed on July 12, 2021 following a period without precipitation in the previous 24 hours. Water was clear and without colour.
- In-stream cover was low (15%), and provided by small organic debris such as twigs, branches and terrestrial overhanging vegetation.
- The banks were depositional (100%).
- Substrate was mostly silt (80%), followed by clay (20%).
- Morphology was mostly run (75%), with the remainder comprised of riffles (10%), flat (10%) and pool (5%).

- Stream dimensions - Wetted width: 1.5 m; Mean bankfull width: 2.6 m; Mean depth 16 cm; Maximum pool depth: 20 cm.
- Canopy was almost entirely open (90%) and the remainder was partly open (10%).
- Riparian vegetation within 5 m of the stream included grasses and herbaceous vegetation, vines and shrubs. Vegetation adjacent to the Creek appeared to be trimmed for routine railway maintenance.

Summary

This reach of Darlington Creek provides direct warm water fish habitat according to MNRF records. CLOCA long-term water temperature monitoring shows that this reach provides coolwater fish habitat, however coldwater species such as Rainbow Trout have been recorded in Darlington Creek. There are no records of provincially or federally protected aquatic SAR in Darlington Creek.

Unnamed Tributary of Darlington Creek (East of Holt Road) – WC-12

WC-12 was at the existing railway crossing over an unnamed tributary of Darlington Creek 50 m east of Holt Road. At WC-12, this tributary is mapped as a warmwater watercourse (MNRF 2021a). CLOCA has completed long-term water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLDN01 [outside the Natural Environment Assessment Area]) and classifies this reach of Darlington Creek as coolwater habitat based on the most current monitoring data (CLOCA 2021a). This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014).

Hydrology

On July 13, 2021, slow water velocity and normal stream stage conditions were observed following a period without precipitation in the previous 24 hours. The feature had an average wetted width of 1.6 m, an average depth of 0.2 m and a maximum pool depth of 0.6 m. The water was clear and without colour. The water temperature was 17.3°C.

On April 20, 2023, moderate water velocity and normal stream stage conditions were observed. The feature had a wetted width ranging from 1-7 m with a maximum pool depth at the culvert of 0.65 m (0.2 m max. otherwise). An agriculture tile drain outlet was actively flowing from placed cobbles by the northeast field. The water was clear and without colour. The water temperature was 6.5°C. On May 24, 2023, the feature was flowing with an average depth of 0.2 m and a maximum depth of 1.3 m at the culvert

outlet. The feature had a vegetated island with a flowing channel on either side, each with a 1 m wetted width. In-situ water quality parameters were collected.

On July 12, 2023, the feature was dry with no flow, isolated pools were present upstream (north) with an average depth of 5 cm. A large volume of stagnant water was present within the culvert.

Using the criteria of the HDF Guidelines the hydrology function within the Study Area was classified as ‘Important’.

Riparian Vegetation

North and south of the rail corridor the vegetation communities were mainly comprised of willow mineral deciduous swamp (SWD4-1) surrounded by active agriculture (AG). A mineral cultural meadow (CUM1) was also present northwest of Holt Road.

Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW is classified as ‘Important’ as the riparian corridor is dominated with wetlands.

Fish Community

There are no recent (<10 years) fish records available for this tributary (MNRF 2023a, CLFN 2022, CLOCA 2021a).

During field investigations, no fish were observed on July 13, 2021, April 20, May 24 or July 12, 2023. No fish were captured during the survey on May 24, 2023, and suitable fish habitat was not present on July 12, 2023, to conduct further assessments.

Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

Fish Habitat

This reach of Darlington Creek provides direct warmwater fish habitat according to MNRF records. CLOCA long-term water temperature monitoring shows that this reach provides coolwater fish habitat.

North of the rail corridor, the creek is a 30 m wide valley dominated by a thicket community. The creek is diverted under the railway through an open-bottom concrete arch culvert that is 1.2 m high and 1.2 m wide. The culvert is not a barrier to upstream fish migration. South of the rail corridor the creek continues in a 30 m wide valley with deciduous forest vegetation.

Using the criteria of the HDF Guidelines the fish and fish habitat function of this unnamed tributary of Darlington Creek at WC-12 within the Natural Environment Assessment Area was classified as ‘Contributing’.

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary is likely to function as general amphibian habitat as there are vegetation communities of willow deciduous swamp immediately south and north of the railway. The feature also connects to Darlington Creek 250 m south of the railway. Amphibian surveys completed in 2021 at WC-12 did not detect any evidence of breeding amphibians. However, this feature may function as a movement corridor for other mobile non-amphibian species.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Natural Environment Assessment Area is classified as ‘Valued’, meaning that wetland habitat occurs but amphibian breeding is absent.

Summary

This unnamed tributary of Darlington Creek provides direct warm water fish habitat according to MNRF records. CLOCA long-term water temperature monitoring shows that this reach provides coolwater fish habitat. There are no records of provincially or federally protected aquatic SAR in Darlington Creek. The tributary does provide hydrological, riparian and terrestrial functions that influence the determination of the appropriate management option.

This unnamed tributary is linked with the management option: ‘Protection’ using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014).

Unnamed Tributary of Darlington Creek (East of Holt Road) – WC-13

WC-13 was at the existing railway crossing over an unnamed tributary of Darlington Creek 390 m east of Holt Road. At Station 13, this tributary is mapped as a warmwater watercourse MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLDN01 [outside the Natural Environment Assessment Area]) and classifies this reach of Darlington Creek as coolwater habitat based on the most current monitoring data (CLOCA 2021a). This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014).

Hydrology

On July 13, 2021, slow water velocity and normal stream stage conditions were observed following a period without precipitation in the previous 24 hours. The water was clear and without colour. The water temperature was 18.0°C.

On April 20, 2023, the feature was moderately flowing. The average wetted width ranged from 1 to 3.5 m, the average depth was 5 cm. A large pool was present south (downstream) of the rail corridor with a maximum depth of 1 m and the top of the culvert was submerged below the surface of the water by 0.1 m. Brown algae and sparse watercress were present. The water temperature was 6.5°C.

On May 25, 2023, the feature was flowing with a wetted width ranging from 0.2 to 2.5 m and a depth ranging from 0.1 to 1.5 m (max depth at culvert north and south of the railway). The water temperature was 10.1 °C. On July 12, 2023, the channel was dry with no flow. A pool at the south of the culvert crossing measured 2.5 m wide by 3.5 m in length, with a maximum depth of 0.4 m.

Using the criteria of the HDF Guidelines the hydrology function within the Study Area was classified as ‘Important’.

Riparian Vegetation

North of the rail corridor the vegetation communities are comprised of active agriculture (AG), a treed deciduous hedgerow (HE1), and a mineral cultural thicket (CUT1). South of the railway, the communities are mainly comprised of deciduous forest (FOD) and active agriculture (AG).

Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW was classified as ‘Important’, meaning the riparian corridor is dominated with forests and thicket/scrubland communities.

Fish Community

There are no recent (<10 years) fish records available for this tributary (MNRF 2023a, CLFN 2022, CLOCA 2021a). There are no records of provincially or federally protected aquatic SAR in Darlington Creek.

On May 25, 2023, three fish species were captured: Brook Stickleback (*Culaea inconstans*), Johnny Darter and Sunfish (immature). Suitable fish habitat was not present on July 12, 2023, to conduct further assessments.

Two fish species documented at this WC-13 are classified as cool water species, Brook Stickleback and Johnny Darter (Coker et al. 2001), while one species is warmwater, sunfish YOY. Two fish species are ranked by NHIC as S5 which indicates they are

secure, common, widespread, and abundant in Ontario. The sunfish YOY were not ranked as the species could not be confirmed during sampling.

Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

Fish Habitat

North of the rail corridor, the creek is a 20 m wide valley dominated by meadow and thicket communities. Adjacent land use is comprised of cropped agricultural fields. The creek is diverted under the railway through an open-bottom concrete arch culvert that is 0.8 m high and 1 m wide. The culvert is likely a barrier to upstream fish migration due to the incline of the culvert and shallow water conditions in the culvert. South of the rail corridor, the creek continues in a 40 m wide valley with deciduous forest vegetation.

Using the criteria of the HDF Guidelines, the fish and fish habitat functions of this unnamed tributary of Darlington Creek (WC-13) within the Natural Environment Assessment Area were classified as ‘Important’.

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary is likely to function as a stepping-stone amphibian habitat for mobile amphibians as there is an online pond approximately 500 m north of the railway crossing. The feature also connects directly to Darlington Creek approximately 1 km south of the rail crossing, and a forested area approximately 500 m south of the ROW. No amphibians were observed in the CP Rail ROW at WC-13 during surveys completed in 2021. The feature likely also functions as a movement corridor for other mobile non-amphibian species as well.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Natural Environment Assessment Area was classified as ‘Valued’, meaning that wetland habitat occurs but amphibian breeding is absent.

Summary

This unnamed tributary of Darlington Creek provides direct warm water fish habitat according to MNRF records. CLOCA long-term water temperature monitoring shows that this reach provides coolwater fish habitat. There are no records of provincially or federally protected aquatic SAR in Darlington Creek. The tributary does provide hydrological, riparian and terrestrial functions that influence the determination of the appropriate management option.

This unnamed tributary is linked with the management option: 'Protection' using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014).

Unnamed Tributary of Darlington Creek (East of Maple Grove Road) – WC-14

WC-14 was at the existing railway crossing over an unnamed Tributary of Darlington Creek 215 m east of Maple Grove Road. At WC-14 this tributary is mapped as a warmwater watercourse (MNRF 2023a). CLOCA has completed long-term water temperature monitoring at a station in this reach (the nearest station to the Project Footprint is CLOCA Station TLDN02 [outside of the Natural Environment Assessment Area]) and classifies this reach of Darlington Creek as coldwater habitat based on the most current monitoring data (CLOCA 2021a). This feature was assessed as a headwater drainage feature according to the criteria of the *Evaluation, Classification and Management of Headwater Drainage Feature Guidelines* (TRCA/CVC 2014).

Hydrology

On July 12, 2021, moderate water velocity and normal stream stage conditions were observed following a period without precipitation in the previous 24 hours. The water was clear and without colour. The stream had a wetted width of 1.4 m, an average depth of 0.1 m and a maximum pool depth of 0.3 m. The water temperature was 21.5°C.

On April 20, 2023, the feature was flowing well. The stream had an average wetted width of 2.5 m and a maximum pool depth of 0.35 m. Algae was present within the feature. The water temperature was 10.1°C.

On May 26, 2023, the stream continued to flow with an average depth of 0.5 m (0.1-0.7 m) and had a wetted width ranging from 1 to 2 m. The water temperature was 11.1°C.

July 12, 2023, both the upstream and downstream channels were dry and without flow. A stagnant standing pool of water was present on the south of the culvert (downstream), with a maximum depth of 0.2 m. A secondary pool was present south of the rail corridor, with a wetted width of 2.5 m by 3.5 m and a maximum depth of 0.40 m. The soils of the channel were damp, and the channel had moss growing throughout.

Using the criteria of the HDF Guidelines the hydrology function within the Natural Environment Assessment Area was classified as 'Important'.

Riparian Vegetation

North of the rail corridor the vegetation communities within the riparian zone of the tributary were comprised of deciduous swamp (SWD) adjacent to moist graminoid

meadow (CUM1-b), and active agriculture (AG). South of the rail corridor, the vegetation communities within the riparian zone of the tributary were also comprised of deciduous swamp (SWD) adjacent to a green ash deciduous swamp (SWD2-2) on the east side followed by active agriculture (AG) on the west side.

Based on the criteria within the HDF Guidelines, riparian function within the CP Rail ROW is classified as 'Important' as the riparian corridor is dominated with wetlands.

Fish Community

There are no recent (<10 years old) fish records available for this tributary (MNRF 2023a, CLFN 2022, CLOCA 2021a).

During field investigations, no fish were observed on July 13, 2021, nor April 20 or July 12, 2023. During fish community surveys on May 26, 2023, one fish species, Creek Chub (*Semotilus atromaculatus*), was captured. Suitable fish habitat was not present on July 12, 2023 to conduct further assessments.

Creek Chub is classified as a cool water species (Coker et al. 2001). This species is ranked by NHIC as S5 which indicates they are secure, common, widespread, and abundant in Ontario.

Within the Natural Environment Assessment Area, there are no records of provincially or federally protected aquatic SAR.

Fish Habitat

This reach of Darlington Creek provides direct warmwater fish habitat, according to MNRF records. CLOCA long-term water temperature monitoring indicates this reach provides coldwater fish habitat. There are no records of provincially or federally protected aquatic SAR in Darlington Creek.

North of the rail corridor, this creek is a 40 m wide valley dominated by meadow and thicket communities. Adjacent land use is comprised of cropped agricultural fields. There is a large (11,750 m^2) online pond approximately 225 m north of the rail corridor. The creek is diverted under the railway through an open-bottom concrete arch culvert that is 1.7 m high and 2.0 m wide. The culvert is likely a barrier to upstream fish migration due to the incline of the culvert and shallow water conditions in the culvert. South of the rail corridor, the creek continues in an 80 m wide valley with deciduous forest vegetation. Riparian vegetation within 5 m of the stream includes mature deciduous trees and shrubs, grasses and herbaceous vegetation, and mature trees (i.e., willow (Salix spp.) species).

Using the criteria of the HDF Guidelines, the fish and fish habitat functions of this unnamed tributary of Darlington Creek (WC-14) within the Natural Environment Assessment Area was classified as 'Valued'.

Terrestrial Habitat

The terrestrial habitat available within the riparian area of the tributary is likely to function as general amphibian habitat as there are vegetation communities of deciduous swamp wetlands immediately north and south of the rail corridor. The feature also contains a large, pond approximately 250 m north of the ROW as well as connects to Darlington Creek approximately 250 m south of the rail corridor. No amphibians were observed in the CP Rail ROW at WC-14 during surveys completed in 2021.

The feature likely functions as a movement corridor for other mobile, non-amphibian species as there is a continuous forested area south of the railway that may facilitate wildlife movement toward Darlington Creek.

Based on the criteria within the HDF Guidelines, terrestrial habitat function within the Study Area is classified as 'Valued', meaning that wetland habitat occurs but amphibian breeding is absent.

Summary

This unnamed tributary of Darlington Creek provides direct warm water fish habitat according to MNRF records. CLOCA long-term water temperature monitoring indicates this reach provides coldwater fish habitat. There are no records of provincially or federally protected aquatic SAR in Darlington Creek. The tributary does provide hydrological, riparian and terrestrial functions that influence the determination of the appropriate management option.

This unnamed tributary is linked with the management option: 'Protection' using the value assigned to each criterion and the flowchart available in the HDF Guidelines (CVC/TRCA 2014).

4.1.2 Terrestrial Environment

The Natural Environment Assessment Area is located partially within an urban environment comprised of residential, commercial and recreational properties in Oshawa and Bowmanville and partially within a rural environment comprised of agricultural fields, rural residences and light industry. Greater than 50% of the Project Footprint (~54%) and adjacent lands (~57%) were determined to be developed (i.e., building or road developments, asphalted lands or otherwise non-vegetated areas). Developed lands included residential developments, mixed-use developments, as well as commercial and industrial areas.

Where vegetation was found on properties with existing developments, vegetation was often limited to hedgerows between properties or along fence lines, manicured lawns, landscaped gardens / features and planted (streetscaping, boulevard or otherwise) trees. Undeveloped lands were classified into vegetation types in accordance with ELC standard procedures and protocols, as described below in Table 4.1.

Natural vegetation features throughout the Natural Environment Assessment Area show signs of disturbance with an abundance of invasive species including Common Reed (*Phragmites* sp.) and European Swallowwort, also known as Dog-strangling Vine, (*Vincetoxicum rossicum*). Forest and swamp communities are concentrated along the 14 creeks and tributaries in the Assessment Area. Meadow, thicket and woodland cultural communities are abundant throughout the Natural Environment Assessment Area in both urban and rural environments. The vegetation communities identified in the Assessment Area are common in Ontario based on the rankings assigned by the NHIC (MNRF 2021b).

Table 4.1: ELC Vegetation Communities Identified within the Natural Environment Assessment Area

ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Natural Environment Assessment Area
Forest (FO) Communities	FOD	Deciduous Forest	The FOD forest communities are comprised of a canopy of deciduous tree cover >60%. Tree species composition is variable between the individual FOD communities and may include native and/or non-native tree species. The FOD ELC code is a high-level classification used to assign a generic vegetation community description for forest communities located further from the Project Footprint where property access was not granted.
Forest (FO) Communities	FOD7	Fresh – Moist Lowland Deciduous Forest Ecosite	The FOD7 forest communities are located in tableland areas and along watercourses in the Natural Environment Assessment Area. Trees present in these communities are comprised of species that are tolerant of wetter soil conditions including Manitoba Maple (*Acer negundo*), Trembling Aspen (*Populus tremuloides*), White Birch (*Betula papyrifera*), Black Walnut (*Juglans nigra*) and American Basswood (*Tilia americana*).
Forest (FO) Communities	FOD9-1	Fresh – Moist Oak – Sugar Maple Deciduous Forest Type	The FOD9-1 forest community is located on the south side of Highway 401 between Townline Road South and Prestonvale Road. There is only a small portion of this community located in the Natural Environment Assessment Area, and it will not be impacted since it is on the opposite side of Highway 401 from the Project Footprint.

ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Natural Environment Assessment Area
Cultural (CU) Communities	CUM1	Mineral Cultural Meadow	The CUM1 meadow communities occur throughout the Natural Environment Assessment Area. Communities varied in size from larger areas of meadow to linear areas of meadow adjacent to the railroad tracks. The CUM1 ELC code is a high-level classification that was used to assign a generic vegetation community description for meadow communities where a definitive composition (graminoid, forb or mixed meadow) was not determined. Common species in the meadow communities in the Natural Environment Assessment Area included Kentucky Bluegrass (*Poa pratensis*), Smooth Brome (*Bromus inermis*), asters and goldenrods, Smooth Bedstraw (*Galium mollugo*) and Wild Carrot (*Daucus carota*).
Cultural (CU) Communities	CUM1/CUT1	Mineral Cultural Meadow/Mineral Cultural Thicket	The CUM1/CUT1 ELC description was used to describe communities that were a complex of meadow and thicket (see descriptions for CU1 and CUT1). These communities included a linear area along the Highway 401 corridor and two (2) smaller communities further from the Project Footprint.
Cultural (CU) Communities	CUM1-1	Dry-Fresh Old Field Meadow	The CUM1-1 meadow communities are comprised of former agricultural lands that have recently been left to naturally regenerate. Species composition in these types of fields are generally comprised of non-native species that easily invade fallow fields including Lamb's Quarters (*Chenopodium album*), Canada Horseweed (*Erigeron canadensis*) and Canada Thistle (*Cirsium arvense*), although native species such as goldenrods and asters can also be present.
Cultural (CU) Communities	CUM1-a	Dry - Fresh Graminoid Meadow Ecosite	There are three CUM1-a meadow communities identified in the Natural Environment Assessment Area. One very small community and two larger communities. These communities were dominated by grasses including Kentucky Bluegrass and Smooth Brome, with a lower occurrence of forb species including goldenrods, asters and Wild Carrot.
Cultural (CU) Communities	CUM1-b	Fresh - Moist Graminoid Meadow Ecosite	There was one CUM1-b meadow community identified in the Natural Environment Assessment Area along the Tributary to Darlington Creek 14 (east of Maple Grove Road). This community was comprised of grass species more tolerant of a wetter soil moisture regime including Reed Canarygrass (*Phalaris arundinacea);* however, there were sufficient upland terrestrial species identified (goldenrod and asters), that the community did not qualify as wetland.

ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Natural Environment Assessment Area
Cultural (CU) Communities	CUM1-c	Dry - Fresh Mixed Meadow	There are several CUM1-c meadow communities identified in the Natural Environment Assessment Area. These communities are equally dominated by grasses and forb species. Common grass species included Kentucky Bluegrass and Smooth Brome, and common forb species included goldenrods, asters and Wild Carrot.
Cultural (CU) Communities	CUP3	Coniferous Plantation	The CUP3 plantation communities are comprised of planted coniferous tree species, larger in size than a planted hedgerow. Plantations in the Natural Environment Assessment Area were comprised of Austrian Pine (*Pinus nigra*), Norway Spruce (*Picea abies*) and Scot's Pine (*Pinus sylvestris*).
Cultural (CU) Communities	CUS1	Mineral Cultural Savanna	There are four CUS1 savanna communities in the Natural Environment Assessment Area. These communities are comprised of cultural meadow species on the ground layer with a tree cover between 25% to ≤35%. Tree species in the savanna communities in the Natural Environment Assessment Area are comprised mostly of successional species including Manitoba Maple, Green Ash (*Fraxinus pennsylvanica*), Trembling Aspen and Black Walnut.
Cultural (CU) Communities	CUT1	Mineral Cultural Thicket	The CUT1 thicket communities occur throughout the Natural Environment Assessment Area. Communities varied in size from larger areas of thicket to linear areas of thicket adjacent to the railroad tracks. The CUT1 ELC code is a high-level classification that was used to assign a generic vegetation community description for thicket communities where a definitive composition (deciduous, coniferous or mixed thicket) was not determined. Common shrub species in the thicket communities in the Natural Environment Assessment Area included Common Buckthorn (*Rhamnus cathartica*) and Staghorn Sumac (*Rhus typhina*).
Cultural (CU) Communities	CUT1-a	Dry - Fresh Deciduous Shrub Thicket Ecosite	There are two CUT1-a thicket communities in the Natural Environment Assessment Area. These deciduous communities are comprised of Common Buckthorn, Staghorn Sumac and successional tree species including Green Ash and Manitoba Maple.
Cultural (CU) Communities	CUT1--b	Dry - Fresh Deciduous Regeneration Thicket	There are two CUT1-b thicket communities at the west end of the Natural Environment Assessment Area. These deciduous communities are comprised of young successional tree species including Green Ash, Manitoba Maple and Trembling Aspen. Common Buckthorn is also abundant.

ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Natural Environment Assessment Area
Cultural (CU) Communities	CUT1-c	Fresh – Moist White Cedar Coniferous Thicket Type	There is one CUT1- c thicket community at the west end of the Natural Environment Assessment Area, directly adjacent to the CP Rail tracks. This community was comprised of young Eastern White Cedar (*Thuja occidentalis*) trees.
Cultural (CU) Communities	CUW1	Mineral Cultural Woodland	The CUW1 woodland communities are comprised of a canopy of tree cover of 35% to ≤60%. These communities occur throughout the Natural Environment Assessment Area and varied in size from larger areas of woodland to linear areas of woodland adjacent to the railroad tracks. The CUW1 ELC code is a high-level classification that was used to assign a generic vegetation community description for woodland communities where a definitive species composition was not determined. Common tree species in the woodland communities in the Natural Environment Assessment Area included Manitoba Maple, Trembling Aspen and Black Walnut.
Cultural (CU) Communities	CUW1-a	Dry – Fresh Deciduous Woodland Ecosite	There are two linear CUW1-a woodland communities in the Natural Environment Assessment Area. The smaller community adjacent to the north yard is dominated by Trembling Aspen. The larger community along Highway 401 is comprised of hawthorn (*Crataegus* species), Trembling Aspen and Austrian Pine.
Cultural (CU) Communities	CUW1-b	Fresh - Moist Deciduous Woodland Ecosite	The CUW1-b woodland community was a unique combination of mature silver maple and successional species in Durham Court Park. Successional species were comprised of Trembling Aspen, Manitoba Maple. Willow (*Salix* species) shrubs, Red-osier Dogwood (*Cornus sericea*) and Common Buckthorn were present in the understory, and Dog-strangling Vine and goldenrod dominated the ground layer.
Cultural (CU) Communities	CUW1-c	Fresh - Moist Manitoba Maple Deciduous Woodland Type	There are two CUW1-c woodland communities in the Natural Environment Assessment Area. These deciduous communities are dominated by Manitoba Maple.
Cultural (CU) Communities	CUW1-d	Dry-Fresh Mixed Cultural Woodland	The CUW1-d woodland community was a unique combination of Scot's Pine and Green Ash west of Highway 418.
Swamp (SW) Communities	SWD	Deciduous Swamp	The SWD swamp communities are wetlands comprised of a canopy of tree cover >25%. The SWD swamp communities are located along watercourses in the Natural Environment Assessment Area. The SWD ELC code is a high-level classification that was used to assign a generic vegetation community description for SWD communities where a definitive species composition was

ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Natural Environment Assessment Area
			not determined. Common tree species in the swamp communities in the Natural Environment Assessment Area include Crack Willow *(Salix euxina)*, Manitoba Maple, Trembling Aspen, Green Ash and Black Walnut.
Swamp (SW) Communities	SWD2-2	Green Ash Mineral Deciduous Swamp Type	There is one SWD2-2 swamp community identified in the Natural Environment Assessment Area east of the Tributary to Darlington Creek 14 (east of Maple Grove Road). Green ash is the dominant tree species in this community. Trembling Aspen and American Elm (*Ulmus americana*) were also present in lower abundance.
Swamp (SW) Communities	SWD4	Mineral Deciduous Swamp Ecosite	The SWD4 swamp community is located along Farewell Creek north and south of the CP Rail tracks. The canopy is dominated by White Willow (*Salix alba*) and Manitoba Maple. Green ash, Eastern White Cedar and Common Buckthorn are also present in lower abundance. Ostrich Fern (*Onoclea struthiopteris*) is abundant in the ground layer.
Swamp (SW) Communities	SWD4-1	Willow Mineral Deciduous Swamp Type	The SWD4-1 swamp communities are located south of the CP Rail tracks at the Tributary to Darlington Creek 11 and north and south of the CP Rail tracks at the Tributary to Darlington Creek 12. The canopy is dominated by Crack Willow (*Salix euxina*) and the subcanopy is comprised of Manitoba Maple.
Swamp (SW) Communities	SWT	Thicket Swamp	The SWT thicket swamp communities are wetlands comprised of shrub cover >25%. There is one small SWT swamp community in the Natural Environment Assessment Area located between Rundle Road and Holt Road. The SWT ELC code is a high-level classification that was used to assign a generic vegetation community description for SWT communities where a definitive species composition was not determined. Common shrub species in the SWT communities in the Natural Environment Assessment Area include Gray Dogwood (*Cornus racemosa*), Red-osier Dogwood, young Green Ash and willow shrubs.
Swamp (SW) Communities	SWT2	Willow Mineral Deciduous Thicket Swamp Ecosite	The SWT2 thicket swamp communities are located west of Harmony Creek and north of the CP Rail tracks and east of Robinson Creek and north the CP Rail tracks. The community adjacent to Harmony Creek is dominated by Sandbar Willow (*Salix interior*), the willow thicket swamp community east of Robinson Creek was not identified to species.
Swamp (SW) Communities	SWT2-5	Red-osier Dogwood Mineral Deciduous	The SWT2-5 thicket swamp community is located west of Rundle Road and south of the CP Rail tracks. The community is dominated by Red-osier Dogwood.

ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Natural Environment Assessment Area
		Thicket Swamp Type	Manitoba Maple and Green Ash are also present in lower abundance.
Marsh (MA) Communities	MAM	Meadow Marsh	There are five MAM meadow marsh communities located in the Natural Environment Assessment Area. Three small MAM communities are located along the Tributary to Darlington Creek 11, one MAM community is located along a swale that extends from the SWM Pond at the Courtice Go Station and a larger MAM community is located along the restored delineated of Goodman Creek. The MAM ELC code is a high-level classification that was used to assign a generic vegetation community description for meadow marsh communities where a definitive composition (graminoid, forb or mixed meadow marsh) was not determined. Common species in the meadow marsh communities in the Natural Environment Assessment Area include Reed Canarygrass and Common Reed.
Marsh (MA) Communities	MAM2-2	Reed-canary Grass Graminoid Mineral Meadow Marsh Type	There are four MAM2-2 meadow marsh communities in the Natural Environment Assessment Area. There is one MAM2-2 community located south of the CP Rail tracks at Tooley Creek, one MAM2-2 community east of Robinson Creek and north of the CP Rail tracks, one MAM2-2 community east of McKnight Road and north of the CP Rail tracks and north of the CP Rail tracks between Rundle Road and Holt Road. Reed Canarygrass dominates these communities.
Marsh (MA) Communities	MAM2-a	Common Reed Mineral Meadow Marsh Type	There is one MAM2-a meadow marsh community in the Natural Environment Assessment Area. It is located on the north side of Baseline Road east of McKnight Road. The community is dominated by Common Reed. Reed Canarygrass is also present in this community in lower abundance.
Marsh (MA) Communities	MAS2-1	Cattail Mineral Shallow Marsh Type	There is one MAS2-1 shallow marsh community in the Natural Environment Assessment Area. It is located north of the CP Rail tracks on the west side of Trulls Road. The MAS2-1 community was dominated by Narrow-leaved Cattail (*Typha angustifolia*).
Shallow Water (SA) Communities	SA	Shallow Water	There is one SA shallow water community in the Natural Environment Assessment Area. It is located in the golf course west of Farewell Creek and south of the railroad tracks. Although SWM ponds also contain shallow water, they have been classified with the unofficial ELC code “SWM” since these features are considered infrastructure and do not qualify as SWH features.
Unofficial ELC	AG	Agriculture	The AG community code describes agricultural fields comprised of corn, soybeans and alfalfa.

ELC Community	ELC Code	ELC Description	Details of ELC Occurrence in the Natural Environment Assessment Area
Community Codes			
Unofficial ELC Community Codes	AG-Hay	Agriculture - Hay	The AG-Hay community code describes agricultural fields comprised of hay.
Unofficial ELC Community Codes	DEV	Development	The DEV community code includes developed lands (e.g., residential, commercial and industrial land uses).
Unofficial ELC Community Codes	HE1	Treed Deciduous Hedgerow	The HE1 community code is assigned to deciduous treed hedgerows. These communities are comprised mainly of naturalized treed areas that are too narrow to qualify as a forest or woodland ELC community. Naturalized HE1 communities are comprised of similar species identified in the FOD and CUW1 communities.
Unofficial ELC Community Codes	HE2	Treed Coniferous Hedgerow	The HE2 community code is assigned coniferous treed hedgerows. Unlike the HE1 communities, the coniferous hedgerows in the Natural Environment Assessment Area are planted. Species in these hedgerows are comprised of Norway Spruce and Austrian Pine.
Unofficial ELC Community Codes	HE3	Fencerow	The HE3 community code is assigned to fencerows. Fencerow communities are sparsely vegetated linear features comprised of trees or shrubs, usually along fencelines that delineate property boundaries. Common species in these communities include successional species including Common Buckthorn, Gray Dogwood, Green Ash and Manitoba Maple.
Unofficial ELC Community Codes	LAWN	Lawn	The LAWN community code is assigned to manicured lawn with planted trees associated with developed lands.
Unofficial ELC Community Codes	SWM	SWM Pond	The SWM community code is assigned to SWM pond infrastructure in the Natural Environment Assessment Area. There are seven SWM ponds throughout the Natural Environment Assessment Area.

One hundred thirty-eight (138) distinctive vascular plants were recorded in the Natural Environment Assessment Area, of which 62 species (45%) were native. All but two of the native plants documented had a provincial rank of S4[27] or S5[28], indicating they are

[27] S4: Apparently Secure - Uncommon but not rare.
[28] S5: Secure – Common, widespread, and abundant in the province.

common in Ontario. No highly sensitive plant species (CC = 9-10) were documented during the botanical inventory.

Butternut (*Juglans cinerea*), a provincially and federally endangered species (provincially ranked S2?[29]), was identified in the Natural Environment Assessment Area. A total of seven potential Butternut trees were visually identified in the Assessment Area during the field investigations, including one tree visually identified as a pure butternut within the Project Footprint. These trees were assessed for hybridity and Butternut Canker. Of the seven trees, BHA-002 located within the Project Footprint was visually determined to be a pure Butternut species with a Category of 3 (retainable). Genetic testing is underway to confirm purity. This individual tree is located adjacent to the Harmony Creek Golf Centre in Oshawa, Ontario. Authorization through a Registration of Notice of Activity under the ESA, 2007 will need to be pursued if this individual will be killed, harmed, or taken. Harm is typically delineated within a 50 m radius from the base of the tree. Two other potential Butternut trees within the Project Footprint were determined by genetic testing to be a hybrid species of butternut (*Juglans cinerea*) and Japanese Walnut (*Juglans ailantifolia*) (i.e., B-001) and a Japanese Walnut (*Juglans ailantifolia)* (i.e., B-003). Three other potential butternut trees (i.e., BHA-005, BHA-006, and BHA-007) outside of the Project Footprint but within the Natural Environment Assessment Area were visually determined to be hybrids. As hybrids, the remaining six trees (BHA-001, BHA-003, BHA-004, BHA-005, BHA-006, and BHA-007) do not receive protection under the ESA, 2007. Butternut is discussed further in Section 4.1.2.3.

Common Reed and Dog-strangling Vine, two highly invasive plant species, were abundant in the Natural Environment Assessment Area.

4.1.2.1 Wildlife

The following is a summary of observations and wildlife occurrence data for the Natural Environment Assessment Area. The results of the surveys and records reviews, including associated federal, provincial and local species rankings and statuses and reference details are provided in Appendix A1.

Avifauna

A total of 147 avifauna (i.e., birds) species were recorded within or near the Natural Environment Assessment Area based on the results of the wildlife records review and the fieldwork carried out in support of the Natural Environment Technical Report (NETR). Of these species, 141 (96%) were native and 6 (4%) were non-native species. Twelve (12) SAR and seven SOCC species were recorded for the area. These species

[29] The ? applies to the character immediately preceding it in the S-rank and denotes an inexact or uncertain numeric rank.

were included in the SAR and SOCC Habitat Screening Assessments, see Section 4.1.2.3 for details.

Additional breeding bird inventory surveys will be commencing at the detailed design phase to support any proposed removals of the meadows associated with the Courtice Road (B3 Courtice) GO Station development.

Breeding Bird Survey Results

Fifty-one (51) avian species were recorded during the 2021 and 2022 breeding bird surveys. All species listed in Appendix C of the NETR (Appendix A1), with the exception of Ring-billed Gull (*Larus delawarensis*), Great Blue Heron (*Ardea Herodias*), Osprey (*Pandion haliaetus*) and Red-tailed Hawk (*Buteo jamaicensis*), are presumed to be breeding in the Natural Environment Assessment Area. These four species were excluded due to the absence of suitable breeding habitat (i.e., stick nests, colonial breeding sites).

Eastern Meadowlark (*Sturnella magna*), a provincially and federally threatened species, was observed singing during the May 27, 2021 breeding bird survey in a fallow field south of Bloor Street East and west of the CP Rail tracks. This species was not observed in this location during the second or third round of surveys. Refer also to Section 4.1.2.3 for additional details.

Bobolink (*Dolichonyx oryzivorus*), a provincially and federally threatened species, was observed singing at two monitoring stations during the third round of 2021 breeding bird surveys, and at one monitoring station during the 2022 breeding bird survey. Bobolink was not observed at either station during the first or second round of breeding bird surveys. Refer also to Section 4.1.2.3 for additional details.

Barn Swallow (*Hirundo rustica*), listed provincially as special concern and federally as threatened, was observed foraging during all three rounds of breeding bird surveys at multiple monitoring stations, and during the 2022 breeding bird survey at one monitoring station. Further, there were suitable barns and buildings adjacent to the Project Footprint that likely provide Barn Swallow nesting habitat. Refer also to Section 4.1.2.3 for additional details. All bridges, overpasses and culverts were inspected for nesting structures throughout the field program. Three active Barn Swallow nests were observed nesting in one of the culverts associated with Darlington Creek in the Project Footprint, just east of Rundle Road. Barn Swallow was reclassified on January 25, 2023 on the SARO List (Ontario Regulation 230/08) as a special concern species. The change in classification means that the prohibitions in subsections 9 (1) and 10 (1) of the ESA, 2007 that apply in respect of endangered and threatened species and their habitats no longer apply to Barn Swallow. Barn Swallow observations continue to be relevant as they are related to SOCC under the criteria for SWH.

Eastern Wood-Pewee (*Contopus virens*) was observed calling in a tree at the edge of the CUM1-a meadow situated on the west side of the Natural Environment Assessment Area during the third round of breeding bird surveys. This is outside of suitable woodland/forest habitat preferred by Eastern Wood-Pewee and the CUM1-a meadow is not considered suitable habitat for this species.

Wild Turkey (*Cathartes aura*), Tree Swallow (*Tachycineta bicolor*) and Belted Kingfisher (*Megaceryle alcyon*) were observed in the Natural Environment Assessment Area as incidental observations outside of the breeding bird survey; however, these species were observed during surveys conducted during the breeding bird window and are presumed to be breeding in the Natural Environment Assessment Area.

Herpetofauna

A total of 19 herpetofauna species (i.e., amphibians and reptiles) were recorded within or near the Natural Environment Assessment Area based on the results of the wildlife records review and the 2021 field program. Of these species, 18 (95%) were native and 1 (5%) was a non-native species. One (1) SAR (i.e., Blanding's Turtle) and four (4) SOCC species (i.e., Eastern Milksnake, Map Turtle, Midland Painted Turtle and Snapping Turtle) were recorded for the area. These species were included in the SAR and SOCC Habitat Screening Assessments, see Section 4.1.2.3 for details.

Amphibian Call Survey Results

Four species of amphibians were observed (visual or auditory) during the amphibian surveys: American Toad (AMTO; *Anaxyrus americanus*), Green Frog (GRFR; *Lithobates clamitans*), Gray Treefrog (GRTR; *Dryophytes versicolor*) and Spring Peeper (SPPE; *Pseudacris crucifer*).

Call codes ranged from 1 to 2 for all stations. Three visual observations of GRFR were recorded at one station (Amphibian Call Station (AMP) AMP07; located east of Stevenson Road south and north of the rail corridor) on the pedestrian path adjacent to the channelized watercourse and associated meadow marsh wetland.

Mammals

A total of 36 mammalian species were recorded within or near the Natural Environment Assessment Area based on the results of the wildlife records review and the 2021 field program. Of these species, 33 (92%) were native and 3 (8%) were non-native species. One SAR species, Little Brown Myotis, was confirmed through recordings, and one is assumed to be present based on a lack of confirmatory markers in the calls. These species were included in the SAR Habitat Screening Assessments, see Section 4.1.2.3 for details. No SOCC species were observed or recorded within or near the Natural Environment Assessment Area.

Bat Acoustic Monitoring Survey Results

In 2021, five confirmed bat species were recorded during the acoustic monitoring surveys including one provincially and federally endangered species; Little Brown Myotis (*Myotis lucifugus*). The remaining four species recorded and confirmed to species level were Big Brown Bat (*Eptesicus fuscus*), Hoary Bat (*Lasiurus cinereus*), Silver-haired Bat (*Lasionycteris noctivagans*) and Eastern Red Bat (*Lasiurus borealis*).

Eastern Red Bat and Tricolored Bat (*Perimyotis subflavus*) have similar calls and can be difficult to distinguish, as such, some calls were placed into a category called "Tricolored Bat/Eastern Red Bat". Tri-Colored Bat is a provincially and federally endangered species. Where a positive identification could not be made, it was assumed the species was a SAR bat.

The total number of calls over the 10-day data subsets ranged from 94 (BMS5) to 2913 (BMS2). Four species (Big Brown, Hoary, Silver-haired and Eastern Red Bats) were observed at every detector location. Big Brown Bat and Hoary Bat were the most commonly recorded species, respectively.

Only one SAR bat was confirmed – Little Brown Myotis. This species was identified at 12 of the 25 ARUs (BMS2, BMS6, BMS11, BMS12, BMS14, BMS16, BMS17, BMS18, BMS19, BMS22, BMS23, and BMS24) with a total of 43 calls. The number of calls per autonomous recording unit (ARU) ranged from 1 to 33. In addition, one call at BMS19 was identified as *Myotis sp.* This call was very short, and as such the species could not be confirmed. A total of 37 calls from eight different ARUs were identified as Eastern Red Bat/Tri-Colored Bat. Due to the similarity of the calls of these two species, they could not be differentiated in these instances. Therefore, there is potential for a second SAR, Tri-Colored Bat occur on the site, but it could not be confirmed.

The number of Little Brown Myotis detected suggest that the Natural Environment Assessment Area may provide both foraging and roosting habitat for SAR bats.

In 2023, five confirmed bat species were recorded during the acoustic monitoring surveys, including Big Brown Bat, Eastern Red Bat, Hoary Bat, and Silver-haired Bat. As discussed above, Eastern Red Bat and Tri-colored Bat have similar calls and can be difficult to distinguish. Therefore, as such, some calls were placed into a category called "Tri-colored Bat/Eastern Red Bat". Likewise, where a positive identification could not be made, it was assumed the species was a SAR bat.

The total number of calls over the 15-day data subsets ranged from 70 (BMS27) to 567 (BMS28). Four species (Big Brown, Hoary, Silver-haired and Eastern Red Bats) were observed at each detector location. Big Brown Bat and Silver-haired Bat were the most commonly recorded species, respectively.

A total of two calls from BMS26 were identified as Eastern Red Bat/Tri-colored Bat. Due to the similarity of the calls of these two species, they could not be differentiated in these instances. Therefore, there is potential for a Tri-colored Bat, a SAR bat, to occur on the site, but it could not be confirmed.

Bat Exit Survey Results

In 2023, one confirmed bat species was recorded during the bat exit surveys. The recording was identified as a Big Brown Bat. This species was present at 399 Simcoe Street South (BES2) and 359 Ritson Road South (BES4). No other species were recorded. Target exit surveys completed in 2021 and 2023 did not detect SAR bats and therefore, suggests that anthropogenic roosting habitat for SAR bats is absent from the Natural Environment Assessment Area.

Insects

A total of 80 insect species were recorded within or near the Natural Environment Assessment Area based on the results of the wildlife records review and the 2021 field program. Of these species, 78 (98%) were native and 2 (2%) were non-native species. Three SAR species and three SOCC species were recorded for the area. These species were included in the SAR and SOCC Habitat Screening Assessments, see Section 4.1.2.3 for details.

Incidental Wildlife Observations

Wildlife recorded as incidental observations during field site visits included Belted Kingfisher, Tree Swallow, Wild Turkey, Chimney Swift (*Chaetura pelagica*), Eastern Chipmunk (*Tamias striatus*), Eastern Cottontail (*Sylvilagus floridanus*), Eastern Grey Squirrel (*Sciurus carolinensis*), Coyote (*Canis latrans*), White-tailed Deer (*Odocoileus virginianus*) and Snapping Turtle (*Chelydra serpentina*).

Two of the incidental species observed are designated as provincial and federal SAR and ranked as Threatened (Chimney Swift) and Special Concern (Snapping Turtle). The Chimney Swift was observed during the Bat Exit Surveys in 2023. Individuals were visually observed as flyovers and foraging throughout the Natural Environment Assessment Area. No chimneys were confirmed as roosting/breeding habitat within the Natural Environment Assessment Area. The Snapping Turtle was observed during the 2023 aquatic surveys at Farewell Creek, approximately 50 m north of the CP Rail corridor.

The remainder of incidental species observed are ranked common and secure in Ontario, with no provincial status or conservation rank.

4.1.2.2 Significant Wildlife Habitat

There are both confirmed and candidate SWH within the Natural Environment Assessment Area as summarized in Table 4.2 below.

Table 4.2: Confirmed and Candidate SWH in the Natural Environment Assessment Area

SWH	Description
Confirmed SWH	
Habitat for Bat Maternity Colonies	Forest and swamp communities along the existing rail corridor have been confirmed to support maternity roosting habitat for bats. Bats were recorded at all 25 BMSs that targeted forest and swamp communities across the Natural Environment Assessment Area.
Special Concern and Rare Wildlife Species: Barn Swallow (*Hirundo rustica*)	Barn Swallow is listed provincially as Special Concern and federally as Threatened and receives protection under the MBCA. Three active Barn Swallow nests were observed in one of the culverts associated with Darlington Creek in the Project Footprint, just east of Rundle Road. Barn Swallow was observed foraging and nesting within the Natural Environment Assessment Area.
Special Concern and Rare Wildlife Species: Monarch (*Danaus plexippus*)	Monarch, a provincially and federally designated Special Concern species, was observed in the Natural Environment Assessment Area during field investigations. An abundance of Monarch's larval host, common milkweed, was observed in the large CUM1 meadow at the east side of the Assessment Area south of the railroad tracks and east of Bowmanville Avenue. There were five Monarch observations in this meadow during field investigations conducted on June 15, 2021; however, there was no breeding evidence observed (i.e., caterpillars or chrysalises).
Special Concern and Rare Wildlife Species: Eastern Wood-Pewee (*Contopus virens)*	Eastern Wood-Pewee, a provincially and federally designated Special Concern species, was observed in the Natural Environment Area during field investigations. This species receives protection under the MBCA. Eastern Wood-Pewee was observed calling in a tree at the edge of the CUM1-a meadow on the west side of the Assessment Area during the third round of breeding bird surveys. This is outside of suitable woodland/forest habitat preferred by Eastern Wood-Pewee and therefore, the CUM1-a meadow is not considered suitable habitat for this species. Eastern Wood-Pewee is more likely to be nesting in the adjacent FOD7 woodland or treed inclusions in the adjacent CUT1-b thicket community.
Special Concern and Rare Wildlife Species: Snapping Turtle *(Chelydra serpentina)*	Snapping Turtle, a provincially and federally designated Special Concern species, was observed in the Natural Environment Area during 2023 field investigations. This species receives protection under the *Fish and Wildlife Conservation Act*, 1997. Snapping Turtle was observed in Farewell Creek and this is therefore considered confirmed habitat. This species also has the potential to occur in Oshawa Creek, Harmony Creek, the seven stormwater management ponds and two small shallow aquatic features in the Natural Environment Assessment Area. This may include overwintering in these

SWH	Description
	features. There is also potential for Snapping Turtle to use the watercourses as a movement corridor.
Candidate SWH	
Turtle Wintering Areas	Oshawa Creek and Harmony Creek provide permanent standing water in the Natural Environment Area that has the potential to support turtle wintering areas. SWM ponds in the Natural Environment Area may support turtle wintering areas; however, they do not qualify as SWH.
Shrub/Early Successional Bird Breeding Habitat	There is one thicket in the Natural Environment Assessment Area > 10 ha in size east of Bloor Street East and south of the railroad tracks. The thicket was dominated by invasive shrub species including Common Buckthorn, Autumn Olive (*Elaeagnus umbellata*) and Tartarian Honeysuckle (*Lonicera tatarica*). There were no shrub/early successional indicator species (as per the Criteria Schedule) identified during field investigations. Out of the common listed bird species in the Criteria Schedule, only Willow Flycatcher (*Empidonax traillii*) was observed during field investigations. Although the thicket qualifies as SWH due to its size, the non-native composition of the feature reduces the qualify of the habitat and may impact the suitability of the habitat for certain bird species.
Terrestrial Crayfish	Terrestrial crayfish burrows were not observed during field investigations from the ROW; however, there is a potential for terrestrial crayfish to occur in the Natural Environment Assessment Area adjacent to marsh and swamp communities outside of the ROW.
Special Concern and Rare Wildlife Species: Yellow-banded Bumble Bee (*Bombus terricola*)	Candidate habitat for Yellow-banded Bumble Bee, a provincially and federally designated Special Concern species, was present throughout the urban and rural landscape of the Natural Environment Assessment Area.
Special Concern and Rare Wildlife Species: Eastern Milksnake (*Lampropeltis triangulum*)	Candidate habitat for Eastern Milksnake, a federally designated Special Concern species, was present throughout the rural landscape of the Natural Environment Assessment Area. This includes meadows, agricultural lands, thickets, savannas and woodlands, especially in proximity to older buildings and water.
Special Concern and Rare Wildlife Species: Northern Map Turtle (*Graptemys geographica*)	Candidate habitat for Northern Map Turtle, a provincially and federally designated Special Concern species, has the potential to occur in Oshawa Creek, Harmony Creek. This may include overwintering in these features. There is also potential for Northern Map Turtle to use the watercourses as a movement corridor.
Special Concern and Rare Wildlife Species: Midland Painted Turtle (*Chrysemys picta marginate*)	Candidate habitat for Midland Painted Turtle, a federally designated Special Concern species, has the potential to occur in Oshawa Creek, Harmony Creek, the seven SWM ponds and two small shallow aquatic features in the Natural Environment Assessment Area. This may include overwintering in these features. There is also potential for Midland Painted Turtle to use the watercourses as a movement corridor.

SWH	Description
Special Concern and Rare Wildlife Species: Snapping Turtle (*Chelydra serpentina*)	Candidate habitat for Snapping Turtle, a provincially and federally designated Special Concern species, has the potential to occur in Oshawa Creek, Harmony Creek, the seven SWM ponds and two small shallow aquatic features in the Natural Environment Assessment Area. This may include overwintering in these features. There is also potential for Snapping Turtle to use the watercourses as a movement corridor.

4.1.2.3 Species at Risk

Habitat screenings for SAR and SOCC were completed for the Natural Environment Assessment Area. The full results of the assessment are provided in Appendix A1. SAR and SOCC confirmed within the Natural Environmental Assessment Area are listed in Table 4.3 and SAR with a potential to be located within the Natural Environmental Assessment Area are listed in Table 4.4.

Table 4.3: SAR and SOCC Confirmed within the Natural Environment Assessment Area

SAR	Description
SAR bats, including Little Brown Myotis and Tri-Colored Bat	Little Brown Myotis and Tri-Colored Bats are listed provincially and federally as Endangered and receive protection under the ESA, 2007 and SARA.
Bobolink	Bobolink is listed provincially and federally as Threatened and receives protection under the ESA, 2007, as well as the MBCA. Bobolink was observed singing at two different monitoring stations a during the third round of 2021 breeding bird surveys and at one monitoring station during the 2022 breeding bird survey. Bobolink was not observed at either station during the first and second round of breeding bird surveys.
Eastern Meadowlark	Eastern Meadowlark is listed provincially and federally as Threatened and receives protection under the ESA, 2007, as well as the MBCA. Eastern Meadowlark was observed singing during the May 27, 2021 breeding bird survey in a fallow field south of Bloor Street East and west of the CP Rail tracks; however, it was not observed in this location during the second and third round of surveys.
Chimney Swift	Chimney Swift is listed provincially and federally as Threatened and receives protection under the ESA, 2007, as well as the MBCA. Chimney Swift was observed foraging and flying over the Project Footprint during the June 19, 2023, bat exit surveys at 399 Simcoe Street South. However, individuals were not observed entering/exiting chimneys and breeding/roosting habitat cannot be confirmed at this location.
Snapping Turtle	Snapping Turtle is listed provincially and federally as Special Concern and do not receive protection under the ESA, 2007. One Snapping Turtle was observed in Farewell Creek on July 11, 2023 during aquatic surveys along the rocky shoreline.

SAR	Description
Butternut	Butternut is listed provincially and federally as Endangered and receives protection under the ESA, 2007. Butternut was visually identified in the Natural Environment Assessment Area during field investigations south of the railroad tracks and west of Bloor Street East. One tree out of the seven butternut trees observed was visually identified as a pure butternut. Genetic testing is underway to confirm purity. Based on the visual assessment, this tree was categorized as a Category 3, retainable tree.

Table 4.4: SAR with a Medium to High Probability of occurring within the Natural Environment Assessment Area

SAR	Description
Blanding's Turtle	Blanding's Turtle is listed provincially and federally as Threatened and receives protection under the ESA, 2007. Oshawa Creek, Harmony Creek, the seven SWM ponds and two small shallow aquatic features in the Natural Environment Assessment Area have the potential to support Blanding's Turtle. This may include overwintering in these features.

4.1.2.4 Significant Natural Heritage Features

Natural heritage features are areas of high sensitivity or value or regulatory importance, and include features such as significant wetlands, significant woodlands, significant valleylands, SWH, ANSIs, fish habitat and habitat of endangered and threatened species. In accordance with Policy 1.6.8.6 of the PPS, consideration is to be given to natural heritage features and areas when planning for corridors and rights-of-way for significant transportation and infrastructure facilities.

The results of the background review have identified a number of natural features within the Project Footprint and /or greater Natural Environment Assessment Area. These features are summarized below:

- **Wetlands:** Several unevaluated wetlands have been mapped by the MNRF within the Natural Environment Assessment Area. The majority of these features are riverine type wetlands located adjacent to existing watercourses which transect the existing rail corridor and include the corridors associated with Harmony Creek, Robinson Creek, Tooley Creek, and Darlington Creek tributaries. All wetlands have a cultural significance to Indigenous communities.
- **Valleylands**: Valleylands have been identified / mapped by the province (Greenbelt Urban River Valley). Urban River Valley valleyland features have been mapped adjacent to Oshawa Creek, Harmony Creek, and Farewell Creek.

- **Watercourses:** Portions of a number of tributaries have been previously identified / mapped within the Natural Environment Assessment Area. Many of these features transect the existing rail corridor, including Oshawa Creek, Harmony Creek, Farewell Creek, Robinson Creek, Tooley Creek, and Darlington Creek. All watercourses have a cultural significance to Indigenous communities.

- **Fish Habitat:** Fish habitat has been identified through review of watershed studies within the Natural Environment Assessment Area associated with some of the creek systems (CLOCA 2021).

- **Woodlands**: Woodlands have been mapped within the Natural Environmental Assessment Area by the province (LIO 2021). No woodlands have been specifically identified by the upper or lower tier municipalities within the Natural Environment Assessment Area, however criteria for significant woodlands that are not located within the Oak Ridges Moraine are provided by the applicable Official Plans (OPs). Based on these criteria, significant woodlands would be considered present where mature forest ecosites intersect with other significant habitat features or meet the minimum size and stand age requirements, especially along creek corridors.

The results of the background review did not identify the presence of any of the following natural heritage features or areas within the Natural Environment Assessment Area, as summarized below:

- PSWs
  - Farewell Creek and Harmony Creek connect to the Oshawa Second Marsh PSW approximately 1km south of the Project Footprint.
  - An unnamed watercourse approximately 500m west of Prestonvale Road connects to the McLaughlin Bay Coastal PSW Complex approximately 300m south of the Project Footprint.
- Coastal wetlands
- ANSIs
- Previously identified SWH (refer to Section 4.1.2.2, for SWH identified through the Natural Environment Technical Report)
- Significant Woodlands

Other natural heritage designated areas, in accordance with upper and lower tier OPs, provincial planning policy, and other regulatory agencies include:

- **Greenbelt Urban River Valley:** Oshawa Creek, Harmony Creek, and Farewell Creek valleylands are designated by the province as Urban River Valley under Greenbelt Plan.
- **CLOCA Regulatory Areas:** Goodman Creek, Oshawa Creek, Harmony Creek, Farewell Creek, Robinson Creek, Tooley Creek, Darlington Creek tributaries and associated hazard lands within the Natural Environment Assessment Area are mapped and regulated by CLOCA under O. Reg. 42/06.
- **Greenlands System:** Lands surrounding Oshawa Creek, Harmony Creek, Farewell Creek, as well as a block of rural land located at the east end of the Natural Environment Assessment Area (generally between Rundle Road and Maple Grove Road) have been designated by Regional Municipality of Durham as Major Open Space Areas under their Greenlands System. Similarly, the City of Oshawa has identified Open Space and Recreation (under their Greenland Areas designation) for similar areas within their jurisdiction (surrounding Oshawa Creek, Harmony Creek, and Farewell Creek)
- **Key Natural Heritage Features and Key Hydrological Features (KNHF and KHF):** KNHFs and KHFs have been mapped / identified by the Regional Municipality of Durham and by the City of Oshawa for lands within the Natural Environment Assessment Area. These designated areas are associated with Oshawa Creek, Farewell Creek, Harmony Creek, Robinson Creek, Tooley Creek and Darlington Creek main corridors and in some cases, connected woodlands and associated tributaries.
- **Natural Heritage System (NHS):** Lands surrounding various creek systems within the Natural Environment Assessment Area have been identified by CLOCA and the lower tier municipalities as NHS. Specifically, Oshawa Creek, Goodman Creek, Harmony Creek and the Farewell Creek corridors have been designated as NHS by the City of Oshawa and Robinson Creek, Tooley Creek and tributaries of Darlington Creek have been designated as NHS by the Municipality of Clarington. All of these areas are also identified as part of CLOCA's NHS.
- **Environmental Protection Area:** Lands surrounding the various creek systems (Robinson Creek, Tooley Creek, Darlington Creek and associated tributaries) have been designated by the Municipality of Clarington as Environmental Protection Area.
- **Green Space:** Lands within the Natural Environment Assessment Area surrounding Prestonvale Road has been designated by the Municipality of Clarington as Green Space.

In accordance with the Greenbelt Plan, Durham Regional OP and lower tier municipal OPs, designated areas within the provincial NHS (Greenbelt Urban Valley) and additional NHS systems identified by the upper and lower tier municipalities are known to encompass land or water with the highest concentration of sensitive and/or significant natural features and functions, including natural heritage features and areas. These defined areas may encompass natural features and areas (e.g., woodlands, wetlands, or significant features including SWH, habitat of endangered and threatened species, etc.) not previously mapped or identified through detailed assessments.

4.2 Tree Inventory

Trees assessed within the Project Footprint include those that have been planted by humans as well as those that have been seeded through natural processes.

4.2.1 Site Investigation Observations

A total of 4,189 trees, including 19 vegetation units were inventoried during the fieldwork. The western portions of the Project Footprint had larger numbers of trees with agricultural land being more predominant in the eastern portion of the Project Footprint. Species in 16 tree families (Table 4.5 below) were observed plus one large shrub family. Species diversity is consistent with other surveys conducted in the area and includes several introduced species.

Table 4.5: Observed Species during the Tree Inventory

Family	Genus and Species
Anacardiaceae (cashew family)	Staghorn sumac *(Rhus typhina)*
Betulaceae (birch family)	Paper birch *(Betula papyrifera)*
Cupressaceae (cypress family)	Eastern red cedar *(Juniperus virginiana)* Eastern white cedar *(Thuja occidentalis)*
Elaeagnaceae (oleaster family)	Russian olive *(Elaeagnus angustifolia)*
Fabaceae (legume family)	Thornless honeylocust *(Gleditsia triacanthos var. inermis)* Kentucky coffeetree *(Gymnocladus dioicus)* Black locust *(Robinia pseudoacacia)*
Fagaceae (beech family)	Red oak *(Quercus rubra)*
Juglandaceae (walnut family)	Butternut *(Juglans cinerea)* Walnut (*Juglans nigra)*
Magnoliaceae (magnolia family)	Tulip tree (*Liriodendron tulipifera)*
Malvaceae (mallow family)	Basswood *(Tilia americana)* Linden *(Tilia cordata)*

Family	Genus and Species
Oleaceae (olive family)	Ash species *(Fraxinus sp.)*
Pinaceae (pine family)	*Balsam fir (Abies balsamea)* Tamarack *(Larix laricina)* Norway spruce *(Picea abies)* White spruce *(Picea glauca)* Red pine *(Pinus resinosa)* White pine *(Pinus strobus)* Scots pine *(Pinus sylvestris)*
Rhamnaceae (buckthorn family)	European buckthorn *(Rhamnus cathartica)*
Rosaceae (rose family)	Hawthorn species *(Crataegus sp.)* Apple species *(Malus sp.)* Cherry species *(Prunus sp.)* Common pear *(Pyrus communis)* Mountain ash *(Sorbus americana)* European mountain ash *(Sorbus aucuparia)*
Salicacaeae (willow family)	White poplar *(Populus alba)* Poplar species *(Populus sp.)* Trembling aspen *(Populus tremuloides)* White willow *(Salix alba)* Black willow *(Salix nigra)* Willow species *(Salix sp.)*
Sapindaceae (soapberry family)	Manitoba maple *(Acer negundo)* Norway maple *(Acer platanoides)* Red maple *(Acer rubrum)* Silver maple *(Acer saccharinum)* Sugar maple *(Acer saccharum)*
Ulmaceae (elm family)	White elm *(Ulmus americana)* Siberian elm *(Ulmus pumila)* Elm species *(Ulmus sp.)*

4.2.2 Endangered and Rare Species

One tree within the Project Footprint was observed to be listed on the Ontario SAR list. Tree B-002 has been visually identified as pure butternut (*Juglans cinerea*). Genetic testing is underway to confirm purity.

4.3 Geology and Groundwater

Geology refers to surface and below-ground conditions of the organic and inorganic compounds that make up the soil and rock that support plant and animal life and human activities and structures, including chemical or other compounds that may have entered the soil as a result of human activities.

Groundwater refers to below-ground water conditions, including the flow of water from the surface into the groundwater, and the presence or absence of drinking water wells.

4.3.1 Landforms and Physiography

The Study Area is situated within the “Iroquois Plain” physiographic region (Chapman and Putnam 1984:190-196).

> *The lowland bordering Lake Ontario, when the last Glacier was receding but still occupied the St. Lawrence Valley, was inundated with by a body of water known as Lake Iroquois which emptied eastward at Rome, New York State. Its old shorelines, including cliffs, bars, beaches, and boulder pavements are easily identifiable features…. The Iroquois plain extends around the western part of Lake Ontario, from the Niagara River to the Trent River…, its width varying from a few hundred meters to about eight miles.*
>
> (Chapman and Putnam 1984:190)

Numerous water sources can be found within close proximity to the Study Area, the largest being Lake Ontario, located directly south of the Project. Other water sources which intersect the Project Footprint include; Goodman Creek, Oshawa Creek, Farewell Creek, Harmony Creek, Unnamed Tributary, Robinson Creek, Tooley Creek, Darlington Creek, and Darlington Creek tributaries.

Two main soil types predominate the Study Area, Darlington loam and Whitby loam. Darlington loam is classified as being a dark grey-brown loam with smooth deposits, good drainage with undulating to rolling hills, ideal for general agricultural purposes (Webber and Morwick 1946). Whitby loam is described as varying from loam to silt loam in texture, with few stones and boulder inclusions. Gentle sloping topography is associated with Whitby loam but imperfect drainage limits the production of crops. The Whitby loam soils are more suited to use as pastureland, hay production and spring grain (Olding and Wicklund 1949).

4.3.2 Soils and Bedrock Geology

Based on information obtained from MNR Ontario Geological Survey Map 2556, titled *Quaternary Geology of Ontario, Southern Sheet*, native surficial soils in the Study Area are reported to consist of sandy silt to silt till and/or silt and clay with minor sand. The characteristic permeability of these soil deposits is moderate to low. A site-specific determination would be required in order to obtain detailed soil profile and permeability information.

Based on information obtained from MNR Ontario Geological Survey Map 2544, titled *Bedrock Geology of Ontario, Southern Sheet*, bedrock in the area of the Project is reported to consist of shale, limestone, dolostone, and/or siltstone. The depth to bedrock was not indicated on the map; however, the EcoLog Environmental Risk Information Services (ERIS) report indicated that bedrock was encountered at various locations within the Project Footprint at depths ranging from 2.1 m to 16.5 m below ground surface. Findings of four geotechnical studies undertaken for the Project determined bedrock was located at depths of 10.1 m to 14.6 m below ground surface (Golder Associates Ltd. 2022a to 2022d).

A Limited Phase I ESA (Stantec 2021) was conducted to determine if current and/or former potentially contaminating activities (PCAs) have contributed to potential environmental contamination within the Phase I ESA Assessment Area. Properties within the Phase I ESA Assessment Area were categorized as low risk, medium risk or high risk of impacting the soil and/or groundwater within the Assessment Area. The Limited Phase I ESA revealed evidence of medium and higher risk PCAs that may have contributed to soil and/or groundwater contamination at the Phase I ESA Assessment Area.

Medium risk PCAs do not pose an immediate concern to the Project Area. Higher risk PCAs have the potential to contribute to environmental contamination within the Project Footprint. In both cases, these PCAs should be taken into consideration when designing a site characterization investigation in support of detailed design, soil management, dewatering management, and construction activities.

As part of the geotechnical studies, soil samples were analyzed for environmental parameters at select locations throughout the Project Footprint (Golder Associates Ltd. 2022a to 2022d; WSP Canada Inc. 2023a, 2023e to 2023h). Analysis results were compared to analytical parameters specified under O. Reg. 153/04, depending on Site Condition Standards (SCS), which are presented in Table 1 to Table 9 of the *Provincial Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*. The standards used for comparison were:

- MECP Table 1 SCS: Full Depth Background Site Condition Standards for Residential, Parkland, Institutional, Industrial, Commercial, Community Property Use

- MECP Table 2 SCS: Full Depth Generic Site Condition Standards in a Potable Groundwater Condition for Industrial, Commercial, Community Property Use, for coarse-textured soil

The soils sampled had exceedances at some locations of various parameters for Table 1 SCS. In addition, exceedances of Table 2 SCS were also detected at several sampling locations. Refer to Table 4.6 for a summary of soil sample results.

Table 4.6: Analytical Results of Bulk Soil Samples

Golder Associates Ltd. Geotechnical Investigation and Design Report	Exceedances of MECP Table 1 SCS	Exceedances of MECP Table 2 SCS
Stevenson Road Bridge	• No exceedances	• No exceedances
Park Road Bridge	• Electrical Conductivity • Sodium Adsorption Ratio • Petroleum Hydorcarbons – F2 (C10-C16) • Acenaphthylene • Benzo[a]phyrene • Benzo [b,j], fluoranthene • Indeno [1,2, 3-cd]pyrene	• Electrical Conductivity Sodium Adsorption Ratio • Acenaphthylene • Benzo[a]phyrene
Oshawa Creek Bridge	• No exceedances	
Simcoe Street Bridge	• Electrical Conductivity	• No exceedances
Albert Street Bridge	• Electrical Conductivity Sodium Adsorption Ratio	• Sodium Adsorption Ratio
Front Street Multi-Use Crossing (Michael Starr Trail)-Michael Starr Pedestrian Overpass	• Sodium Adsorption Ratio	• No exceedances
Ritson Road Bridge	• Electrical Conductivity Sodium Adsorption Ratio • Benzene • Xylenes	• Sodium Adsorption Ratio
Wilson Road Bridge	• No exceedances	• No exceedances
Courtice Road Bridge	• Electrical Conductivity Petroleum Hydrocarbons – F2 (C10-C216)	• No exceedances

4.3.3 Groundwater Resources

Based on the Department of Energy, Mines and Resources topographic map 30 M/15 and the observed topography in the vicinity of the Project, the regional surface drainage (inferred regional groundwater flow direction) appears to be southerly towards Lake Ontario.

It should be noted, however, the elevation of the local shallow groundwater table can generally mimic the nearby topography and may not reflect the regional trend in drainage. The local shallow groundwater flow pattern can also be influenced by subsurface structures in the vicinity, such as building foundations, weeping tiles, and utility trenches.

Golder Associates Ltd. and WSP Canada Inc. (Golder Associates Ltd. 2022a to 2022d; WSP Canada Inc. 2023a to 2023h) compared groundwater samples from select boreholes at locations throughout the Project Footprint to the applicable limits of the following:

- O. Reg. 153/04, Table 2 SCS
- the Regional Municipality of Durham's Sewer Use By-law
  - Table 1 – Limits for Sanitary Sewer Discharge
  - Table 2 – Limits for Storm Sewer Discharge
- Provincial Water Quality Objectives (PWQO)

In the samples collected, exceedances were found for several parameters at various locations as summarized in Table 4.7.

Table 4.7: Analytical Results of Groundwater Samples

Golder Associates Ltd. Geotechnical Investigation and Design Report	Exceedances of O. Reg. 153/04, Table 2 SCS	Exceedances of Table 1 – Limits for Sanitary Sewer Discharge	Table 2 – Limits for Storm Sewer Discharge	Exceedances of PWQO
Stevenson Road Bridge	• No exceedances	• No exceedances	• Total Suspended Solids Manganese • Phosphorus • Zinc	• Cobalt • Copper • Zinc

Golder Associates Ltd. Geotechnical Investigation and Design Report	Exceedances of O. Reg. 153/04, Table 2 SCS	Exceedances of Table 1 – Limits for Sanitary Sewer Discharge	Table 2 – Limits for Storm Sewer Discharge	Exceedances of PWQO
Park Road Bridge	• No exceedances	• Aluminum • Manganese	• Arsenic • Chromium • Copper • Nickel • Zinc • Phosphorus	• Chromium • Copper • Nickel • Zinc • Cadmium • Cobalt
Oshawa Creek Bridge	• No exceedances	• No exceedances	• No exceedances	• Cobalt • Iron • Hydrogen sulfide
Simcoe Street Bridge	• No exceedances	• No exceedances	• Total Kjeldahl Nitrogen • Total Suspended Solids	• Phosphorus
Albert Street Bridge	• N/A	• No exceedances	• Manganese • Total Suspended Solids	• Aluminum • Cobalt • Phosphorus
Ritson Road Bridge	• No exceedances	• No exceedances	• Manganese	• Chromium • Cobalt • Copper • Phosphorus
Wilson Road Bridge	• No exceedances	• No exceedances	• Total Suspended Solids	• Total Aluminum
Harmony Creek Bridge	• N/A	• No exceedances	• Phosphorus • Zinc	• Phenols • Cobalt • Copper • Iron • Lead • Nickel • Thallium • Vanadium • Zinc • Zirconium • Toluene

Golder Associates Ltd. Geotechnical Investigation and Design Report	Exceedances of O. Reg. 153/04, Table 2 SCS	Exceedances of Table 1 – Limits for Sanitary Sewer Discharge	Table 2 – Limits for Storm Sewer Discharge	Exceedances of PWQO
Farewell Creek Bridge	• N/A	• No exceedances	• Benzene • Ethylbenzene	• Hydrogen Sulfide • Iron • Phenolics • Toluene
Courtice Road Bridge	• No exceedances	• No exceedances	• Zinc	• Cobalt • Copper • Vanadium • Zinc • Iron • Zirconium
Green Road Rail Bridge	• N/A	• No exceedances	• Arsenic • Chromium • Copper • Lead • Nickel • Zinc • Manganese • Phosphorus • Nitrogen, Kjeldahl • Total Suspended Solids	• Aluminum • Cadmium • Cobalt • Copper • Lead • Molybdenum • Nickel • Silver • Zinc • pH

N/A = Not available

A review of domestic well records within 50 m of the Project Footprint was conducted for the Municipality of Clarington. A total of 12 domestic wells were identified (MECP 2023). Well records within the Municipality of Oshawa were not researched as the Project Footprint traverses urban areas serviced by the municipal water.

4.4 Stormwater Management

SWM refers to the elements of the environment (natural or human-made) that affect the flow of precipitation through the environment once it hits the ground.

The Project Footprint includes portions of two major watersheds: Oshawa Creek and Farewell Creek. The Farewell Creek Watershed includes Black and Harmony Creeks and three smaller watersheds: Robinson Creek, Tooley Creek and Darlington Creek.

The Oshawa Creek Watershed extends from the Oak Ridges Moraine (ORM) at its northerly (most upstream) extent and drains in a southerly direction before ultimately discharging into Lake Ontario at the Oshawa Harbour. The Oshawa Creek Watershed measures approximately 120 square kilometres (km^2). The watershed is primarily located within the City of Oshawa but also includes lands partially located within the Municipality of Clarington (east), Town of Whitby (west) and Township of Scugog (north). Within the City of Oshawa, there is an existing flood hazard condition along Oshawa and Goodman Creeks upstream of the CP Rail crossing of Oshawa Creek (CLOCA 2021c). An estimated 712 buildings or structures are located within the policy area studied and are at risk of flooding; of those 712 buildings or structures, 326 of the buildings/structures are vulnerable to flooding due to the existing CP Rail bridge and embankment (CLOCA 2021c).

The Farewell Creek (including Black and Harmony Creeks) watershed drains southerly from its headwaters in the south slope till plain of the ORM and empties into Lake Ontario through a diversion channel adjacent to Oshawa Second Marsh, a Provincially Significant Wetland. Black/Harmony/Farewell Creeks and its tributaries drain a combined area of approximately 108 km^2 (CLOCA 2013). The urban areas of the City of Oshawa and Courtice in the Municipality of Clarington occupy most of the south, while the northern part of the watershed is dominated by agricultural land uses. A large portion of the mid-eastern section of the watershed is covered by the Harmony-Farewell Iroquois Beach Provincially Significant Wetland Complex, representing important groundwater and natural heritage resources (CLOCA 2013). The Robinson Creek watershed is situated almost completely within the Urban Area of Courtice. The Robinson Creek watershed drains an area of approximately 578 ha (AECOM 2011b). The Robinson Creek drains into Lake Ontario through the McLaughlin Bay Wetland Complex. Robinson Creek may receive groundwater discharge from the Iroquois Beach deposits and the lower sediments (CLOCA 2004). The urban area of the Towns of Courtice occupies a part of the watershed in the north while the southern part is dominated by agricultural land uses.

The Tooley Creek watershed drains an area of approximately 1,040 ha (AECOM 2011b). The Tooley Creek drains into Lake Ontario through the Tooley Creek Coastal Wetland. Tooley Creek may receive groundwater discharge from the Iroquois Beach deposits and the lower sediments (CLOCA 2004). The Tooley Creek Watershed is located in the Regional Municipality of Durham, entirely within the local Municipality of Clarington. The Tooley Creek watershed is dominated by agricultural land uses.

The Darlington Creek watershed drains an area of approximately 1782 ha (City of Pickering 2021). Darlington Creek drains into Lake Ontario at the Darlington Nuclear Generating Station. Darlington Creek may also receive groundwater discharge from the Iroquois Beach deposits and the lower sediments (CLOCA 2004). The Darlington Creek Watershed is located entirely within the local Municipality of Clarington. The urban

areas of the Town of Bowmanville occupy most of the south, while the northern part of the watershed is dominated by agricultural land uses.

The proposed GO tracks within the City of Oshawa are divided into 62 subcatchments, and the runoff from each subcatchment is collected via existing ditches and subdrains which convey the flow to 33 different outlets along this corridor segment. Eighteen of these outlets consist of drainage structures connected to existing storm sewer systems. Nine of these outlets include existing culverts, which convey flows across the track. The remaining six outlets discharge directly into the adjacent receiving surface water features.

The proposed GO tracks within the Municipality of Clarington segment is divided into 84 subcatchments, and the runoff from each subcatchment is collected via proposed and/or existing ditches and subdrains which convey the flow to 33 different receiving outlets. Three of these outlets consist of drainage structures connected to existing storm sewer systems. Twenty of the outlets are existing culverts, which convey the flow across the track. The remaining ten outlets discharge directly into adjacent receiving surface drainage features.

Through the NETR, seven SWM ponds were identified within the Natural Environment Assessment Area but outside of the Project Footprint. SWM ponds are situated at the following approximate locations:

- 680 Laval Drive, Oshawa
- Adjacent to the intersection of Southport Drive and Townline Road South, Oshawa
- 1350 Durham Regional Road 34, Courtice
- 1100 Hancock Road, Courtice
- 570 Rundle Road, Bowmanville
- 2021 Baseline Road, Courtice
- 1 McKnight Road, Courtice

4.5 Air Quality

AQ refers to the presence or absence of substances in the air that could cause harm to humans in large enough quantities. This includes substances in gaseous or solid (particulate) form.

Background ambient AQ concentrations at the Toronto West and Roadside 401W Toronto stations are expected to be representative of ambient concentrations in the Air Quality Assessment Area since the Project is located in close proximity to Highway 401.

The background ambient AQ concentrations are compared with applicable AQ Objectives in the AQ Technical Report (Appendix A3). Background levels for the Contamination of Interest (COIs) are below their applicable objectives with the exception of NO_2, benzene and Benzo (a) pyrene (B(a)P). The annual background concentration of NO_2 exceeds the 2025 Canadian Ambient Air Quality Standards (CAAQS) by 18% and the annual background concentration of benzene exceeds the Ambient Air Quality Criteria (AAQC) by 19%. Background concentrations of B(a)P for both 24-hour and annual averaging periods are almost twice and seven and a half times the applicable criteria, respectively. Exceedances of the AAQC for B(a)P are commonly measured in Ontario; major industrial sources are typically associated with the iron and steel industry, and petroleum products (MECP 2021c).

The provincial and national GHG emissions from reportable activities in Ontario and Canada for the most recently available year (MECP 2019b) were reviewed, along with national and Ontario transportation sector emissions. Canadian GHG emissions were estimated to be 672,000 kt CO_2e in 2020. Ontario's contribution to national GHG emissions is 22%. The Ontario and Canadian transportation sector GHG emissions constitute 8% and 28% of the national total, respectively.

4.6 Noise and Vibration

The areas surrounding the Project Footprint in the City of Oshawa consist primarily of residential land uses. Some commercial, institutional, and industrial land uses are also present adjacent to the Project Footprint in the City. The acoustical environment adjacent to the Project Footprint in the City is typical of a major population centre, where the background sound level is dominated by the activities of people often referred to as “urban hum”. Major noise sources include Highway 401, south of the Project corridor, the existing CP rail tracks, and stationary noise sources such as air conditioning and heating sources servicing residential, commercial, and industrial buildings.

The areas surrounding the Project Footprint in the Municipality of Clarington consist primarily of rural land uses to the west and residential land uses to the east in the Town of Bowmanville. The acoustical environment adjacent to the Project Footprint, west of the Town of Bowmanville, is dominated by road traffic noise from Highway 401 to the south, major roadways adjacent to the Project Footprint, and the existing CP rail tracks. The acoustical environment in the Town of Bowmanville is similar to Oshawa where the background sound level is dominated by “urban hum”.

Impulsive noise can be described as any type of noise that carries a sudden sharp sound or a sudden bang for a short duration (e.g., a gunshot or a sledgehammer blow) (Murphy and King 2014). No impulsive noise sources are currently expected within the Project Footprint.

Intermittent sources of vibration from adjacent commercial and industrial activities including road traffic are present along the Project Footprint. In addition, vibration generated by passing freight trains along the CP rail tracks are also a source of vibration.

4.7 Socio-Economic and Land Use

The following section describes existing conditions related to the social and economic environment. This includes descriptions of the political and policy designations associated with the Socio-Economic and Land Use Assessment Area and the land uses allowed as a result. It also includes a description of the ways in which people use the land within the Socio-Economic and Land Use Assessment Area.

4.7.1 Planning Policy

Clarington Official Plan (2018)

The Clarington OP (2018) is created in accordance with the *Section 14.7 of the Planning Act, R.S.O. 1990, C. P. 13 (Planning Act 1990)* and is a legal document used to guide future physical development of the municipality with regards to land use and transportation, while considering the implications on the economic, environmental, cultural, physical, and social well-being on the residents of Clarington. The Clarington OP (2018) states that this document should inform other municipal plans, public works, and actions and should provide a framework to prevent and resolve land use conflicts while identifying opportunities for development. There are three principles outlined in the Clarington OP (2018), including sustainable development, healthy communities, and growth management.

The Clarington OP (2018) states that the development of transportation in the municipality must provide a full range of mobility options for people and goods by developing a transportation system that connects community amenities and fosters economic activity. The Clarington OP (2018) states that priority should be placed on public transit, walking, and cycling through the use of existing transportation infrastructure and aims to improve upon existing transportation system to create more walkable, transit supportive centres and corridors. Transportation options to and within Employment Areas should focus on multi-modal transportation options.

The Clarington OP (2018) states that development should be concentrated on Urban and Village Centres to increase economic, social, and cultural activities throughout communities within the municipality. The Clarington OP (2018) outlines the development of two Transportation Hubs in Courtice and Bowmanville, which should be high density, mixed-use areas to support transit expansion to Clarington. The development of Urban and Village Centres, Waterfront Places, Neighbourhood Centres, and the Transportation hubs should be conducted with a focus on civic squares, parks, walkways, and built forms and characteristics that align with the community.

Secondary Plans

The Clarington OP includes Secondary Plans, which provide guiding policies and land designations to facilitate growth and development within specific areas. The Socio-Economic and Land Use Assessment Area overlaps four Secondary Plans within Clarington municipality including Bowmanville West Town Centre Secondary Plan, the Bowmanville West Urban Centre and Major Transit Station Area Secondary Plan, the Southwest Courtice Secondary Plan, and the Brookhill Neighbourhood Secondary Plan. The Municipality of Clarington is currently studying a new Secondary Plan called the Courtice Transit Oriented Community and GO Station Area Secondary Plan.

Bowmanville West Urban Centre and Major Transit Station Area Secondary Plan

The Bowmanville West Urban Centre and Major Transit Station Area Secondary Plan is the proposed amendment to the Bowmanville West Town Centre Secondary Plan, which encompasses the land on the north and south sides of King Street and stretches to the east limit of the Urban Boundary. The new proposed updates to the Secondary Plan and zoning now include lands on the south side of the C.P. rail line on the north side of Aspen Springs Drive. The Secondary Plan provides goals, objectives, and policies to guide the development of the lands and transit expansion in the West Town Centre.

The Bowmanville West Urban Centre will be the concentrated centre of commercial and mixed-use development. The Bowmanville West Urban Centre and Major Transit Station Area Secondary Plan focuses new policies on promoting walkable neighbourhoods, attractive public spaces, and pedestrian-oriented transit. The plan also provides guidance on transit-oriented development, as well as commercial and residential developments.

Brookhill Neighbourhood Secondary Plan

The Brookhill Neighbourhood Secondary Plan area is bounded by Bowmanville West Town Centre to the south, Nash Road to the north, Bowmanville Creek valley to the east and the urban limit boundary of Bowmanville to the west. The plan is intended to provide a set of goals and policies to guide development within the Brookhill Neighbourhood as it is implemented through subdivision, zoning, and site plan control. The plan reflects the goals outlined in the Clarington OP (2018) and aims to facilitate an efficient, low energy neighbourhood while preserving the natural environment. The plan also aims to provide diverse housing options and create a central hub with a mix of uses.

An update of the Brookhill Neighbourhood Secondary Plan commenced in 2018, which replaces the previous Brookhill Neighbourhood Secondary Plan and Urban Design Guidelines that were approved in 2008. The update focuses on approximately 200 ha of land that is located north of the Longworth Avenue extension and is aligned with Provincial and local development policies and goals. Areas of improvement include street and building design, sustainable practices, and pedestrian-oriented connections to green spaces. The updated themes of the Brookhill Neighbourhood Secondary Plan focus on sustainability, environmental preservation, and healthy, complete community. The Clarington Council ratified the amendments to the Brookhill Neighbourhood Secondary Plan in May of 2021. The amended plan requires approval from Regional Municipality of Durham before coming into force. Review by Regional Municipality of Durham may result in further modifications to the Secondary Plan.

Southwest Courtice Secondary Plan

The Southwest Courtice Secondary Plan encompasses the area portions of land from both Bayview Neighbourhood and Penfound Neighbourhood. The area is bounded by Townline to the west, Robinson Creek to the east, Bloor Street to the North, and the Canadian Pacific rail corridor and Highway 401 to the south.

The Southwest Courtice Secondary Plan is aligned with the goals and policies set out in the Clarington OP, with the purpose to establish policies and guidance for the development of the southern portion of Bayview Neighbourhood, as it is implemented through subdivision, zoning, and site plan control. The core principles of the Southwest Courtice Secondary Plan include:

- Support life quality in all households
- Protect and enhance the natural environment
- Incorporate environmental sustainability
- Conserve cultural heritage resources
- Improve connections to broader community
- Encourage social interaction and outdoor activity
- Create distinct community character
- Develop neighbourhood in an orderly fashion

Courtice Transit-Oriented Community and GO Station Area Secondary Plan

The Courtice Transit-Oriented Community and GO Station Area Secondary Plan was initiated by the Municipality of Clarington in 2019 (Municipality of Clarington 2022). The proposed Secondary Plan area is bounded approximately by Robinson Creek in the west, Bloor Street in the north, Tooley Creek and Highway 418 in the east, and Highway 401 in the south. The Transit-Oriented Community and GO Station Area Secondary Plan is subject to Schedule ‘C’ of the Municipal Class Environmental Assessment process and a study is currently underway to identify environmental effects of the new Secondary Plan. Development in this area was previously restricted by the absence of sanitary sewers in south Courtice, however the provision of municipal services and transit expansion will be the catalysts for growth in the Secondary Plan area. Once complete, the Secondary Plan will guide the area’s growth as it transforms into a major employment, mixed-use, and transportation hub for Courtice.

Oshawa Official Plan (1987)

The Oshawa OP was created in accordance with the *Section 14.7 of the Planning Act, R.S.O. 1990, C. P. 13 (Planning Act 1990)* and is a set of policies and land use designations aimed to guide the development pattern of the City of Oshawa. The Oshawa OP was adopted by Durham Regional Council on November 20, 1985 and approved by the Minister of Municipal Affairs on February 12, 1987 with modifications. Subsequent amendments to the OP approved/modified by the Regional Municipality of Durham and the Local Planning Appeal Tribunal were last consolidated in April 2021. The current consolidated Oshawa OP (2022a) was reviewed for information relevant to this Project.

The Oshawa OP (2022a) states that land use should be focused on Central Areas, with the primary concentrations of well-designed, compact, and intensive urban development taking place within these central locations. The main Central Area is designed around Simcoe Street and King Street, which encompasses the Downtown Oshawa Urban Growth Centre (UGC) and the Central Oshawa Transportation Hub. The Oshawa OP states that there should be a balance of employment and residential growth within the Central Area, including a variety of shops, businesses, community resources, cultural resources, recreational uses, and transportation facilities, as well as mixed high density residential housing types.

The Oshawa OP (2022a) outlines a focus on high density, mixed-use, pedestrian-oriented, transit-supportive development through the implementation of corridors within urban areas. These corridors support walking, cycling, and transit routes and reinforce the linkages between major urban areas by using key arterial roads throughout the city.

The Oshawa OP (2022a) supports efficient multi-modal transportation through development that complements and optimizes the lands surrounding transit services. Transportation hubs should support high density working, living, shopping and/or leisure activities in high connectivity areas and should provide increased accessibility, comfort, convenience, and safety for pedestrian traffic.

Secondary Plans

The Oshawa OP (2022a) includes one Secondary Plan for the Samac Community, which provide guiding policies and land designations to facilitate growth and development within the Samac Community. The Socio-Economic and Land Use Assessment Area does not overlap the Secondary Plan for the Samac Community.

4.7.2 Neighbourhood Profiles

The following sections provide information on existing residential, commercial, mixed use, institutional, employment, and park and recreational use areas overlapped by the Socio-Economic and Land Use Assessment Area.

This section provides summary 2021 demographic information and population data where available from Statistics Canada (Statistics Canada 2023a, 2023b). The locations of neighbourhoods, relative to the Project Footprint and Socio-Economic and Land Use Assessment Area, are illustrated in Appendix A5.

Whitby South

A very small portion of the Whitby South neighbourhood is included in the Socio-Economic and Land Use Assessment Area, consisting of a commercial building housing several businesses. There are no schools, recreational facilities, or residential areas included within the Socio-Economic and Land Use Assessment Area.

Lakeview

Lakeview is a neighbourhood south of Highway 401 along Lake Ontario and includes three secondary schools, five elementary schools and a number of recreational facilities. In 2021, the total population of Lakeview was 18,720 persons an increase of 3.2% from 2016. In 2021, approximately 18.3% of the population were children (0-14 years), 11.4% youth (15-24 years), 58.1% working age (25-65), and 12.5% seniors (65+ years).

Gibb West

Gibb West is a neighbourhood between Highway 401, Highway 2, the Whitby border and Oshawa Creek. Gibb West has several prominent features including the Oshawa Centre, Durham Alternative Secondary School and four elementary schools. In 2021, the total population of Gibb West was 11,635 persons, an increase of 2.3% from 2016. In 2021, approximately 15.5% of the population were children (0-14 years), 10.0% youth (15-24 years), 58.3% working age (25-65), and 16.3% seniors (65+ years).

Downtown Oshawa

Downtown Oshawa includes the areas of King Street and Simcoe Street, it is bounded by Highway 401 in the south and Adelaide Street to the north, Oshawa Creek to the west and Ritson Road on the east. The neighbourhood includes the Oshawa City Hall, Oshawa Public Library and three elementary schools, parts of the University of Ontario Institute of Technology (OUIT). In 2021, the total population of Downtown Oshawa was 11,094 persons, an increase of 2.2% from 2011. In 2011, approximately 13.9% of the population were children (0-14 years), 13% youth (15-24 years), 54.3% working age (25-65), and 18.5% seniors (65 years).

Central Park

Central Park extends from Highway 401 to Adelaide Avenue between Ritson Road and Harmony Road. There are three elementary schools within the neighbourhood. In 2021, the total population of the neighbourhood was 11,856 persons, an increase of 5.1% from 2016. In 2021, approximately 15.1% of the population were children (0-14 years), 9.0% youth (15-24 years), 57.7% working age (25-65), and 17.9% seniors (65 years).

Grandview South

Grandview South extends from Highway 401 to Adelaide Avenue and is bounded between Harmony Road and Townline Road. The neighbourhood includes Grandview Children's Centre, Eastdale Collegiate and Vocational Institute, and three elementary schools. In 2021, the total population of the neighbourhood was 11,337 persons, an increase of 0.31% from 2016. In 2021, approximately 14.9% of the population were children (0-14 years), 9% youth (15-24 years), 54.2% working age (25-65), and 21.7% seniors (65 years).

Courtice South

Courtice South extends from the Oshawa border to Courtice Road. This neighbourhood includes Holy Trinity Catholic Secondary School and five elementary schools. In 2021, the total population of the neighbourhood was 17,201 persons, an increase of 29.9% from 2016. In 2021, approximately 19.8% of the population were children (0-14 years), 13.2 youth (15-24 years), 56.6% working age (25-65), and 10.3% seniors (65 years).

Darlington

Darlington includes the boundaries of the old county of Darlington, excluding the town areas of Courtice and Bowmanville. Three elementary schools, Darlington Provincial Park and the Darlington Nuclear Generating Station are located in this neighbourhood. In 2021, the total population of the neighbourhood was 14,315 persons, an increase of 24.6% from 2016. In 2021, approximately 20.5% of the population were children (0-14 years), 10.2% youth (15-24 years), 51.2% working age (25-65), and 18.1% seniors (65 years).

Bowmanville South

Bowmanville South extends from Lake Ontario to Highway 2, with a small area extending north of Baseline Road. This neighbourhood includes Lakeridge Health Bowmanville and five elementary schools. In 2021, the total population of the neighbourhood was 16,893 persons, an increase of 22.9% from 2016. In 2021, approximately 17.8% of the population were children (0-14 years), 11.5% youth (15-24 years), 55.0% working age (25-65), and 15.7 seniors (65 years).

Bowmanville North

Bowmanville North is bounded by Concession 3 to the north, Lambs Road to the east, the railroad line to the south and Regional Road 57 to the west. The Bowmanville Valley, St. Stephen's Secondary School, three elementary schools and a number of private schools are located within the neighbourhood. In 2021, the total population of the neighbourhood was 13,788 persons, an increase of 52.6% from 2016. In 2021, approximately 23.3% of the population were children (0-14 years), 11.3% youth (15-24 years), 55.2% working age (25-65), and 10.1% seniors (65 years).

4.7.3 Existing Land Use and Development Applications

Development applications for Oshawa properties located within the Socio-Economic and Land Use Assessment Area are presented in Table 4.8. There are no active development applications within the Assessment Area in the Municipality of Clarington.

Table 4.8: Development Applications within the Socio-Economic and Land Use Assessment Area

Street #	Street	Proposal	Type of Application	Status
N/A	Dean Avenue opposite Normandy Street	88 stacked townhouses	Site Plan Approval, Draft Plan of Condominium	Under construction.
N/A	NW Corner Stevenson Road South & Champlain Avenue	Parking lot for the storage of new vehicles	Site Plan Approval	Application is in process.
39	McGrigor Street	33-unit apartment building	Site Plan Approval	Application is in process.
63	Albany Street	6 storey, 99-unit apartment building	Zoning By-law Amendment	Zoning approved in 2019.
64	Albany Street	11 storey, 100-unit apartment building	Zoning By-law Amendment	Zoning approved in 2020.
426	Front Street			
135	Bruce Street	Rezoning to permit 2,145 apartments, 96 townhouses & limited commercial uses	Zoning By-law Amendment	Zoning By-law Amendment for Phase 1 to permit the construction of 509 apartment units has been approved. Not yet under construction. Rezoning for the balance of the site remains in process.
223	Albert Street	New 10-unit apartment building	Site Plan Approval	Application is in process.
227	Simcoe Street South	New commercial development including an office, retail & soup kitchen	Site Plan Approval	Under construction.
250	Harmony Road South	212 townhouses	Site Plan Approval	Under construction.
255	Tresane Street	New 4-unit apartment building	Site Plan Approval & Part Lot Control	Application is in process.
446	Simcoe Street South	New 50-unit apartment building	Site Plan Approval	Application is in process.

Street #	Street	Proposal	Type of Application	Status
480,484,490,506	Ritson Road South	40 stacked townhouses	Zoning By-law Amendment	Application is in process.
485	Normandy Street	50 stacked townhouses	Site Plan Approval	Application is in process.
505	Simcoe Street South	Create a severed lot to the east, retaining lands with apartment building to the west	Land Division	Application is in process.
642	Champlain Avenue	New self-storage facility	Site Plan Approval	Under construction.
883	Thornton Road South	New 40, 877 metres squared (m^2) warehouse building	Site Plan Approval	Under construction.
63	Albany Street	New 99-unit apartment building	Zoning By-law Amendment	Zoning approved.
10	Aspen Springs Drive	One nine-storey mid-rise building and one 25-storey twin-tower mixed-use building, featuring 607 residential units and approximately 625 square metres of ground-floor commercial space	Zoning By-law Amendment	Application is in process.
46	Stevens Road	A seven-storey assisted care facility, an eight-storey assisted care facility, a 10-storey multi-unit building, and three townhouse blocks with 11 units.	Official Plan Amendment and Zoning By-law Amendment	Application is in process.

Street #	Street	Proposal	Type of Application	Status
1558	Green Road	Plan of subdivision with a total of 194 residential units consisting of 53 single-detached units, 36 townhouse units and two blocks with a total of 105 units, including stacked townhouses and mid-rise apartment buildings as well as blocks for Environmentally Protected lands.	Draft Plan of Subdivision and rezoning	Application is in process.
394	Simcoe Street South	Proposal to remove the existing hotel on site and add 10 residential units to the existing 25 residential units on the property.	Building permit	Application to be submitted.

Source: City of Oshawa, D. Sappleton, email message to author, July 6, 2021.; Municipality of Clarington. 2023.

4.7.4 Built Form and Visual Characteristics

The general visual character of the Land Use and Socio-Economic Assessment Area varies between urban/suburban with some park land, which transitions to agricultural lands and back to urban/suburban. The Assessment Area has level topography, with some areas of slight elevation. The Assessment Area includes small waterways, such as Darlington Creek, Harmony Creek, and Tooley Creek. The Socio-Economic Assessment Area also includes prominent natural features such as McLaughlin Bay Wildlife Reserve and Darlington Provincial Park. The general visual characteristics of nine neighbourhoods along the Project Footprint are described below.

Whitby South

The Socio-Economic and Land Use Assessment Area overlaps a small portion of the Whitby South neighbourhood. The rail corridor is surrounded by industrial areas to the north and south, which are interspersed with open spaces. The rail corridor is partially shielded by vegetation that parallels the tracks. However, train movements are visible in surrounding industrial areas. No segments of rail corridor within the Project Footprint overlap the Whitby South neighbourhood. There are no existing rail-road crossings in the section of the Whitby South neighbourhood that overlaps the Project Footprint.

Lakeview

The Socio-Economic and Land Use Assessment Area encompasses the Oshawa Station, including the accompanied parking lot. The rail corridor is surrounded by industrial and commercial areas to the north and south, with some open green space to the southeast. As the rail turns and heads northwest, the rail crosses over Highway 401 via an elevated crossing. The McLaughlin Bay Wildlife Reserve is located in the Lakeview neighbourhood. The segment of rail corridor within the Project Footprint is 0.6 km long in the Lakeview neighbourhood. Lakeview has an existing rail bridge within the Project Footprint: a rail bridge over Highway 401 and Bloor Street West. The existing bridge structure is visible to vehicles, cyclists, and pedestrians using Bloor Street west and vehicles on Highway 401.

Gibb West

The rail corridor enters the Gibb West neighbourhood crossing through open green space. The rail corridor is partially shielded by vegetation that parallels the tracks. There are commercial buildings to the north of the rail corridor, as well as to the west. As the rail corridor divert to the east, residential neighborhoods composed of multi-family homes to the north. The residential area is mostly shielded by vegetation that parallels the tracks. The rail corridor passes below Stevenson Road. Multi-family homes and Co-Operative homes are located to the south of the rail corridor after Stevenson Road, which are shielded by vegetation that parallel the tracks. Large open spaces and parks and multi-family homes are located to the north, which are only partially shielded by vegetation that parallel the tracks. The rail corridor passes below Park Road South, which marks the transition to single-family dwellings both to north and south of the tracks.

The tracks then pass over Oshawa Creek via an elevated crossing. The Joseph Kolodzie Oshawa Creek Bike Path runs underneath the rail bridge over Oshawa Creek. The segment of rail corridor within the Project Footprint is 2.7 km long in the Gibb West neighbourhood.

Downtown Oshawa

The rail corridor enters Downtown Oshawa with residential areas immediately to the north and south. The residential areas include both single-family dwelling and multi-unit dwellings, which transitions to commercial areas to the south as the rail approaches Simcoe Street. The existing tracks run below a bridge that carries Simcoe Street over the rail corridor. The residential and commercial areas are shielded by vegetation that parallels the tracks. The tracks then pass under the Albert Street bridge which carries the road over the rail corridor.

The Michael Starr Trail crosses the rail corridor via an at-grade crossing just east of Albert Street. The former Ontario Malleable Iron Company and Knob Hill Farms site is located east of Albert Street and south of the existing tracks. The former industrial site is followed by more residential areas to the north and south of the tracks. These residential areas are primarily single-family dwellings, with some multi-family units dispersed throughout. There are several parks throughout the residential areas to the north. The residential areas are shielded by vegetation that parallels the tracks; however, train movements may be visible to some residents. The rail corridor passes below Ritson Road South. After Ritson Road South, there is a commercial area to the south of the tracks, which is followed by high density residential areas. The residential area is primarily single-family dwellings. The residents are shielded by vegetation that parallels the tracks. The segment of rail corridor within the Project Footprint is 2 km long in the Downtown Oshawa neighbourhood. Many of the existing rail-road crossings in the Downtown Oshawa neighbourhood also border the Central Park neighbourhood.

Central Park

The rail corridor passes through residential areas to the north, which consists of primarily single-family dwellings. The rail corridor passes over Wilson Road South via an elevated crossing.

Following Wilson Road South, residential areas are located to the south of the rail corridor and consist of primarily single-family dwellings. There is a walking trail that crosses the tracks to connect Farewell Street over the tracks via a multi-use bridge.

The rail corridor then passes below Harmony Road South. Residential areas are partially shielded by vegetation that parallels the tracks. The segment of rail corridor within the Project Footprint is 0.8 km long in the Central Park neighbourhood.

Grandview South

The rail corridor enters the Grandview South neighbourhood in an area that consists primarily of single-family dwellings located to the north and northeast, as well as south of the tracks. As the rail corridor turns and begins travelling southeast, residential areas continue to the northeast and east of the tracks. Lands to the southwest of the tracks include open spaces and a golf course. The residential areas are shielded by vegetation that parallels the tracks; however, train movements may be visible. The rail corridor passes over Bloor Street East at-grade. The segment of rail corridor within the Project Footprint is 2.8 km long in the Grandview neighbourhood. Grandview South has three rail crossings: a rail bridge over Harmony Creek, a rail bridge over Farewell Creek, and an at-grade crossing at Bloor Street East.

Courtice South

Within the Socio-Economic and Land Use Assessment Area, the neighbourhood of Courtice South consists of agricultural lands to the northeast of the tracks, as well as a small portion of land to the southeast of the tracks. The existing tracks cross Prestonvale Road at-grade. The rail corridor is partially shielded by vegetation that parallels the tracks. The segment of rail corridor within the Project Footprint is 1 km long in the Courtice South neighbourhood.

Darlington

Within the Socio-Economic and Land Use Assessment Area, the Darlington neighbourhood consists of agricultural lands and industrial and commercial lots to both the north and south of the tracks. There are very few residential buildings, except for a few single-family homes north of the tracks. The rail corridor is paralleled by intermittent vegetation to the north and south of the tracks. There is a private at-grade rail crossing between Prestonvale Road and Trulls Road at Dom’s Auto Parts. The rail corridor crosses Trulls Road then passes below Courtice Road before turning and heading southeast. The rail corridor then crosses Baseline Road West at-grade. As the rail corridor approaches Highway 418, commercial areas are located to the south of the tracks. The rail corridor passes below Highway 418 and turns to the northeast. As the rail corridor approaches Rundle Road, there are a few single-family homes to the north and south. The rail corridor crosses both Rundle Road and Baseline Road West at-grade. The rail corridor continues towards Bowmanville and crosses Holt Road and Maple Grove Road at-grade.

The segment of rail corridor within the Project Footprint is 6.6 km long in the Darlington neighbourhood.

Bowmanville South

The Bowmanville South neighbourhood transitions from agricultural lands back to primarily residential areas, which consist of single-family homes to the north and multi-unit buildings to the south. The track is elevated slightly, as the topography changes to small hills. The rail corridor crosses over Green Road via an elevated crossing. The residential areas are shielded by vegetation that parallels the tracks to the north and south. As the rail approaches Bowmanville Avenue, multi-unit housing is located to the north and south. Residential buildings to the north are shielded by noise walls that parallel the tracks. There are also commercial areas to the north. The rail corridor passes below Bowmanville Avenue. The segment of rail corridor within the Project Footprint is 1.9 km long in the Bowmanville South neighbourhood.

Bowmanville North

The portion of the Bowmanville North neighbourhood within the Socio-Economic and Land Use Assessment Area consists of a church and a vegetation area. The rail corridor is not visible from the Bowmanville North neighbourhood and no segments of rail corridor overlap this neighbourhood.

4.7.5 Utilities

A preliminary list of the type and owners of utilities in the Project Footprint is presented in Table 4.9. Additional utilities may be identified as the Project progresses through detailed design.

Table 4.9: Utilities in the Project Footprint

Utility Type	Owners
Watermains, Sanitary Sewers and Storm Sewers	Regional Municipality of Durham, City of Oshawa, Maguire Water Supply, Municipality of Clarington, CP Rail, Metrolinx, Canadian National (CN) Rail
Pipelines and Gas	Enbridge Gas Inc.
Hydro, Railway Lighting and Street Lighting	Hydro One Inc. (HONI), GM of Canada/Bell, Oshawa Power & Utilities Company, CN Rail, CP
Communications	Rogers Communications Canada, Zayo Canada, Bell Canada

4.7.6 Source Water Protection

The Source Protection Information Atlas (MECP 2021d) identifies vulnerable areas for the protection of drinking water.

Several Highly Vulnerable Aquifer Areas (HVAs) were identified along the rail corridor and at the following GO stations: Fox Street (B1 Thornton's Corners East), Front Street (B2 Ritson), Courtice Road (B3 Courtice), Bowmanville Avenue (B4 Bowmanville). HVAs are highly saturated aquifers that are susceptible to contamination (CTC Source Protection Committee 2022).

An Event Based Area (EBA) was identified at the proposed Fox Street (B1 Thornton's Corners East) GO Station and the segment of track corridor that runs towards, and crosses, Oshawa Creek. An EBA is a modeled area that presents a risk to water intake protection zones. This area was identified due to the potential for pipeline fuel/oil spills into Oshawa Creek that has potential to contaminate water intakes in Lake Ontario (near the mouth of Oshawa Creek).

4.8 Traffic and Transportation

Traffic (i.e., vehicular, cyclist and pedestrian) and transportation elements of the environment encompass all infrastructure and activities that help people to move from place to place.

4.8.1 Existing Road Network

Focus Area B1: Fox Street (B1 Thornton's Corners East)

The roadways within Focus Area B1 are summarized in Table 4.10 based on functional class, posted speeds, number of lanes and parking.

Table 4.10: Fox Street (B1 Thornton's Corners East) Focus Area Roadways

Roadway Name	Functional Class	Number of Lanes	Posted Speed	Parking	Jurisdiction
Thickson Road	Arterial	4 Lanes (North South)	60 km/h	Not Permitted	Regional
Burns Street	Arterial	2 Lanes (East West)	50 km/h	Not Permitted	Municipal
Stellar Drive	Arterial	2-4 Lanes (East West)	60 km/h	Not Permitted	Regional
Champlain Avenue	Arterial	2 Lanes (East West)	60 km/h	Not Permitted	Regional
Kendalwood Road	Arterial	2 Lanes (North South)	50 km/h	Not Permitted	Municipal
Thornton Road	Arterial	2 Lanes (North South)	60 km/h	Not Permitted	Regional
Fox Street	Collector	2 Lanes (North South)	20-50 km/h	Not Permitted	Municipal
Stevenson Road	Arterial	4 Lanes (North South)	60 km/h	Not Permitted	Regional

Roadway Name	Functional Class	Number of Lanes	Posted Speed	Parking	Jurisdiction
Gibb Street	Arterial	2 Lanes (East West)	50 km/h	Not Permitted	Regional
Bloor Street	Arterial	2-4 Lanes (East West)	60 km/h	Not Permitted	Regional

Existing AM and PM peak period traffic volumes for the roadway network around the future GO station are illustrated in Figure 4.1.

Figure 4.1: Fox Street (B1 Thornton's Corners East) Existing Traffic Volumes

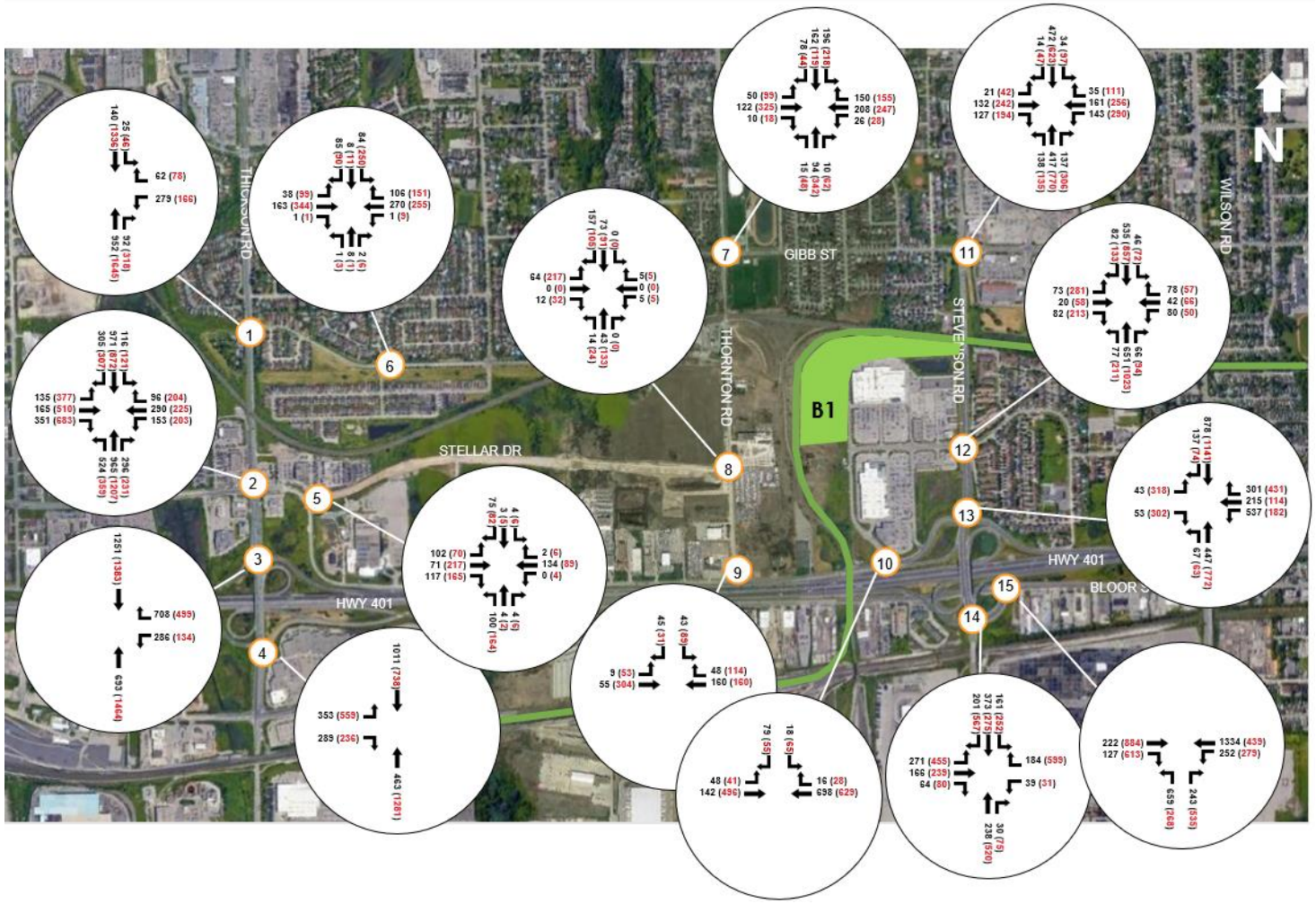


Table 4.11 shows the level of service analysis for Focus Area B1 intersections.

The following intersections were identified as operating at or close to capacity with a LOS rating of E or higher:

- **Thickson Road South / Stellar Drive / Consumers Drive** – In the AM peak period, the southbound approach operates with a v/c ratio of 0.93. And in the PM peak period, the eastbound left and right turn, westbound left-turn and southbound through movements operate with a v/c ratio of >0.96.
- **Stevenson Road South / Gibb Street** – In the PM peak hour, the westbound left-turn and northbound through movement operate at a v/c ratio of 0.93 and 0.94, respectively.
- **Stevenson Road South / Highway 401 (North Ramp)** – In the PM peak hour, the eastbound left, westbound right-turn and southbound through movements operate at a v/c ratio between 0.92 – 1.05.
- **Stevenson Road South / Highway 401 (South Ramp)** – In the PM peak hour, the eastbound right-turn, westbound right-turn and southbound left-turn movements operate at a v/c ratio of 0.92 – 1.11.

Table 4.11: Existing Intersection LOS for Fox Street (B1 Thornton's Corners East)

Node #	Intersection	AM			PM		
		V/C	Delay	LOS	V/C	Delay	LOS
1	Thickson Rd S / Burns St E	0.77	13.9	B	0.89	21.0	C
2	Thickson Rd S / Stellar Dr / Consumers Dr	0.93	43.6	D	1.05	55.0	D
3	Thickson Rd S / Hwy 401 (North Ramp)	0.72	18.6	B	0.71	13.1	B
4	Thickson Rd S / Hwy 401 (South Ramp)	0.64	17.0	B	0.64	13.9	B
5	Stellar Dr / Champlain Ave	0.58	9.4	A	0.37	11.4	B
6	Burns St E / Kendalwood Rd / Mt Pleasant Ave	0.41	9.5	A	0.60	14.8	B
7	Gibb St / Thornton Rd S	0.54	10.6	B	0.71	14.4	B
8	Thornton Rd S / Stellar Dr	0.17	9.1	A	0.36	15.3	B

Node #	Intersection	AM			PM		
		V/C	Delay	LOS	V/C	Delay	LOS
9	Thornton Rd S / Champlain Ave	0.16	8.6	A	0.37	9.8	A
10	Fox St / Champlain Ave	0.55	7.5	A	0.50	7.3	A
11	Stevenson Rd S / Gibb St	0.53	27.5	C	0.97	39.1	D
12	Stevenson Rd S / Laval Dr	0.38	14.2	B	0.84	27.4	C
13	Stevenson Rd S / Hwy 401 (North Ramp)	0.63	22.9	C	0.98	55.8	E
14	Stevenson Rd S / Hwy 401 (South Ramp)	0.42	27.4	C	1.07	83.1	F
15	Bloor St W / Hwy 401 (South Ramp)	0.84	17.3	B	0.80	25.3	C

Note: Shaded cells indicate intersections operating at LOS E or higher that were considered unacceptable.

Focus Area B2: Front Street (B2 Ritson)

The roadways within Focus Area B2 are summarized in Table 4.12 based on functional class, posted speeds, number of lanes and parking.

Table 4.12: Front Street (B2 Ritson) Focus Area Roadways

Roadway Name	Functional Class	Number of Lanes	Posted Speed	Parking	Jurisdiction
Gibb Street / Regional Road 59	Arterial	2 Lanes (East West)	50 km/h	Not Permitted	Regional
Park Road South / Regional Road 54	Arterial	4 Lanes (North South)	50 km/h	Not Permitted	Regional
Bloor Street East / Regional Road 22	Arterial	2-4 Lanes (East West)	50 km/h	Not Permitted	Regional
Olive Avenue / Regional Road 59	Arterial	2 Lanes (East West)	50 km/h	Not Permitted	Regional
Simcoe Street South / Regional Road 2	Arterial	4 Lanes (North South)	50 km/h	Not Permitted	Regional
First Avenue / McNaughton Avenue	Collector	2 Lanes (East West)	50 km/h	Not Permitted	Municipal

Roadway Name	Functional Class	Number of Lanes	Posted Speed	Parking	Jurisdiction
Albert Street	Collector/Local	2 Lanes (North South)	50 km/h	Not Permitted	Municipal
Ritson Road South / Regional Road 16	Arterial	4 Lanes (North South)	50 km/h	Not Permitted	Regional
Wilson Road South / Regional Road 35	Arterial	2 Lanes (North South)	50 km/h	Not Permitted	Municipal / Regional
Harmony Road / Regional Road 33	Arterial	4 Lanes (North South)	50 km/h	Not Permitted	Regional
Mill Street	Collector	2 Lanes (East West)	40-50 km/h	Not Permitted	Municipal
Dean Avenue	Collector	2 Lanes (East West)	50 km/h	Not Permitted	Municipal
Tennyson Avenue	Local	2 Lanes (East West)	20-50 km/h	Permitted	Municipal
Farewell Street	Arterial	4 Lanes (South of Hwy 401) 2 Lanes (North of Hwy 401)	60 km/h 50 km/h	Not Permitted	Regional / Municipal

Existing AM and PM peak period traffic volumes for the roadway network around Focus Area B2 are illustrated in Figure 4.2 and Figure 4.3.

Figure 4.2: Front Street (B2 Ritson) Existing Traffic Volumes (Boundary Road Network)

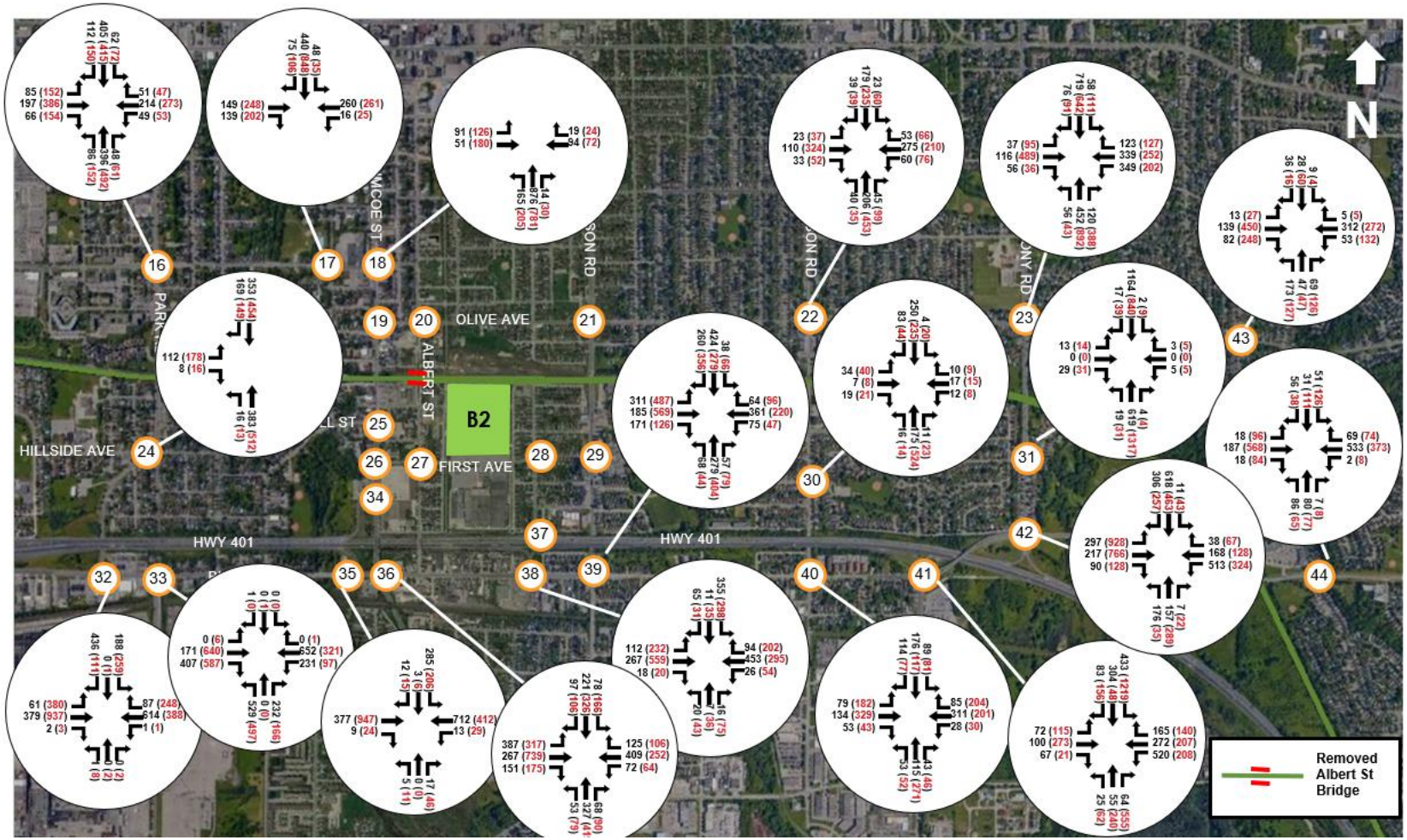


Figure 4.3: Front Street (B2 Ritson) Existing Traffic Volumes (Around GO Station)

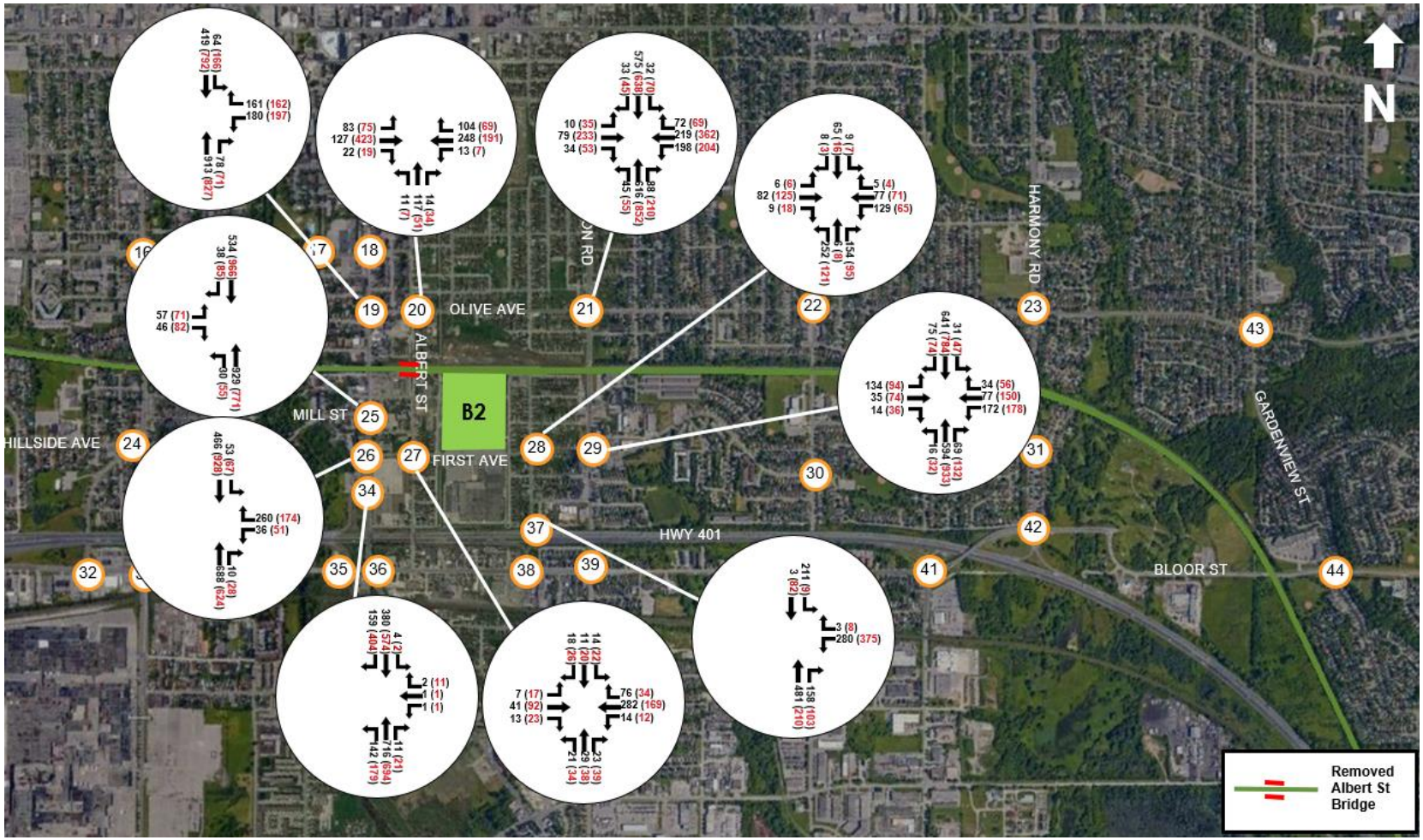


Table 4.13 show the level of service analysis for Focus Area B2 intersections.

Most of the study area intersections in Focus Area B2 are currently operating with acceptable levels of service. The following intersections were identified as operating at or close to capacity:

Tennyson Avenue and Harmony Road – In the PM peak, eastbound and westbound approaches, both stop-controlled, operate at LOS E and F, respectively, with high delays, however, the v/c ratio is below 0.35 for both.

Bloor Street West / Highway 401 East-bound Ramp (Simcoe) – At this stop-controlled intersection, in the AM peak, the southbound left-turn operates with a v/c ratio of 1.09 and at 0.95 in the PM peak.

Drew Street / Bloor Steet / Highway 401 Ramp – The stop-controlled westbound approach operates at LOS F with a v/c ratio of 1.79.

Bloor Street / Farewell Street/ Highway 401 Ramp – The westbound left-turn, northbound right-turn and southbound left-turn movements currently operate with v/c ratio of higher than 1.00 which attributes to the overall intersection LOS F and 90.6 seconds delay.

Bloor Street / Harmony Road – In the AM peak, eastbound left and through, westbound left, northbound left and southbound through movements operate with a v/c ratio of 0.94, and the overall intersection operates at LOS F with 123.3 seconds delay

Table 4.13: Existing Intersection LOS for Front Street (B2 Ritson)

Node #	Intersection	AM V/C	AM Delay	AM LOS	PM V/C	PM Delay	PM LOS
16	Gibb Street / Park Road South	0.32	16.9	B	0.51	21.0	C
17	Gibb Street / Centre Street	0.38	12.7	B	0.50	14.5	B
18	Gibb Street / Simcoe Street	0.43	12.6	B	0.46	12.7	B
19	Olive Avenue / Simcoe Street	0.64	17.7	B	0.73	22.7	C
20	Olive Avenue / Albert Street	0.40	10.8	B	0.46	9.8	A
21	Olive Avenue / Ritson Road South	0.61	16.5	B	0.87	30.0	C
22	Olive Avenue / Wilson Road South	0.46	14.6	B	0.64	15.7	B
23	Olive Avenue and Harmony Road	0.72	25.9	C	0.85	35.3	D
24	Park Road South / Hillside Avenue South	0.28	6.3	A	0.37	8.4	A
25	Mill Street / Simcoe Street	0.47	5.0	A	0.51	6.4	A
26	First Avenue / Simcoe Street	0.46	9.7	A	0.56	7.9	A
27	First Avenue / Albert Street	0.32	8.3	A	0.22	9.9	A
28	First Avenue / McNaughton Avenue / Drew Street	0.43	13.5	B	0.24	12.2	B

Node #	Intersection	AM V/C	AM Delay	AM LOS	PM V/C	PM Delay	PM LOS
29	McNaughton Avenue / Ritson Road South	0.61	14.8	B	0.80	17.1	B
30	Dean Avenue / Wilson Road South	0.33	7.3	A	0.54	6.9	A
31	Tennyson Avenue and Harmony Road	0.38	33.3	D	0.42	43.9	E
32	Bloor Street West / Park Road South	0.44	21.3	C	0.63	34.8	C
33	Bloor Street East / Park Road South	0.63	26.6	C	0.64	31.5	C
34	Simcoe Street / Hwy 401 WB Ramp	0.31	28.9	D	0.68	22.8	C
35	Bloor Street West / Hwy 401 EB Ramp (Simcoe)	1.09	24.3	C	0. 95	84.8	F
36	Bloor Street East / Simcoe Street South	0.68	21.8	C	0.71	24.3	C
37	Drew Street / Bloor Steet / Hwy 401 Ramp	1.79	107.4	F	0.68	22.8	C
38	Bloor St East / Hwy 401 (South Ramp- Ritson Interchange)	0.58	15.8	B	0.64	23.1	C
39	Ritson Road / Bloor Street	0.60	21.7	C	0.72	20.6	C
40	Wilson Road / Bloor Street	0.55	16.5	B	0.60	19.4	B
41	Bloor Street / Farewell St/ Hwy 401 Ramp	0.76	25.4	C	1.14	90.6	F
42	Bloor Street / Harmony Road	1.29	123.3	F	1.05	52.9	D
43	Olive Avenue and Grandview Street	0.50	12.1	B	0.55	10.8	B
44	Bloor Street and Grandview Street	0.63	13.6	B	0.62	17.4	B

Note: Shaded cells indicate intersections operating at LOS E or higher that were considered unacceptable.

Focus Area B3: Courtice Road (B3 Courtice)

The roadways within Focus Area B3 are summarized in Table 4.14 based on functional class, posted speeds, number of lanes and parking.

Table 4.14: Courtice Road (B3 Courtice) Area Roadways

Roadway Name	Functional Class	Number of Lanes	Posted Speed	Parking	Jurisdiction
Bloor Street	Arterial	2 Lanes (East West)	50-70 km/h	Not Permitted	Municipal / Regional
Grandview Street	Collector / Local	2 Lanes (North South)	20-50 km/h	Not Permitted	Municipal
Prestonvale Road	Arterial	2 Lanes (North South)	50 km/h	Not Permitted	Municipal
Trulls Road	Arterial	2 Lanes (North South)	50 km/h	Not Permitted	Municipal
Courtice Road	Arterial	2 Lanes (North South)	50-80 km/h	Not Permitted	Regional
Baseline Road	Arterial	2 Lanes (East West)	60 km/h	Not Permitted	Municipal

Existing AM and PM peak period traffic volumes for the roadway network around the future Courtice Road (B3 Courtice) GO Station are illustrated in Figure 4.4.

Figure 4.4: Courtice Road (B3 Courtice) Existing Traffic Volumes

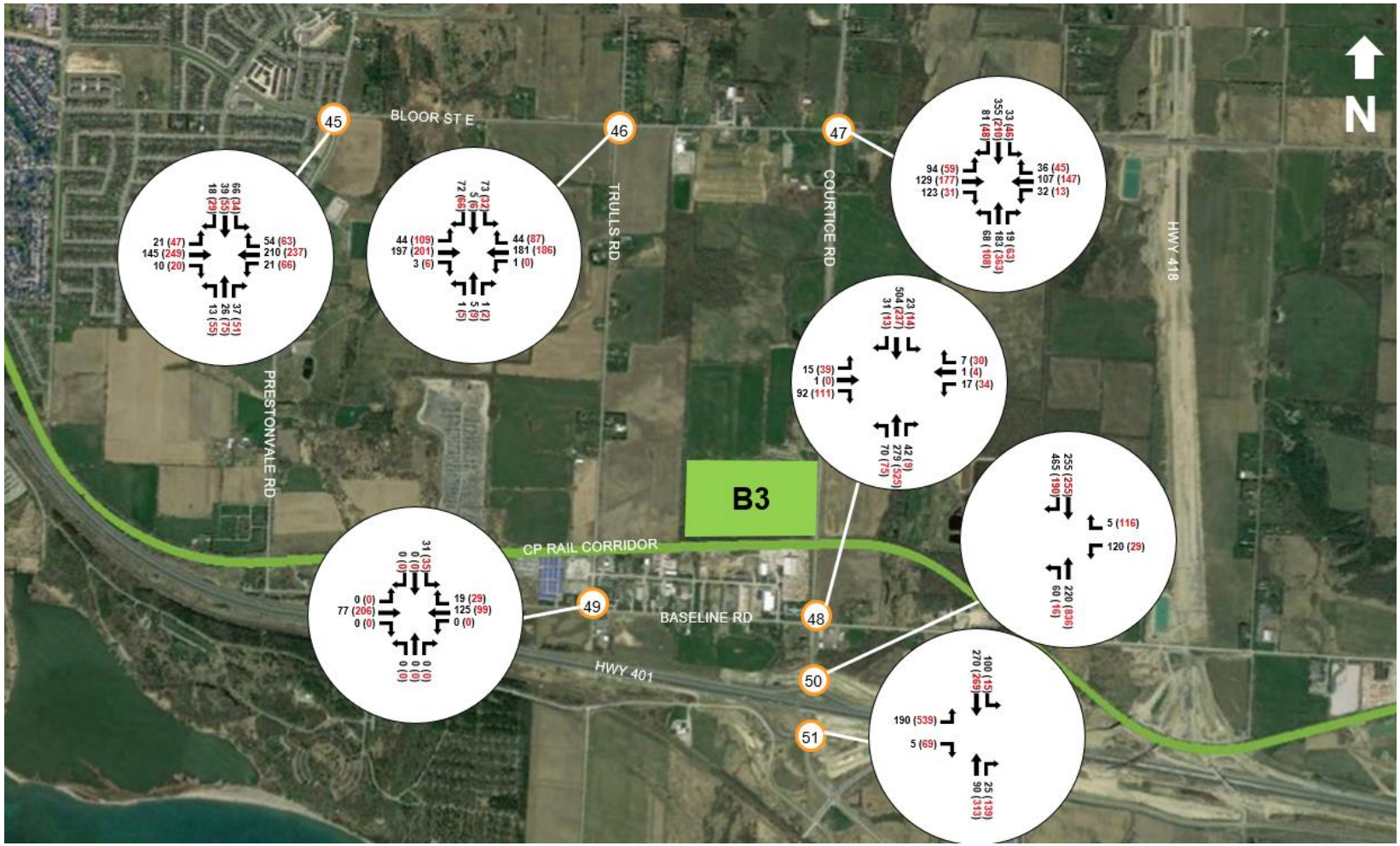


Table 4.15 shows the LOS analysis for Focus Area B3 intersections. All the TIA Assessment Area intersections in this Focus Area are operating with acceptable levels of service.

Table 4.15: Existing Intersection LOS for Courtice Road (B3 Courtice)

Node #	Intersection	AM			PM		
		V/C	Delay	LOS	V/C	Delay	LOS
45	Bloor Street and Prestonvale Rd	0.47	10.0	A	0.34	11.1	B
46	Bloor Street and Trulls Rd	0.29	13.3	B	0.22	14.1	B
47	Bloor Street and Courtice Rd	0.44	16.4	B	0.41	15.1	B
48	Baseline Rd and Courtice Rd	0.50	9.5	A	0.52	8.5	A
49	Baseline Rd and Trulls Rd	0.05	10.2	B	0.06	11.3	B
50	Hwy 401 and Courtice Rd (North Ramp)	0.35	9.0	A	0.68	9.2	A
51	Hwy 401 and Courtice Rd (South Ramp)	0.36	11.9	B	0.64	19.3	B

Focus Area B4: Bowmanville Avenue (B4 Bowmanville)

The roadways within Focus Area B4 are summarized in Table 4.16 based on functional class, posted speeds, number of lanes and parking.

Table 4.16: Bowmanville Avenue (B4 Bowmanville) Focus Area Roadways

Roadway Name	Functional Class	Number of Lanes	Posted Speed	Parking	Jurisdiction
Boswell Drive	Collector	2 Lanes (North South)	50 km/h	Not Permitted	Municipal
Green Road	Arterial	2 Lanes (North South)	50 km/h	Not Permitted	Municipal
Clarington Boulevard	Collector	2 Lanes (North South)	50 km/h	Not Permitted	Municipal
Bowmanville Avenue	Arterial	2 Lanes (North South)	60 km/h	Not Permitted	Municipal / Regional
King Street	Arterial	4 Lanes (East West)	50-60 km/h	Not Permitted	Municipal / Regional
Roenigk Drive	Collector	2 Lanes (North South)	50 km/h	Not Permitted	Municipal
Aspen Springs Drive	Collector	2 Lanes (East West)	50 km/h	Not Permitted	Municipal
Waverley Road	Collector	2 Lanes (North South)	20-50 km/h	Not Permitted	Municipal
Baseline Road	Arterial	2 Lanes (East West)	50 km/h	Not Permitted	Municipal
Spry Avenue	Local	2 Lanes (North South)	20 km/h	Not Permitted	Municipal

Roadway Name	Functional Class	Number of Lanes	Posted Speed	Parking	Jurisdiction
Energy Drive	Arterial	2 Lanes (East West)	50 km/h	Not Permitted	Municipal

Existing AM and PM peak period traffic volumes for the roadway network around the future Bowmanville Avenue (B4 Bowmanville) GO Station are illustrated in Figure 4.5.

Figure 4.5: Bowmanville Avenue (B4 Bowmanville) Existing Traffic Volumes

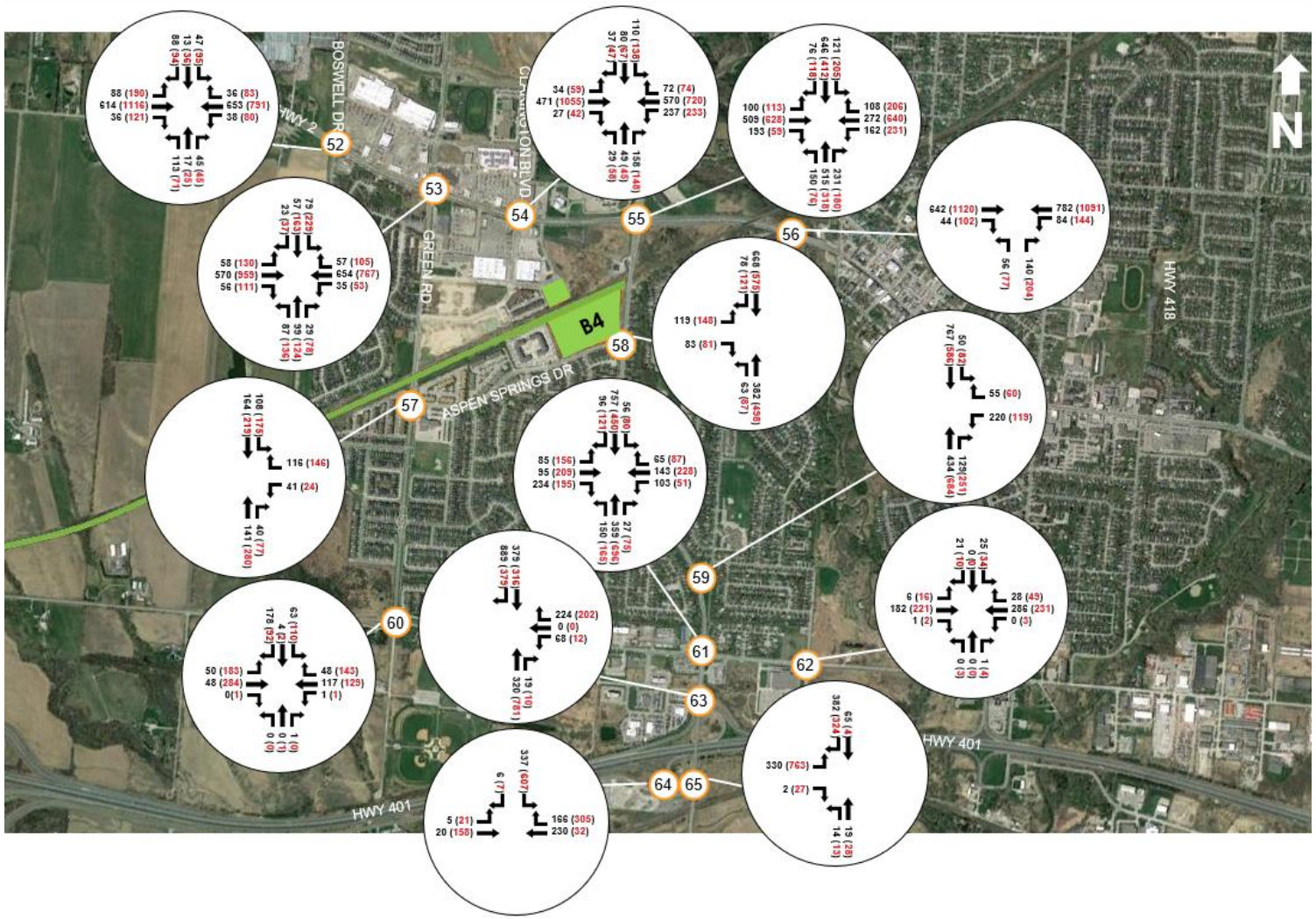


Table 4.17 shows the level of service analysis for Focus Area B4 intersections.

The following intersections were identified operating at LOS E or higher that were considered unacceptable:

Highway 2 / Bowmanville Ave – In the AM peak, the southbound through movement operates at v/c ratio of higher than 0.93.

Highway 401 / Energy Drive (East-bound Ramp) – At the stop-controlled intersection, the southbound approach operates at LOS F with a v/c ratio of 1.14 and excessive delays in the PM peak hour.

Table 4.17: Existing Intersection LOS for Bowmanville Avenue (B4 Bowmanville)

Node #	Intersection	AM			PM		
		V/C	Delay	LOS	V/C	Delay	LOS
52	Hwy 2 / Boswell Dr	0.41	8.7	A	0.61	16.7	B
53	Hwy 2 / Green Rd	0.39	10.3	B	0.72	21.7	C
54	Hwy 2 / Clarington Blvd	0.51	17.5	B	0.77	19.8	B
55	Hwy 2 / Bowmanville Ave	0.94	34.5	E	0.81	30.6	C
56	King St W / Roenigk Dr	0.36	7.0	A	0.57	15.0	B
57	Green Rd / Aspen Springs Dr (Roundabout)	0.22	-	A	0.32	-	A
58	Bowmanville Ave / Aspen Springs Dr	0.69	10.4	B	0.66	10.3	B
59	Bowmanville Ave / Waverley Rd	0.73	13.7	B	0.560	9.0	A
60	Baseline Rd / Green Rd	0.22	11.3	B	0.39	9.5	A
61	Bowmanville Ave / Baseline Rd W	0.63	18.0	B	0.60	19.7	B
62	Baseline Rd W / Spry Ave	0.22	4.1	A	0.22	4.9	A
63	Bowmanville Ave / Hwy 401 WB Ramp	0.59	20.7	C	0.69	36.8	E
64	Hwy 401 / Energy Dr (EB Ramp)	0.58	10.2	B	1.14	105.9	F
65	Bowmanville Avenue / Energy Dr	0.55	16.9	C	1.14	100.3	F

Note: Shaded cells indicate intersections operating at LOS E or higher that were considered unacceptable.

4.8.2 Transit Network

Focus Area B1: Fox Street (B1 Thornton's Corners East)

Local transit service is provided by Durham Region Transit (DRT) with regional transit service provided by GO.

DRT transit routes generally are destined to the Oshawa Centre Terminal located off Gibb Street, east of the proposed Fox Street (B1 Thornton's Corners East) GO Station.

The existing DC Oshawa GO is located south of Highway 401, west of Stevenson Road. There is a GO bus route serving the DC Oshawa GO and surrounding Park & Ride locations and some major intersections.

Key DRT bus routes operating in Focus Area B1 (as of April 2022) include:

- Route 405C along Thornton Road South and Gibb Street
- Route 392 along Stevenson Road
- Route 917 along Champlain Avenue and Stevenson Road
- Route 905A, 905B along Thickson Road
- Route 902A along Stevenson Road and Bloor Street

DC Oshawa GO provides commuter rail, passenger trail and regional bus services as the terminal station for the Lakeshore East line. GO bus service is provided at the First Avenue / Front Street Park & Ride facility.

Focus Area B2: Front Street (B2 Ritson)

Local transit service is provided by DRT with regional transit service provided by GO.

DRT transit routes generally are destined to the Oshawa Centre Terminal located off Gibb Street, west of the proposed Front Street (B2 Ritson) GO Station. The existing DC Oshawa GO is located south of Highway 401, west of Stevenson Road. There is a GO bus route serving the DC Oshawa GO and surrounding Park and Ride locations and some major intersections. GO Bus service is provided at the First Avenue / Front Street Park & Ride facility in close proximity of the proposed B2 GO Station.

Key DRT bus routes operating in this Focus Area (as of April 2022) include:

- Route 410 with service Gibb Street, Elm Avenue, and Olive Avenue
- Route 407A with service on Ritson Road South, Wilson Road South and Dean Avenue
- Route 403 and 411 with service on Park Road South
- Route 411 with service on Bloor Street East between Park Road South and Ritson Road South
- Route 901 and 901B with service on Gibb Street, Centre Street South, and Simcoe Street South

Focus Area B3: Courtice Road (B3 Courtice)

On-demand transit service is provided by DRT (as of April 2022) with regional transit service provided by GO.

There is a GO bus route serving the VIA Rail Oshawa train station and surrounding Park and Ride locations and some major intersections. GO Bus service is provided at the Courtice Road Park and Ride located at the proposed Courtice Road (B3 Courtice) GO Station location.

Focus Area B4: Bowmanville Avenue (B4 Bowmanville)

Local and on-demand transit service is provided by DRT with regional transit service provided by GO.

DRT operates Route 902A along Highway 2, Green Road and Clarington Boulevard. Route 502 in Bowmanville operates on weekdays with a 30-minute headway and connects to Route 902 in the vicinity of the future planned station (as of April 2022). DRT also provides on-demand service in Focus Area B4.

4.8.3 Cycling, Pedestrian and Trail Network

Focus Area B1: Fox Street (B1 Thornton's Corners East)

Focus Area B1 roadways generally accommodate pedestrians with most corridors providing sidewalks on one or both sides.

The Regional Cycling Plan 2021 identifies existing and future Primary Cycling Network (PCN) focusing on a 10-year horizon. The PCN provides varying facility types around the Focus Area.

Additionally, the City of Oshawa's Active Transportation Master Plan Technical Report (2015) identifies some existing and proposed on-road and off-road trails in Focus Area B1, such as along Gibb Street, Thornton Street, Laval Drive, and Stellar Drive Extension.

Focus Area B2: Front Street (B2 Ritson)

Focus Area B roadways generally accommodate pedestrians with most corridors providing sidewalks on one or both sides.

The Regional Cycling Plan 2021 identifies the proposed cycling facilities in the Focus Area.

Within the vicinity of Focus Area B2, the Michael Starr Trail is east of Albert Street and provides a north-south connection between Bruce Street in the north and Lviv Boulevard in the south. The Michael Starr Trail currently accommodates pedestrian and cycling movements across the CP Rail corridor through an at-grade crossing.

Additionally, the City of Oshawa's Active Transportation Master Plan Technical Report (2015) identifies some existing and proposed on-road and off-road trails, such as along Athol Street, John Street/Elmgrove Avenue, First Avenue/Dean Avenue, Front Street, Mill Street, Gibb Street and Olive Avenue.

Focus Area B3: Courtice Road (B3 Courtice)

Focus Area B3 roadways, located in a rural area, generally do not accommodate pedestrians with several corridors providing sidewalks on one or both sides.

The Regional Cycling Plan 2021 identifies the existing and future PCN focusing on a 10-year implementation horizon. The PCN provides varying facility types of routes and facility types around the Focus Area. Within the vicinity of Focus Area B3, the Waterfront Trail is just south of Highway 401 and provides a trail connection along Clarington's waterfront.

Focus Area B4: Bowmanville Avenue (B4 Bowmanville)

Focus Area B4 generally accommodates pedestrians with most corridors providing sidewalks on one or both sides.

The Regional Cycling Plan 2021 identifies existing and future PCN focusing on a 10-year implementation horizon. The PCN provides carrying facility types of routes around the Focus Area.

Within the vicinity of Focus Area B4, the Waterfront Trail is just south of Highway 401 and provides a trail connection along Clarington's waterfront.

Additionally, the Municipality of Clarington identifies some cycling routes starting from Bowmanville Indoor Soccer location along Baseline Road in the vicinity of the Focus Area.

4.9 Cultural Environment

The following sections describe existing conditions related to the cultural environment, including protected heritage properties, BHRs, CHLs, archaeological resources and areas of archaeological potential.

4.9.1 Built Heritage Resources and Cultural Heritage Landscapes

BHRs include buildings, structures, monuments, installations, or other similar features that contribute to a property's cultural heritage value or interest as identified by a community (Government of Ontario 2020b). A CHL is "a defined geographical area that may have been modified by human activity and is identified as having cultural heritage value or interest by a community, including an Indigenous community. The area may include features such as buildings, structures, spaces, views, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association. CHLs may be properties that have been determined to have cultural heritage value or interest under the *Ontario Heritage Act*, or have been included on federal and/or international registers, and/or protected through official plan, zoning by-law, or other land use planning mechanisms" (Government of Ontario 2020b).

During the field survey, a total of 1,527 properties were identified as containing potential BHRs (Appendix A7-1). This determination was based solely on the 40-year old threshold. The majority of these properties were located in mid-20th century subdivisions or were properties that had been heavily modified over the years, diminishing their heritage integrity. The potential for CHVI was identified through professional judgement, historical research, and evaluation following the MTCS *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes*. A total of 176 potential BHRs were identified within the Cultural Heritage Assessment Area following the application of the screening criteria. Each property was considered both as an individual BHR and as part of a larger potential CHL. Table 4.18 provides an overview of the identified built heritage resources and cultural heritage landscapes.

Further, as a result of the data requests to MTCS, OHT, City of Oshawa and Municipality of Clarington and review of municipal heritage registers, 42 protected built heritage resources and cultural heritage landscapes were identified as being located in the Cultural Heritage Assessment Area.

The Cultural Heritage Assessment Area also contains culverts that were screened for CHVI. The culverts identified within the Project Footprint were found to consist mostly of metal pipe culverts and concrete culverts. Based on a review of descriptions and photography, most were constructed between 1912 and the mid-20th century. Some culverts also appear to have been modified between the date of their construction and the present-day. The use of concrete in culvert construction began at the end of the 19th century and by the 1910s most railway companies constructed concrete culverts. The use of metal culverts began in the early 20th century. The culverts identified are typical early 20th to mid-20th century culverts and are not an early example of concrete or metal pipe construction techniques. The culverts are located on a section of the CP Rail corridor that was built in the early 20th century, which is not particularly early within the context of Southern Ontario. Therefore, the culverts are not historically associated with

a significant stretch of railway and are not particularly significant to CP Rail or the communities served by this CP Rail line. As utilitarian and functional structures, the culverts do not maintain or define the character of the area along the railway and are not physically, functionally, historically, or visually linked to their surroundings from a cultural heritage perspective. Therefore, these culverts were not considered to contain potential CHVI.

The Cultural Heritage Assessment Area spans several distinct areas including industrial areas, mid-20th century subdivisions, late 19th to early 20th century residential and commercial areas, modern subdivisions, and rural land. The portion of the Cultural Heritage Assessment Area west of Stevenson Road is predominantly industrial south of the CP Rail tracks. The character of this area is dominated by three important transportation corridors, the CP Rail tracks, Highway 401, and the CN tracks. North of the CP Rail tracks but west of Stevenson Road, the Assessment Area contains mostly semi-detached mid-20th century residences in a suburban landscape. Between Stevenson Road and Oshawa Creek, the Cultural Heritage Assessment Area consists mostly of detached residences in a suburban landscape. These suburban residences are associated with the postwar building boom experienced through much of southern Ontario in the mid-20th century. Between Oshawa Creek and Ritson Road the Assessment Area consist of a streetscape of late 19th to early 20th century residences and commercial structures associated with the growth of Oshawa in the late 19th and early 20th centuries as railways brought prosperity and industrial development to the city. Most of these structures are detached or semi-detached with the notable exception of the rowhouses along Olive Avenue. East of Ritson Road and to the City line, the Assessment Area contains mostly mid-20th century detached residences and modern subdivisions.

Within the Municipality of Clarington and west of Maple Grove Road, the Assessment Area contains industrial and commercial properties south of the CP Rail tracks and agricultural properties north of the CP Rail tracks. East of Maple Grove Road, the Assessment Area contains predominantly modern subdivisions.

The location of the BHRs and CHLs are shown on Figure 10 in Appendix A7-1. Full details on cultural heritage conditions can be found in Appendix A7-1.

The property at 500 Howard Street (BHR-115) is a provincial heritage property of provincial significance. A CHER was completed for 500 Howard Street by ERA in 2016 (refer to Appendix A7-10) and determined the site to contain CHVI. A statement of CHVI was prepared for the property and heritage attributes were identified (ERA 2022; Metrolinx 2016). As the property is a provincial heritage property of provincial significance, a Strategic Conservation Plan (SCP) was prepared by ERA on November 4, 2022 and was approved by MCM on November 25, 2022. The SCP provides guidance on conserving, maintaining, and using the property throughout the multi-year Front Street (B2 Ritson) GO Station project, to be delivered through Metrolinx's Transit Oriented Community Program. As required, a HIA was completed for the property by ERA on April 13, 2023 to fully understand potential for impact to this cultural heritage resource and to make specific conservation recommendations. MCM Minister’s Consent was received on May 26, 2023 for the demolition of Part 2.

Table 4.18: Identified Built Heritage Resources and Cultural Heritage Landscapes

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-1	Bridge	N/A—CP Rail Bridge over CN Tracks, Oshawa	Identified during field review	The bridge is a steel truss structure that carries the CP Rail tracks over the CN tracks and is located south of Bloor Street West. Additional details about the bridge are obscured by distance from roadway. The bridge was likely built between 1939 and 1953 based on aerial photography and topographic mapping. The bridge has potential design value as a representative mid-20th century truss bridge and late example of the style.	
BHR-2	Residence	555 Thornton Road South, Oshawa	Previously identified by Stantec in 2018 in the Bowmanville Corridor Expansion Cultural Heritage Screening Report (CHSR)	The property contains a one and one-half storey residence with a centre gabled dormer and an inverted finial. The residence has a red brick exterior with buff brick quoins and voussoirs with drip moulds. The residence has a pointed arch window in the centre gable and a covered front porch with side lights on both sides of the door. The foundation is obscured. The residence was built between 1861 and 1877 based on historical mapping. The residence has potential design value as a rare example of a 19th century Ontario vernacular residence with Gothic Revival and Italianate design influences that also displays a high degree of craftsmanship. The residence is one of only a few remaining 19th century structures in the area.	
BHR-3	Civic	99 Thornton Road South, Oshawa	Previously identified by Stantec in 2018 in the Bowmanville Corridor Expansion CHSR	The property contains the Oshawa Civic Centre and includes five outdoor fields, a full-size indoor fieldhouse, indoor and outdoor tracks, a swimming pool, fitness centre, indoor tennis courts, indoor squash courts, and an outdoor playground. The property has potential historical or associative value because of its significant connection to the community. The original arena was constructed in 1964 and was home to the local ice hockey team, the Oshawa Generals, from December 1964 to October 2006. The arena hosted the 1987 Memorial Cup and has also hosted large capacity music concerts including the Rolling Stones and Alice Cooper. Topographic mapping shows that the sports track and stadium seating date to *circa* 1976. The property also has significant contextual value as a landmark in the community.	

[30] Properties that are listed on the Heritage Oshawa Inventory of Heritage Properties are divided into “Class A” and “Class B” properties. Class A properties are considered to contain “very high potential for designation” and Class B properties are considered to contain “good potential for designation” (City of Oshawa 2022b).

Properties that are listed on the Clarington Heritage Inventory are divided into “Primary Properties”, “Secondary Properties”, and “Heritage Merit” properties. The Cultural Heritage Assessment Area contains Primary Properties and Heritage Merit Properties. Primary properties are considered “those that were the best examples of a particular style of architecture” and Heritage Merit Properties “retain the majority of their original architectural features but are not the best or second best examples of that architectural style in Clarington” (Municipality of Clarington 2022b).

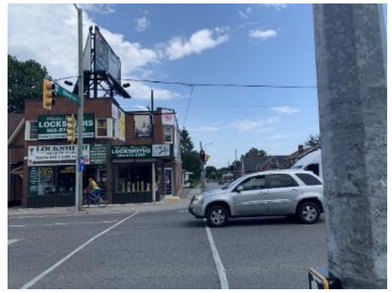
CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-4	Residence	254 Hibbert Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a steeply pitched side gable roof and two gable dormers on the front (south) elevation. The dormers are clad in modern siding and the windows have a rusticated concrete sill. The residence has a red brick exterior with rusticated concrete window and door surrounds. The residence has modern windows and doors. The foundation is concrete block. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early 20th century Ontario vernacular structure with Colonial Revival design influence.	
BHR-5	Residence	22 Royal Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a side gable roof and a front facing gable dormer on the south façade. The dormer is clad in modern siding and the exterior of the house is clad in red brick. The dormer has modern windows, while the first storey has wood frame 6/1 windows. There is a wooden door behind a modern screen door. The front entrance is within a recessed, covered front porch that spans approximately half of the front façade. The first storey front window and entrance to the front porch have plain rectangular lintels. The foundation is concrete block. The residence was likely built between 1911 and 1938 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-6	Residence	83 Avenue Street, Oshawa	Class A Listed Property on the Municipal Heritage Register	The property contains a residence. The residence is a one and one-half storey structure with a side gable roof and steeply pitched centre gable on the front (north) façade. There is a covered porch with a shed roof on the east façade with decorative wooden support beams. There also appears to be at least one addition at the rear of the structure. The residence is clad in modern siding with modern windows and doors. The front entrance has a decorative surround with pilaster and a rectangular pediment with a fan light. The foundation is obscured. The construction date associated with this residence in the Heritage Oshawa Inventory is 1880. This residence retains design value as a representative Gothic Revival structure. A CHER was completed for this property and determined the residence was built between 1912 and 1920 and is an Ontario vernacular structure with a centre gable commonly found in “Gothic Cottage” architecture in Ontario.	
BHR-7	Residence	50 Avenue Street, Oshawa	Identified during field review	The property contains a one storey residence with a front facing Dutch gable roof with the gable clad in modern siding. The exterior of the residence is red brick. The windows and door have segmental arch openings with brick voussoirs and sills. Half of the front (south) façade is a covered porch. The foundation is poured concrete. The residence was likely built between 1911 and 1938 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-8	Residence	33 Avenue Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	This property contains a two storey residence with a side gable roof with a brick chimney. The residence is clad in modern siding and contains modern windows and doors. The residence has a partial-width front porch and a stone foundation that has been whitewashed. This residence was likely built between 1880 and 1911 based on architectural style and fire insurance plans. The residence has potential design value as a representative Ontario vernacular structure.	
BHR-9	Residence	75 Hall Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with front gable roof. The exterior of the residence is red brick with matching brick lintels above the door and windows. The residence has a full-width front porch supported by red brick columns. The residence has a modern door and windows. The foundation is poured concrete. The residence was likely built between 1911 and 1938 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-10	Residence	71 Hall Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There is modern siding on the front gable and shed roof dormers on the side elevations. The residence has segmental arch door and window openings on the first storey with brick voussoirs. The residence has modern windows and doors. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on fire insurance plans and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-11	Residence	15 Hall Street, Oshawa	Identified during field review	The property contains a two and one-half storey residence with a hip roof and a hip dormer in the front (north) elevation. The exterior is red brick. The residence has a segmental arch door opening with a modern door and hip roof porch above the door with unelaborated square support columns. The residence has a four-pane square window on the front elevation with the other windows obscured by vegetation. The visible window and door have red brick voussoirs. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on fire insurance plans and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-12	Residence	346 Simcoe Street South, Oshawa	Identified during field review	This property contains a two and one-half storey residence with a hip roof and hip dormer on the front (east) elevation. The exterior is red brick. The residence has modern windows, a modern door, and an enclosed front porch. The south elevation contains a projecting bay clad in pebbledash. The foundation is concrete block and the west elevation contains an attached garage. The residence was likely built between 1912 and 1940 based on fire insurance mapping and architectural style. The residence has potential design value as a representative early to mid-20th century Ontario vernacular structure.	
BHR-13	Residence	356 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a one and one-half storey residence with a centre gable roof. The exterior of the residence is red brick with contrasting buff brick quoins, voussoirs, and edging around the door. The first storey windows are modern, with a pointed arch window on the upper storey. The door on the front (east) façade is modern with a rectangular stained-glass transom window above it and a decorative wood surround. There is a small, covered porch around the door with the roof supported by round columns. The foundation is cut stone. According to the Heritage Oshawa Inventory, the residence was constructed in 1880. The residence has value as a representative Gothic Revival structure.	
BHR-14	Residence	364 Simcoe Street South, Oshawa	Identified during field review	This property contains a residence. The residence is a two and one-half storey structure with a hip roof. The exterior is red brick and contains red brick quoins on the front (east) elevation. The residence has modern windows, a modern door, and partial width porch. The rear (west) elevation contains a modern addition. The foundation is poured concrete or stone with parging. The residence was likely built between 1880 and 1911 based on architectural style and fire insurance mapping from 1911. The residence has potential design value as a representative mid to late 19th century Ontario vernacular structure.	
BHR-15	Residence	370 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	This property contains a residence. The residence is a two and one-half storey structure with a hip and gable roof and projecting gable bay with bargeboard and decorative brick banding. The exterior is red brick. The residence contains a full-width front porch, modern windows, and a modern door. The front (east) elevation has been modified with a large picture window. The foundation is stone. The residence was likely built between 1880 and 1911 based on architectural style and fire insurance mapping. The residence has potential design value as a representative late 19th to early 20th century Ontario vernacular structure with Queen Anne design elements.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-16	Residence (converted to commercial)	394 Simcoe Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	This property contains a heavily modified residence converted to commercial use. The structure is three storeys tall and has a hip and gable roof. The structure is clad in modern stucco and contains modern windows and doors. The front (east) elevation has a modern storefront addition while the rear (west) elevation has a modern apartment complex attached. The residence was built between 1880 and 1911 based on architectural style and fire insurance mapping. The residence retains potential design value for remaining representative Queen Anne design elements. A CHER was completed for this property and determined this property contains a former residence later converted into a hotel that was built between approximately 1882 and 1891 The remaining original architectural details of the residence indicate the structure was an example of the Queen Anne style of architecture.	
BHR-17	Residence (converted to commercial)	442 Simcoe Street South, Oshawa	Identified during field review	The property contains a two storey residence with a front gable roof and modern siding in the gable. The exterior of the residence is red brick exterior with matching brick voussoirs above the windows. The residence has a modern door and windows. The foundation is below the street grade. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has design value and a representative early 20th century Ontario vernacular structure.	
BHR-18	Church	486 Simcoe Street South, Oshawa	Identified during field review	The property contains a one and one-half storey cross gabled church. The church has a red brick exterior. The window openings are a combination of pointed and round arches. The entry way is situated in a square tower with battlements along the roof line, an octagonal window, and a double door in a pointed arch opening with keystones. The date stone says the structure was built in 1930. This structure has potential design value as an early 20th century church with Gothic Revival design influences.	
BHR-19	Civic	505 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains the former South Simcoe School building, which has been converted into the St. George's Ukrainian Seniors Residence. The structure has three stories with a flat roof. The exterior of the structure is red brick. There is a large cornice below the roof line and stone banding above the first storey with decorative brick work on the west façade. The doors and windows are modern. The front entrance, on the west façade, is housed in a rectangular projection with red brick pillars at the corners, buff brick walls, and modern glass doors surrounded by large windows in an opening with a red brick border and keystone. The north, south, and east facades have multiple balconies. The foundation is poured concrete. According to the Heritage Oshawa Inventory, this structure was built in 1925. This structure has design value as a representative early 20th century Ontario vernacular school building and historical or associative value from its connection with the South Simcoe School.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-20	Residence	491 Simcoe Street South, Oshawa	Identified during field review	The property contains a two and one-half storey residence with a front gable roof. There is modern siding in the gable and a shed roof dormer on the north façade. The exterior of the structure is red brick. The residence has modern doors and windows with a bay window on the second storey. There is a full width covered front porch with red brick piers and half storey square columns. The foundation is poured concrete foundation. The residence was likely built between 1900 and 1930 based on the structure's style and topographic mapping. The structure has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-21	Civic	471 Simcoe Street, Oshawa	Identified during field review	This property contains a one storey structure. The structure is a one storey civic building with a flat roof. The exterior is clad in patterned concrete and red brick. The structure has modern windows and a modern door. The foundation is obscured. The building contains Branch 43 of the Royal Canadian Legion. The structure was built between 1950 and 1968 based on architectural style and topographic mapping. The structure has potential associative value for its role in the veterans' community of Oshawa.	
BHR-22	Residence	399 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a two storey residence with attic. The structure has a side gable roof with a red brick chimney and two steeply pitched, projecting gables on the front (west) façade. The projections span both stories and each have a fan shaped louvre in the gable. The exterior of the residence is clad in modern siding. The windows and doors are modern. The front entrance has a rectangular transom window above the door and a rectangular side light to the left. Above the main entrance is a modern door and balcony. According to the Heritage Oshawa Inventory, this residence was constructed in 1890. This residence has design value as a late 19th century Gothic Revival structure. A CHER was completed for this property and determined the structure at 399 Simcoe Street South is a *circa* 1900 Ontario vernacular structure with Bay and Gable and Gothic Revival influence.	
BHR-23	Church	373 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a two storey church with a front gable roof. The exterior of the church is red brick with a large brickwork and stone cross in the centre of the second storey of the front (west) façade. The west façade has additional decorative elements made from brick and stone as well as narrow, rectangular stained-glass windows with stone sills. The foundation of the building is obscured. According to the Heritage Oshawa Inventory, the church was constructed in 1950. The church has historic or associative value from its relationship to the Holy Cross Roman Catholic Church and community.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-24	Civic	357 Simcoe Street South, Oshawa	Class A Listed Property on the Municipal Heritage Register	The property contains a two storey building with a flat roof. The exterior of the building is red brick. The front (west) façade has stone window surrounds, vertical stone banding and stone decoration. The front façade also features twelve pane windows in groups of three. The front entrance is a double metal door with a large, rectangular transom window above it in a stone surround. There is no visible foundation. According to the Heritage Oshawa Inventory, the construction date for this building was 1942. The building has design value as a representative early 20th century Ontario vernacular civic structure and historical or associative value from its connection of the Holy Cross School and community.	
BHR-25	Commercial	335-339 Simcoe Street South, Oshawa	Identified during field review	This property contains a two storey commercial structure. The building has an irregular shape and a flat roof with a parapet cornice. The exterior of the building is red brick with matching red brick voussoirs above the windows and contrasting buff brick sills. The windows and doors are modern and the first storey contains large shop windows on the west and south facades. The foundation is poured concrete. The building was likely built between 1954 and 1968 based on aerial photography and topographic mapping. The building has potential design value as a representative mid-20th century Ontario vernacular commercial structure.	
BHR-26	Residence (converted to commercial)	325 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a one and one-half storey residence with a centre gabled roof and a one storey shop addition on the front (west) façade with a flat roof. The exterior of the original residence is brick in a stretcher bond pattern with brick voussoirs above the window openings, which contain modern windows. The one storey addition has a brick exterior in a stack bond arrangement with two large shop windows and a concrete block foundation. The foundation of the original residence is poured concrete. According to the Heritage Oshawa Inventory, the residence was constructed in 1900. The residence has potential design value as a representative early 20th century Gothic Revival structure.	
BHR-27	Residence	291 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a three storey apartment building with a flat roof. The exterior of the building is red brick with darker brick banding on the first storey and darker brick voussoirs on the second storey. The third storey is covered in stucco. The windows are modern. The building has double wooden doors with a stained-glass transom window inside a stone surround on the front (west) façade. There is no visible foundation. According to the Heritage Oshawa Inventory, the building was constructed in 1930. The building has potential design value as a representative early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-28	Residence	7 Maple Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence. The residence has a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above the window and door openings. The windows and doors are modern. The front (north) façade has a full width covered porch with metal work support beams and railings. The foundation is poured concrete. Residence was likely built between 1900 and 1911 based on the style and fire insurance plan. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-29	Residence	11 Maple Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gabled roof. The exterior of the residence is red brick with matching brick voussoirs above the window and door openings. The residence has a modern door and windows. The first storey window on the front (north) façade has a transom window above it. The residence has a stone foundation. The residence was likely built between 1900 and 1911 based on the style and fire insurance plan. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-30	Residence	13 Maple Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The gable is covered with shingles and the exterior of the residence is red brick. The residence has matching brick voussoirs and stone sills with segmental arch window and door openings. The windows and doors are modern. The front entrance (on the north façade) has a triangular pediment with decorative brackets and bargeboard in the gable. The foundation is rusticated concrete block. The residence was likely built between 1911 and 1931 based on fire insurance mapping and city directories. The residence has potential design value as a representative early to mid-20th century Ontario vernacular structure.	
BHR-31	Residence	15 Maple Street, Oshawa	Identified during field review	The property contains a two and one-half storey residence with a front gable roof. The gable is filled with modern siding. The exterior of the residence is red brick with matching brick voussoirs above the window openings. The residence has modern doors and windows with a bay window on the side (east) façade. There is a half width covered porch on the front façade. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design influence as a representative early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-32	Residence	21 Maple Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a one and one-half storey residence with a side gable roof. The exterior of the residence is brick with decorative banding on the upper storey and brick voussoirs above the window openings. The windows and doors are modern. The front (north) façade of the residence has a small shed roof entrance room that spans approximately 2/3 of the house. The foundation is poured concrete. According to the Oshawa Heritage Inventory, the residence was constructed in 1900. The residence has design value as a representative early 20th century Ontario vernacular structure.	
BHR-33	Residence	296 Celina Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above the door and window openings. The windows and door are modern. There is a full width covered porch on the front (east) façade supported by brick pillars with square half columns. The foundation is rusticated concrete block. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-34	Residence	298 Celina Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above the door and window openings. The windows are modern. There is a full width covered porch on the front (east) façade supported by pillars with square half columns. The foundation is rusticated concrete block. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-35	Residence	302 Celina Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above the door and window openings. The windows are modern. There is a full width covered porch on the front (east) façade supported by brick pillars. The foundation has faux stone panels covering rusticated concrete blocks. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-36	Residence	304 Celina Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above the door and window openings. The windows and door are modern. There is a full width covered porch on the front (east) façade supported by brick pillars. The foundation is rusticated concrete block. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-37	Residence	326 Celina Street, Oshawa	Identified during field review	The property has a one and one-half storey residence with a clipped gable roof. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings. There is a gable dormer on the side (south) façade. The windows are modern. The foundation is poured concrete. The residence was likely built between 1932 and 1951 based on city directories. The residence has potential design value as a representative mid-20th century Ontario vernacular structure.	
BHR-38	Residence	301 Celina Street, Oshawa	Identified during field review	This property contains a residence. The residence is a two and one-half storey structure with a front facing gable roof, return eaves, and a shed roof dormer on the south façade. The exterior is clad in modern siding and red brick. The residence contains modern windows, a modern door, and a full-width front porch. The foundation is poured concrete. The residence was likely built between 1912 and 1930 based on fire insurance mapping and architectural style. The residence has potential design value as an early 20th century Ontario vernacular structure with Edwardian design elements.	
BHR-39	Residence	19 Olive Avenue, Oshawa	Identified during field review	This property contains a residence. The residence is a two storey structure with a side gable roof and brick chimney. The exterior is red brick. The residence contains modern windows and the first storey has stone window and door surrounds. The foundation is rusticated concrete block. The residence was likely built between 1946 and 1968 based on topographic mapping. The residence has potential design value as a mid-20th century Ontario vernacular structure with Colonial Revival design elements.	

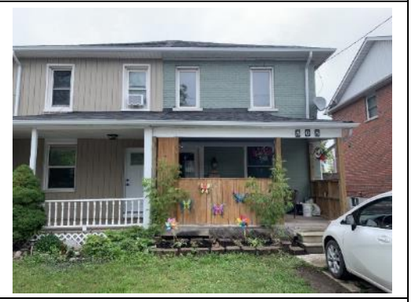
CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-40	Residence	25 Olive Avenue, Oshawa	Identified during field review	This property contains a residence. The residence is a one and one-half storey structure with a side gable roof and two gable dormers on the front (north) façade. The residence contains a modern shed roof rear addition. The residence is clad in red brick and modern siding. The residence has stone window and door surrounds, modern windows, a modern bay window on the west elevation, and a modern door. The foundation is poured concrete. The residence was likely built between 1946 and 1968 based on topographic mapping. The residence has potential design value as a mid-20th century Ontario vernacular structure with Colonial Revival design elements.	
BHR-41	Residence	29 Olive Avenue Oshawa	Identified during field review	This property contains a residence. The residence is a one and one-half storey structure with a side gable roof, brick chimney, and two gable dormers on the front (north) façade. The exterior is red brick. The residence contains modern windows and a modern door. The foundation is poured concrete. The residence was likely built between 1946 and 1968 based on topographic mapping. The residence has potential design value as a mid-20th century Ontario vernacular structure with Colonial Revival design elements.	
BHR-42	Civic	33 Olive Avenue, Oshawa	Identified during field review	The property contains a one storey building with a side gable roof and brick chimney. The building is attached to the church at 348 Albert Street. The exterior of the building is red brick with brick columns on either side of a vertical band of modern siding at the centre of the north façade and west façade. The windows and doors are modern. The foundation is poured concrete. The date stone at the northeast corner of the building says it was constructed in 1960. The building has potential design value as a vernacular structure with mid-century modern design influences and potential historical and associative value due to its connection to the New Life Seventh Day Adventist Church and the New Life Neighbourhood Centre, and the wider community.	
BHR-43	Church	348 Albert Street, Oshawa	Identified during field review	This property contains a church. The church is a two storey structure with a steeply pitched front facing gable roof. The exterior of the church is red brick. The front (north) façade contains two projecting gable bays with modern double entrance doors and transoms. Between the bays is a multi-storey former window opening with modern windows and a stylized cross. The west and east elevations contain projecting gable bays and modern pointed arch windows. The church was built in 1928 according to its cornerstone. It has potential design value as a representative Neo-Gothic church. The building has potential historical and associative value due to its connection to the New Life Seventh Day Adventist Church and community.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-44	Commercial	64 Albany Street, Oshawa	Identified during field review	The property contains a one storey commercial building. The building has a flat roof with a red brick exterior. There is a decorative brick band below the roof. The building has glass block windows and a modern door with a triangular pediment above it. The foundation is concrete block. The building was likely built between 1934 and1954 based on topographic mapping and aerial photography. The building has potential design value as a representative mid-20th century Ontario vernacular commercial structure.	
BHR-45	Residence	45 Albany Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence. The residence has a side gable roof with a centre gable dormer. The exterior of the residence is painted brick with a brick voussoir above the upper storey window. The residence has modern windows and a wooden door. There is a full width covered front porch with decorative wooden elements and square wooden support columns. The porch also has wooden railing with finials. The foundation is obscured. The residence was likely constructed between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative Gothic revival structure.	
BHR-46	Residence	30 Elena Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with front gable roof. There is a patterned brick design in the gable, an inverted finial at the peak and decorative wood elements in the corners of the gable. The windows and door are modern. There is one segmental arch window opening on the first storey and brick voussoirs above all window openings on the front façade. There is a half width covered front porch with square support columns and spindle railing. The foundation is obscured. The residence was likely built between 1900 and1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-47	Residence	21 Elena Avenue, Oshawa	Identified during field review	The property contains a two and one and one-half storey residence with a front gable roof. There is siding in the gable. The exterior of the residence is red brick. The windows and doors are modern, including a bay window on both the first and second stories. There is a small porch at the front (north) entry covered with a triangular pediment and supported by square brick columns. There is a concrete block foundation. The residence was likely built between 1900 and 1930 based on its style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

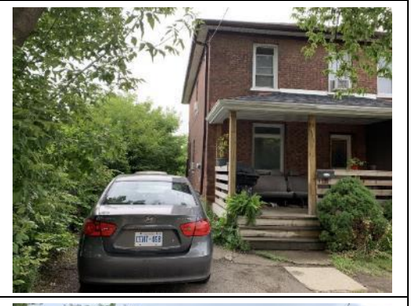
CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-48	Residence	25 Elena Avenue, Oshawa	Identified during field review	The property contains a two and one and one-half storey residence with a front gable roof. There is siding and two six pane windows in the gable. The exterior is red brick. The front (north) façade also includes modern 1/1 windows, a wood frame segmental arch window, and a wood door. The foundation is poured concrete. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-49	Residence	278 Albert Street, Oshawa	Identified during field review	The property contains a two and one-half storey residence with a front gable roof. The exterior is red brick with matching brick voussoirs above the window and door openings. The windows and doors are modern. There is a full width covered front porch with plain square support pillars and plain railing. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular.	
BHR-50	Residence	284 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a front gable roof. There is modern siding in the gable. The exterior of the residence is brick. The windows and doors are modern. There is a half width porch on the front (east) façade with a corrugated metal roof and decorative metal support beams and railing. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-51	Residence	314 Albert Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There is a one storey addition on the front (east) façade that is clad in modern siding). The original residence has a red brick exterior with decorative brick banding across the bottom of the gable and a brick voussoir above the gable window. The windows and doors are modern. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-52	Bridge	N/A-Albert Street Bridge over CP Rail tracks, Oshawa	Class A Listed Property on Heritage Oshawa Inventory	The Albert Street Bridge over the CP Rail tracks is a wood and steel bridge. It contains sections of steel bracing and girders and sections of entirely wood construction. The bridge deck and railing are wood. The bridge was likely built *circa* 1912, when the CP Rail tracks were built through Oshawa. The bridge has potential design value as a rare surviving example of a wood and steel railway overpass. The distinctive wood deck and railing make the structure a landmark within the community. A CHER was completed for this bridge and determined the Albert Street Bridge is a hybrid bridge combining both the timber stringer bridge design and plate girder bridge design. The timber stringer sections of the bridge were likely built *circa* 1912 and the plate girder sections of the bridge were built *circa* 1957.	
BHR-53	Residence	480 Albert Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof and an enclosed front porch. The exterior of the residence is red brick with a matching brick voussoir above the segmental arch opening with a modern window in the gable. The enclosed porch on the front (east) façade has brick walls on the lower half with 4/1 wood frame windows on the upper half. There is a wooden door with four pane sidelight windows on either side. There is a shed roof dormer on the south façade. The foundation is poured concrete. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-54	Residence	482 Albert Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a two storey residence with a Dutch gable roof that is part of a duplex. The exterior is clad in modern siding and the residence has modern windows and doors. The foundation is poured concrete. According to the Heritage Oshawa Inventory, the residence was built in 1890. The residence has design value as a representative late 19th century Ontario vernacular structure.	
BHR-55	Residence	484 Albert Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a two storey residence with a Dutch gable roof that is part of a duplex. The exterior is clad in modern siding and the residence has modern windows and a wooden door. The foundation is poured concrete. According to the Heritage Oshawa Inventory, the residence was built in 1890. The residence has design value as a representative late 19th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-56	Residence	563 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a front gable roof. The exterior or the residence is red brick with matching brick voussoirs above the upper storey windows. The front (west) façade has an enclosed porch supported by square columns. The walls of the porch are clad in wood with decorative trim and there are 2/1 side lights on either side of a modern screen door. The sides of the porch have 3/2 windows. The foundation is poured concrete. The residence was likely built between 1900 and 1911 based on the architectural style and fire insurance plan. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-57	Residence	559 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a front gable roof. The exterior or the residence is red brick with matching brick voussoirs above the upper storey windows. The front (west) façade has a covered porch with decorative trim below its roof, spindle railing, and plain square support beams. The windows and door are modern. The foundation is poured concrete. The residence was likely built between 1900 and 1911 based on the style and fire insurance plan. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-58	Residence	551 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a front gable roof. The exterior or the residence is painted brick with brick voussoirs above the upper storey windows. The front (west) façade has a covered porch with railing and supported by plain square columns. The windows and door are modern. The foundation is poured concrete. The residence was likely built between 1900 and 1911 based on the style and fire insurance plan. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-59	Commercial	539 Albert Street, Oshawa	Identified during field review	The property contains a two storey commercial building with a flat roof. The exterior of the building is red brick with matching voussoirs above segmental arch window openings in the upper storey. The front (west) façade has two recessed entrances between large shop front windows on the ground storey. The foundation is poured concrete. The structure was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The structure has potential design value as a representative early to mid-20th century Ontario vernacular commercial structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-60	Residence	505 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a pyramidal roof that is part of a duplex. The exterior is painted brick. The residence has modern doors and windows. There is a full width covered front porch with modern wooden support beams. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-61	Residence	503 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a pyramidal roof that is part of a duplex. The exterior of the residence is brick and board and batten with the front (west) façade clad in board and batten siding and the north elevation clad in brick. The residence has modern doors and windows. There is a full width covered front porch with plain square support columns and a section of spindle railing. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-62	Residence	499 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a pyramid roof that is part of a duplex. The exterior of the residence is brick. There is a stained glass rectangular transom window above the first storey window. The residence has a wood door and modern windows on the second storey. There is a full width covered front porch with spindle support columns. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-63	Residence	497 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a pyramid roof that is part of a duplex. The exterior of the residence is painted brick with the first storey of the front (west) façade clad in modern siding. The windows and door are modern. There is a full width covered front porch with a combination of square and spindle support columns. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-64	Residence	495 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a pyramid roof that is part of a duplex. The exterior of the residence is brick. The residence has a modern door and windows. There is a full width covered porch with square support columns. The foundation is obscured. The residence was likely built between 1911 and 1903 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-65	Residence	493 Albert Street, Oshawa	Identified during field review	The property contains two storey residence with a pyramid roof that is part of a duplex. The exterior of the residence is painted brick. There are modern windows on the second storey. There is an enclosed porch on the first storey of the front (west) façade with a wood door, side lights, rectangular transom window, and 3/1 windows. The porch is clad with siding. The foundation is obscured. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-66	Residence	489 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a pyramidal roof that is part of a duplex. The exterior of the residence is brick. The residence has a modern door and windows. There is a full width covered front porch with plain square support beams. The foundation is obscured. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-67	Residence	487 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a hip roof that is part of a duplex. The exterior of the residence is painted brick. There are modern windows and doors. The residence has a full width covered front porch with plain square support beams. The foundation is obscured. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

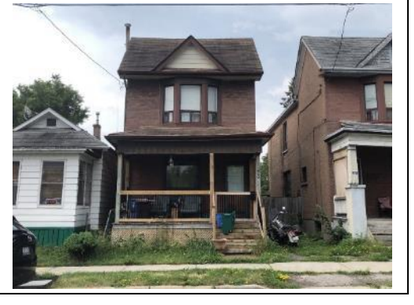
CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-68	Residence	477 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a hip roof that is part of a duplex. The exterior of the residence is painted brick. There is a stained glass transom above the first storey window and a full width covered porch with plain, square support beams and plain railing. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-69	Residence	469 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a hip roof that is part of a duplex. The exterior is red brick. There are modern windows in the upper storey and a modern door. The first floor window on the front (west) façade has a stained glass transom above it. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-70	Residence	467 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a hip roof that is part of a duplex. The exterior is red brick. There are modern windows in the upper storey and a modern door. The first floor window on the front (west) façade has a stained glass transom above it. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-71	Residence	435 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a hip roof that is part of a duplex. The exterior of the residence is painted brick. There are modern doors and windows. The full width covered porch has been removed on this structure and replaced with a retractable awning on this half of the duplex. The foundation is concrete block. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-72	Residence	433 Albert Street, Oshawa	Identified during field review	The property contains a two storey residence with a hip roof that is part of a duplex. The exterior is brick. The residence has modern doors and windows. The full width covered porch has been removed on this structure and replaced with a half width covered porch with plain square support beams and railing on this half of the duplex. The foundation is concrete block. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-73	Residence	431 Albert Street, Oshawa	Identified during field review	The property contains a one storey residence. It has a centre gable roof and a one storey hip roof addition on the north façade. The addition is clad in wood and has a concrete block foundation. The exterior of the original residence is brick with brick quoins. There is a triangular pediment above the entrance. The residence has 2/2 wood frame windows. The foundation is obscured. The residence was likely built between 1878 and 1911 based on the architectural style, historical mapping, and the fire insurance plan. The residence has potential design value as a representative Ontario vernacular structure with Gothic Revival design influence.	
BHR-74	Residence	371 Albert Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red/brown brick with matching brick voussoirs above the window openings. The doors and windows are modern. The residence has a half width covered porch with a metal roof and partial brick support pillars completed by decorative metal support posts. The porch also has decorative metal railing. The foundation is poured concrete with faux stone panels covering most of the foundation. The residence was likely built between 1911 and 1931 based on fire insurance mapping and city directories. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-75	Residence	367 Albert Street, Oshawa	Identified during field review	The property contains a one storey residence with a front gable roof. There is bargeboard, half timbering, and pebble dash in the gable. The exterior of the residence is red brick. The front (west) façade has a bay window, a segmental arch door opening, and a wood frame octagonal window. There are stone accents around the door and under the bay window. The door has a triangular pediment with bargeboard and the bay window has a triangular pediment with bargeboard, half timbering and pebble dash. The foundation is poured concrete. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative mid-20th century vernacular structure with Period Revival design influences.	

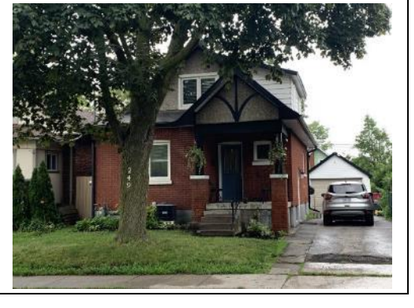
CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-76	Residence	355 Albert Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a combination hip and front gable roof. There is bargeboard and stucco in the gable. There is a shed roof dormer on the south façade and a gable roof dormer on the north façade. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings on the first storey. The residence has wood frame storm windows and 3/1 windows on the first storey and modern storm windows over 3/1 windows in the gable. The entrance on the front (west) façade has a covered porch with decorative railing and a gable roof supported by brick half pillars and square columns. The porch gable has bargeboard, half timbering, and stucco inside it. The foundation is concrete blocks. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a mid-20th century vernacular structure with Period Revival design influence.	
BHR-77	Residence	351 Albert Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a combination hip and front gable roof. There is siding in the gable, a shed roof dormer on the south façade and a gable dormer on the north façade. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings on the first storey. The residence has modern doors and windows, except for a small 3/1 wood frame window under the porch. The entrance on the front (west) façade has a covered porch with plain railing and a gable roof supported by brick half pillars and square columns. The porch gable has bargeboard, half timbering, and pebble dash inside it. The foundation is poured concrete. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative mid-20th century vernacular structure with Period Revival design influence.	
BHR-78	Residence	323 Albert Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a two storey residence with a side gable roof and gable peak. The exterior of the residence and the gable have been clad in siding. The windows and doors are modern. There are bay windows on the north and front (west) facades. The residence has a full width covered front porch with the roof supported by half pillars made of concrete and square columns. The foundation is poured concrete. According to the Heritage Oshawa Inventory, the residence was constructed in 1900. The residence has design value as a representative early 20th century Ontario vernacular structure.	
BHR-79	Residence	263 Albert Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above segmental arch windows openings. The residence has modern windows and doors. There is a full width covered front porch on the front (west) façade with plain railing and turned support columns. There is a short row of spindles below the porch roof as well. The residence has a stone foundation. The residence was likely built between 1900 and 1911 based on the style and the fire insurance plan. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-80	Residence	256 Court Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is brick with brick voussoirs above the window openings. The windows and doors are modern. There is a half width covered porch on the front (east) façade with turned supports, plain railing, and a rusticated concrete block base. The foundation is poured concrete. According to the Heritage Oshawa Inventory, the residence was constructed in 1905. The residence has design value as an early 20th century representative Ontario vernacular structure.	
BHR-81	Church	300 Court Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a two storey church with a front gable roof. The exterior of the structure is red brick and modern siding. There is an enclosed entrance vestibule with a steeply pitched gable roof on the front (east) façade. The entryway has a segmental arch shaped door on the east side at the ground level and a pointed arch double door that enters the second storey on the north side of the entryway. The second storey on the front façade also has pointed arch windows. The central window, located in the entryway, is stained glass and the windows to each side of it have stained glass panes in the top section. There is a small octagonal bell tower on top of the main gable. The foundation is poured concrete. According to the Heritage Oshawa Inventory, the church was constructed in 1925. The church has potential design value as a representative early 20th century church with Neo-Gothic influence and associative or historical value through its connection to the Church of the Good Shepherd and the community.	
BHR-82	Residence	113 Stacey Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There are shingles in the gable. The exterior of the residence is red brick with matching brick voussoirs above the segmental arch window openings. The residence has wood frame, 4 pane storm windows in front of 3/1 wood frame windows. The window in the gable is wood frame as well. There is a half width covered porch on the front (north) façade with brick half pillars and square columns. The porch has spindle railing. The foundation is rusticated concrete. The residence was likely built between 1921 and 1931 based on city directories. The residence has potential design value as a representative early 20th century Ontario vernacular structure with Arts and Crafts influence.	
BHR-83	Residence	117 Stacey Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is brick with brick voussoirs above the windows. The windows and doors are modern. There is a full width covered porch with plain support beams and railings. The foundation is poured concrete. The residence was likely built between 1900 and 1911 based on the style and the fire insurance plan. The residence has potential design value as an early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-84	Residence	121 Stacey Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is brick with brick voussoirs above the windows. The windows and doors are modern. There is a full width covered porch with plain support beams and railings. The foundation is poured concrete. The residence was likely built between 1900 and 1911 based on the style and the fire insurance plan. The residence has potential design value as an early 20th century Ontario vernacular structure.	
BHR-85	Residence	125 Stacey Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is painted brick with brick voussoirs above the windows and door. The windows are modern. There is a stained-glass window in the door and a rectangular stained glass transom window above the first storey window on the front (north) façade. There is a full width covered porch with turned support beams and plain railings on the front façade. The foundation is poured concrete. The residence was likely built between 1900 and 1911 based on the style and the fire insurance plan. The residence has potential design value as an early 20th century Ontario vernacular structure.	
BHR-86	Residence	129 Stacey Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof and brick chimney. The exterior of the residence is red brick with brick voussoirs above the windows. The window and in the gable and the door are modern. There is a rectangular stained glass transom window above the first storey window on the front (north) façade. This window has wood frame storm windows covering a three paned window. There is a half width covered porch with pain, square support beams and railings on the front façade. The residence has a stone foundation. The residence was likely built between 1900 and 1911 based on the style and the fire insurance plan. The residence has potential design value as an early 20th century Ontario vernacular structure.	
BHR-87	Residence	95 Wilkinson Avenue, Oshawa	Identified during field review	The property contains a two storey residence with a hip roof. The exterior of the residence is rusticated concrete block. The windows and door are modern. There is a wooden half width covered porch with an upper balcony added to the front (north) façade. The foundation is poured concrete. The residence was likely built between 1911 and 1928 based on fire insurance mapping and city directories. The residence has potential design value as a representative early to early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-88	Residence	67 Banting Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a side gable roof. The exterior of the residence is red brick. The windows and doors are modern. There is a bay window on the upper storey of the front (north) façade. The front façade also has a full width, covered porch with plain square support beams and turned spindle railing. The foundation is poured concrete. The residence was likely built between 1912 and 1921 based on fire insurance mapping and city directories. The residence has potential design value as a representative early 20th century Ontario vernacular residence.	
BHR-89	Residence	69 Banting Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a centre gable roof. The gable has siding inside it. The exterior of the residence is brick. The windows and doors are modern. There is a bay window on the upper storey of the front (north) façade. The front façade also has a half width, covered porch with a metal roof and plain wood support beams and railing. The foundation is concrete with a stamped block design. The residence was likely built between 1912 and 1921 based on fire insurance mapping and city directories. The residence has potential design value as a representative early 20th century Ontario vernacular residence.	
BHR-90	Residence	71 Banting Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a centre gable roof. The gable has wood shingles and timbering inside it. The exterior of the residence is brick. The windows are wood frame ½ windows and the door is modern. There is a bay window on the upper storey of the front (north) façade. The front façade also has a full width, covered porch with half pillars made of concrete and square support columns. The foundation is concrete with a stamped block design. The residence was likely built between 1912 and 1921 based on fire insurance mapping and city directories. The residence has potential design value as a representative early 20th century Ontario vernacular residence.	
BHR-91	Residence	73 Banting Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a centre gable roof. The gable has siding inside it. The exterior of the residence is brick. The windows are wood frame 1:2 windows and a wooden door with a nine-pane window. There is a bay window on the upper storey of the front (north) façade. The front façade also has a full width, covered porch with square support beams and plain railing. The foundation is concrete. The residence was likely built between 1912 and 1921 based on fire insurance mapping and city directories. The residence has potential design value as a representative early 20th century Ontario vernacular residence.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-92	Residence	83 Banting Avenue, Oshawa	Identified during field review	The property contains a one storey residence with a Dutch gable roof that has board and batten siding in the gable. The exterior of the residence is brick. The window and doors, which are modern, are in segmental arch openings. The windows on the east façade have brick voussoirs. There is a full width covered porch with turned spindle supports and wooden railing. The foundation is poured concrete. The residence was likely built between 1912 and 1931 based on city directories. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-93	Residence	92 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There is siding in the gable. The exterior of the residence is red brick. The windows and doors are modern. The residence has an enclosed porch on the front (south) façade. The porch has a corrugated metal roof and the walls are clad in siding. The foundation is poured concrete. The residence was likely built between 1911 and 1930 based on the fire insurance plan and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular residence.	
CHL-1	Residential CHL	106 to 136; 142 to 168; 145 to 167.5 Olive Avenue, Oshawa	Class A Listed Property on the Municipal Heritage Register	These properties contain two storey row houses with flat rooflines. The exterior of the residences is brick with brick voussoirs above the window and door openings. The residences have a mixture of replacement and original windows and doors. The houses have full width front porches. Located on both sides of Olive Avenue and a rare example of row housing in downtown Oshawa, the structures give this section of Olive Avenue a distinct character. According to the Heritage Oshawa Inventory, the rowhouses were built *circa* 1910. The row houses contain potential design value as early 20th century Ontario vernacular structures and are contextually linked to their surroundings and are landmark structures along Olive Avenue.	
BHR-94	Residence	140 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There is an enclosed, nearly full width porch on the front (south) façade. The exterior of the residence is red brick with board and batten siding in the gable and on the walls of the porch. The gable also has bargeboard. The windows and doors are modern. The foundation is concrete blocks. The residence was likely built between 1931 and 1951 based on city directories. The residence has potential design value as a representative mid-20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-95	Residence	176 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a Dutch gable roof. The exterior of the residence is brick. The windows and doors are modern. There is a full width, covered porch on the front (south) façade with plain square support columns and railing. There are dentils along the roofline of the porch. The foundation is obscured. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-96	Residence	220 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with shingles in the gable and matching brick voussoirs above the window and door openings. The windows are modern and there is a wooden door. The residence has a full width, covered porch on the front (south) façade. The porch roof is supported by brick half pillars with square columns on top. The foundation is concrete block. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-97	Residence	253 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick and there is siding and a 3/1 wood frame window in the gable. The rest of the windows are modern with wood surrounds. The residence has a full width, covered porch on the front (north) façade that is partially enclosed. The porch roof is supported by brick half pillars with round columns on top. The foundation is poured concrete. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-98	Residence	249 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a combination hip and gable roof. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings. There is a shed roof dormer on the side (west) façade. There is a half width covered front porch with a gable roof supported by brick half pillars with plain square columns on top. The gable of the porch is filled with pebble dash and half timbering and the gable of the house is also filled with pebble dash. The windows and door are modern. The foundation is concrete block. The residence was likely built between 1931 and 1951 based on city directories. The residence has potential design value as a representative mid-20th century Ontario vernacular structure with Arts and Crafts design influence.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-99	Residence	245 Olive Avenue, Oshawa	Identified during field review	The property contains a one storey residence with a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings. The gable is filled with pebble dash and has half timbering and bargeboard. The front (north) façade has a bay window and a wooden door. The small window in the front façade has a diamond design in the pane. The foundation is poured concrete. The residence was likely built between 1931 and 1951 based on city directories. The residence has potential design value as representative mid-20th century Ontario vernacular structure with Arts and Crafts design influence.	
BHR-100	Residence	229 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof and shed roof dormers on the east and west facades. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window openings. The residence has modern windows. There is a full width, covered porch on the front (north) façade. The porch roof is supported by brick half pillars with plain square columns on top. The foundation is concrete block. The residence was likely built between 1931 and 1951 based on city directories. The residence has potential design value as a representative mid-20th century Ontario vernacular structure.	
BHR-101	Residence	225 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There are shed roof dormers on the east and west facades. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings. There are contrasting bricks at the corners of the front (north) façade. There is a wooden door and replacement 3/1 windows on the first storey. The residence has a full width porch on the front façade. The porch roof is supported by brick half pillars with plain square columns on top. The foundation is concrete block. The residence was likely built between 1931 and 1951 based on city directories. The residence has potential design value as a representative mid- 20th century Ontario vernacular structure.	
BHR-102	Civic	219 Olive Avenue, Oshawa	Identified during field review	The property contains a one storey civic building with a flat roof. The exterior of the building is red brick with a decorative brickwork band near the roof line. There are stone accents on the corners of the buildings and around the door and window openings. There are wooden, modern windows and one glass block window above the door. The foundation is poured concrete. The structure was likely built between 1900 and 1930 based on the style and topographic mapping. The building has potential design value as a representative early 20th century Ontario vernacular civic structure. The property is historically associated with "*GR.21 Zwiqzek Polakow w Kanadzie",* a Polish organization established in Oshawa in 1922 and is significant to the Polish community of Oshawa.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-103	Residence	217 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a combination hip and gable roof. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings. There are shed roof dormers on the east and west façades. There is a half width covered front porch with a gable roof supported by brick half pillars with plain square columns on top. The gable of the porch is filled with pebble dash and half timbering and the gable of the house is also filled with pebble dash. The windows and door are modern, with the exception of a small window under the porch on the front (north) façade that has a wood frame storm window. The foundation is concrete block. The residence was likely built between 1931 and 1951 based on city directories. The residence has potential design value as a representative mid-20th century Ontario vernacular structure with Arts and Crafts design influences.	
BHR-104	Residence	213 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings. There are shed roof dormers on the east and west façades. There is a full width covered front porch with the roof supported by brick half pillars with plain square columns on top. The windows and door are modern. The foundation is poured concrete. The residence was likely built between 1931 and 1951 based on city directories. The residence has potential design value as a representative mid-20th century Ontario vernacular structure.	
BHR-105	Commercial	183 Olive Avenue, Oshawa	Identified during field review	The property contains a two storey commercial structure with a flat roof. The exterior of the building is red brick with matching brick voussoirs above segmental arch window openings on the second story. The ground storey has large shop front windows with a wooden door and the upper storey windows are modern. The foundation appears to be brick with parging. The building was likely built between 1900 and 1930. The building has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-106	Residence	181 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a clipped gable roof. There are shingles in the gable. There is a shed roof dormer on the east façade. The exterior of the residence is red brick. There is a full width, covered porch on the front (north) façade with the roof supported by brick half pillars with square columns on top. There is a row of dentils along the porch roofline. There is a wooden door with modern windows. The foundation is obscured. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-107	Residence	139 Olive Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There are shingles in the gable and a gable roof dormer on west façade. The exterior of the residence is red brick with matching brick voussoirs above the window and door openings. The residence has a wooden door with a four-pane window and modern windows. The foundation is poured concrete. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-108	Residence	101 Olive Avenue, Oshawa	Identified during field review	The property contains a two storey residence with a hip roof. The exterior of the residence is clad with stucco. The windows and door are modern. There is a bay window on the front (north) façade and the entrance is recessed in an arched access. The foundation is poured concrete. The residence was likely built between 1900 and 1930 based on the style, city directories, and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-109	Residence	97 Olive Avenue, Oshawa	Identified during field review	The property contains a two storey residence with a hip roof. The exterior of the residence is clad with stucco. The windows and door are modern. There is a segmental arch window on the front (north) façade and the entrance is recessed in an arched access. The foundation is poured concrete. The residence was likely built between 1900 and 1930 based on the style, city directories, and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-110	Residence	66 First Avenue, Oshawa	Identified during field review	The property contains a two storey residence with a pyramidal roof and is part of a duplex. The exterior of the residence is painted brick with brick voussoirs over the second storey windows. The residence has a modern door. There is a rectangular stained-glass transom above first storey window. There is a full width, covered porch on the front (south) façade with spindle support beams, decorative lattice corner pieces and spindle railing. The foundation is obscured. The residence was likely built between 1900 and 1911 based on the style and fire insurance plan. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

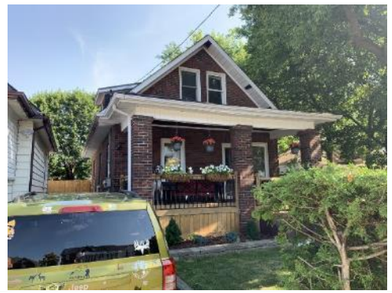
CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-111	Residence	68 First Avenue, Oshawa	Identified during field review	The property contains a two storey residence with a pyramidal roof and is part of a duplex. The exterior of the residence is brick with brick voussoirs over the second storey windows. The residence has a wooden door with the contains a nine-pane window. There is a rectangular stained-glass transom above the first storey window. There is a full width, covered porch on the front (south) façade with plain square support columns and a section of railing. The foundation is obscured. The residence was likely built between 1900 and 1911 based on the style and fire insurance plan. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-112	Residence	65 First Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a hip roof that is part of a duplex. The exterior of the residence is red brick. There is a stained-glass transom window on the first storey. The door is obscured by a large evergreen tree. The residence also has a full width, covered porch on the front (north) façade with the roof supported by plain square columns. The foundation is concrete. The residence was likely built between 1900 and 1911 based on the style and fire insurance plan. The residence has potential design value as a representative early-20th century Ontario vernacular structure.	
BHR-113	Residence	66 Second Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a hip roof that is part of a duplex. The exterior of the residence is brick. The second storey has a modern window, with a four-pane wood frame window on the first storey. The residence has a full width, covered porch on the front (south) façade with the roof supported by plain square beams. The foundation is concrete. The residence was likely built between 1900 and 1911 based on the style and fire insurance plan. The residence has potential design value as a representative early-20th century Ontario vernacular structure.	
BHR-114	Residence	548 Front Street, Oshawa	Identified during field review	This property contains a residence. The residence is a one and one-half storey structure with a front facing gable roof and a brick chimney. The exterior is red brick and contains modern windows and a modern door. The residence has a full-width front porch and a poured concrete foundation. The residence was likely built between 1900 and 1911 based on the style and fire insurance plan. The residence has potential design value as a representative early-20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-115	Industrial	500 Howard Street, Oshawa	Class A Listed Property on the Municipal Heritage Register, Provincial Heritage Property of Provincial Significance	The property contains a historic factory with multiple additions surrounded by a large parking area. The historic portion of the building has two stories with a flat roofline. The exterior of the building is red brick with contrasting buff brick details. The buff brick details include voussoirs above the segmental arch windows openings, banding, and decorative brickwork below the roofline. The windows have been boarded up. The foundation is poured concrete. According to the Statement of CHVI contained in Appendix B of the CHR, the building is divided into Part 1 and Part 2., Part 1 was built *circa* 1897 and expanded with an addition before 1910 by the Ontario Malleable Iron Company. The property is a Provincial Heritage Property of Provincial Significance and according to the prepared statement of CHVI the property contains design value through its intact brick architecture, its historic association with the Ontario Malleable Iron Co., and its contextual relationship with the surrounding railway and industrial area. These heritage attributes do not apply to Part 2 of the building, which is identified in the statement of CHVI as being adaptively reused by the Knob Hill Farms grocery store in 1981 (Metrolinx 2016; ERA 2022).	
BHR-116	Residence	491 Howard Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There are shingles in the front gable and a gable dormer on the south façade. The exterior of the residence is red brick. The windows and doors are modern. The residence has a full width, covered porch on the front (west) façade with the roof supported by brick half pillars with square columns on top. The foundation is poured concrete. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative mid-20th century Ontario vernacular residence.	
BHR-117	Residence	497 Howard Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above the window openings. The residence has modern windows and the door is obscured by a large evergreen bush. There is a metal roof over the door supported by decorative metal beams. The foundation is concrete blocks. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative mid-20th century Ontario vernacular residence.	
BHR-118	Residence	353 Drew Street, Oshawa	Identified during field review	The property contains a two storey residence with a front gable roof. There is siding in the gable. The exterior of the residence is red brick with matching brick voussoirs above the window and door openings. The residence has a modern door and windows and partial width porch. The foundation is rusticated concrete block. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative mid-20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-119	Residence	481 Drew Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a crossed clip gable roof. The exterior of the residence is buff brick with matching brick voussoirs above segmental arch window openings. The front (west) entrance is a wooden door with a six pane window and three pane side lights on either side of the door. There is a full width, covered porch supported by brick half pillars with decorative metal columns on top. The foundation is poured concrete. The residence was likely built between 1900 and 1931 based on architectural style and city directories. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-120	Residence	489 Drew Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a clipped gable roof. There is a clipped gable dormer on the south façade. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings. The windows are 3/1 pane and there is a wooden door. The residence has a full width, covered porch on the front (west) façade and the roof is supported by brick half pillars with plain square columns on top. The foundation is poured concrete. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early to mid-20th century Ontario vernacular structure.	
BHR-121	Residence	497 Drew Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with a band of buff brick between the ground and upper stories. There are brick voussoirs above segmental arch window and door openings. The windows and door are modern. The foundation is concrete block. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early to mid-20th century Ontario vernacular structure.	
BHR-122	Residence	500 Drew Street, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick. There are brick voussoirs above segmental arch window and door openings. The windows and door are modern. The foundation is concrete block. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative mid-20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-123	Residence	362 Drew Street, Oshawa	Identified during field review	The property contains a one storey residence with a front gable roof. The exterior of the residence is red brick. The windows are modern and there is a wooden door with three large windowpanes. There is a full width, covered porch on the front (east) façade. The porch roof is supported by brick half pillars with plain square columns on top. The foundation is poured concrete. The residence was likely built between 1900 and 1932 based on architectural style and city directories. The residence has potential design value as a representative mid-20th century Ontario vernacular structure.	
BHR-124	Residence	242 Mitchell Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There is pebble dash in the front gable and a shed roof dormer on the east façade. The exterior of the residence is red brick with brick voussoirs above segmental arch window and door openings. There is a bay window with a wood surround on the front (south) façade and a small 3/1 wood frame window. The foundation is poured concrete. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early to mid-20th century Ontario vernacular structure.	
BHR-125	Residence	248 Mitchell Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There is siding in the front gable and a shed roof dormer on the east façade. The exterior of the residence is red brick with brick voussoirs above segmental arch window and door openings. There is a bay window on the front (south) façade and the residence has modern windows and shutters in the upper storey. The foundation is poured concrete. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early to mid-20th century Ontario vernacular structure.	
BHR-126	Residence	391 Mitchell Avenue, Oshawa	Identified during field review	This property contains a residence. The residence is a one and one-half storey structure with a steeply pitched front facing gable roof clad in metal. The exterior of the residence is red brick and contains bargeboard just below the gable peak of the front (north) façade. The residence has modern windows and doors and a full-width front porch. The foundation is poured concrete. The residence was likely built between 1900 and 1930 based on architectural style and topographic mapping. The residence has potential design value as a representative Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-127	Residence	249 Mitchell Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There are shingles in the gable. The exterior of the residence is red brick with matching brick voussoirs. There are modern windows and doors. The residence has a full width, covered porch on the front (north) façade and the roof is supported by brick half pillars with plain square columns on top. The foundation is poured concrete. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-128	Residence	225 Mitchell Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a clipped gable roof. There are shed roof dormers on the east and west facades. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window openings. There is a modern door and modern windows. There is a full width, covered porch on the front (north) façade and the roof is supported by brick half pillars with plain white columns on top. The foundation is poured concrete. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-129	Residence	242 Graburn Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings. The windows and doors are modern. There is a full width, covered porch on the front (south) façade and the roof is supported by brick half pillars with wooden beam on top. The foundation is poured concrete. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-130	Residence	255 Graburn Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with matching voussoirs above segmental arch window and door openings. The windows have wood frames. There is a triangular pediment above one of the windows and the door on the front (north) façade. Both the gable and the pediment have shingles inside them. The foundation is poured concrete. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative mid-20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-131	Residence	241 Graburn Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There are shingles in the front gable and a shed roof dormer on the east façade. The exterior of the residence is red brick with matching red brick voussoirs above segmental arch window and door openings. The windows and door are modern. There is a full width, covered porch on the front (north) façade and the porch roof is supported by brick half pillars with square columns on top. The foundation is concrete block. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative mid-20th century Ontario vernacular structure.	
BHR-132	Residence	235 Graburn Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There are shingles is a shed roof dormer on the east façade. The exterior of the residence is red brick with matching red brick voussoirs above the window and door openings. The windows and door are modern. There is a full width, covered porch on the front (north) façade and the porch roof is supported by brick pillars. The foundation is poured concrete. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative mid-20th century Ontario vernacular structure.	
BHR-133	Residence	217 Graburn Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There is siding in the gable and a shed roof dormer on the west façade. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window openings. The windows are 3/1 wood frame windows. A partial enclosure has been added around the front (north) entrance which is clad in siding. The foundation is concrete block. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-134	Residence	224 Beatty Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with brick bands along the top of the ground and upper stories and brick voussoirs above segmental arch window and door openings. The windowsills are also brick. The windows and door are modern. There is a triangular pediment above the door on the front (south) façade. The foundation is concrete block. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early to mid-20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-135	Residence	228 Beatty Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a clipped gable roof. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window openings. There is a bay window on the ground storey of the front (south) façade. The windows are modern. There is a half width, covered porch and the roof is supported by brick half pillars and square support columns. The door is obscured by a large evergreen tree. The foundation is concrete block. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early to mid-20th century Ontario vernacular structure.	
BHR-136	Residence	232 Beatty Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior is red brick with matching brick voussoirs above segmental arch window and door openings. The residence contains a combination of modern windows and 3/1 wood frame windows with shutters. There is a full width, covered porch on the front (south) façade and the roof is supported by brick half pillars with round columns on top. The foundation is concrete block. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-137	Residence	243 Beatty Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There is siding in the gable. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings. The windows and doors are modern. There is a small porch and roof above the door on the front (north) façade supported by plain square columns. The foundation is poured concrete. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early to mid-20th century Ontario vernacular structure.	
BHR-138	Residence	235 Beatty Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above segmental arch window and door openings. There is a wood door and 3/2 windows. The residence has a full width, covered porch on the front (north) façade and the roof is supported by plain square beams. The foundation is poured concrete. The foundation is poured concrete. The residence was likely built between 1939 and 1954 based on topographic mapping, city directories, and aerial photography. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-139	Residence	225 Beatty Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with matching brick voussoirs above the window and door openings. The residence has modern windows with awnings, with the exception of a small, wood frame 3:1 window on ground storey of the front (north) façade. There is a half width porch with a gable roof over the front entrance. There is siding in the gable and the roof is supported by brick half pillars with plain square beams on top. The porch has a concrete block foundation and the house has a poured concrete foundation. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early to mid-20th century Ontario vernacular structure.	
BHR-140	Residence	221 Beatty Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There is bargeboard in the gable. The exterior of the residence is covered with stucco. The residence has a combination of modern, sympathetic windows and wood frame windows. There is a full width, enclosed porch on the front (north) façade. The porch has 3/1 windows. The foundation is concrete block. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure with Queen Anne design influence.	
BHR-141	Residence	223 McNaughton Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a cross gable roof. The front (north) facing gable has siding in it. The exterior of the residence is red brick with stone accents at the corner, around the windows, and around the door. The windows and door are modern but sympathetic. The foundation is concrete block. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early to mid-20th century Ontario vernacular residence with Period Revival design influence.	
BHR-142	Residence	220 Etna Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a side gable roof. There are two gable dormers clad in siding on the front (south) façade. The exterior of the residence is red brick with stone accents around the door and windows. The picture window is covered by an awning. The foundation is concrete block. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The property has potential design value as a mid-20th century Ontario vernacular structure with Colonial Revival design influence.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-143	Residence	223 Etna Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a cross gable roof. The exterior of the residence is red brick with a brick voussoir above the upper storey window and stone accents and keystones around the ground storey windows. The windows and door are modern. The foundation is poured concrete. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a mid-20th century Ontario vernacular structure with Period Revival design influence.	
BHR-144	Residence	230 Etna Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. There is a second, offset, protruding gable above a window on the ground storey of the front (south) façade. Both gables have siding in them. The exterior of the residence is red brick with stone accents and key stones around the ground storey window and door opening on the front façade. The windows and door are modern, with the exception of the wood frame window in the gable. There is a half width porch covered by a metal roof with decorative metal support beams and railings. The foundation is concrete block. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early to mid-20th century Ontario vernacular residence with Arts and Crafts design influence.	
BHR-145	Motel	214 Toronto Avenue, Oshawa	Identified during field review	The property contains a one and one-half storey heavily modified residence with a one storey u-shaped motel addition. The residence has a front gable roof, and the exterior is clad in stucco. The residence has modern windows and doors and there is no visible foundation. The hotel rooms also have a gable roof and are clad in stucco. The rooms have modern doors and windows as well. The residence was likely built between 1900 and 1930 based on the style and topographic mapping. The motel was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The motel is functionally and historically linked with Highway 401, located just south of the motel. Lodgings oriented around car travel became popular in the postwar period as society emphasized the use of the car as a travel and leisure method.	
BHR-146	School	300 Ritson Road South, Oshawa	Class B Listed Property on the Municipal Heritage Register	The property contains a three storey school building with a flat roof line. The exterior of the building is red brick with decorative brickwork around a large, pointed arch at the main entrance on the building's east façade. The entrance contains a large, wooden double door with sidelights and a multipaned window filling the top section of the arch. The windows are modern. The building's foundation is not clearly visible from the public right of way. According to the Heritage Oshawa inventory, the school was built in 1928 and closed in 2012 by the Durham School Board. The building has design value as a representative Neo-Gothic structure. The building has potential design or associative value from its role in the community as an educational facility.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-147	Residence	356 Ritson Road South, Oshawa	Class A Listed Property on the Municipal Heritage Register	The property contains a two-storey residence with a side gable roof and large end-wall chimneys. The exterior of the residence is red brick. There are painted drip mould voussoirs above symmetrically spaced segmental arch window openings. The windows are modern and flanked by shutters. The main entrance on the front (east) façade has two doors with fan lights in a decorative wooden surround. The entrance has a small porch with a roof supported by plain square beams with decorative wooden brackets. The foundation has been parged with concrete, obscuring the original foundation. According to the Heritage Oshawa Inventory, the residence was built *circa* 1880. The residence has potential design value as a late 19th century Ontario vernacular structure with Italianate influences. A CHER was completed for the property determined the residence was likely built between 1862 and 1880. The residence at 356 Ritson Road South is an example of an Ontario vernacular structure that retains the balance and overall symmetry of a Georgian style structure and includes limited Italianate elements.	
BHR-148	Church	464 Ritson Road South, Oshawa	Identified during field review	The property contains a one and one-half storey church building. The roof has a front gable with a square tower topped with a dome in the centre of the front (east) façade. The exterior of the building is red brick with stone accents in cross shaped in the front façade and in an arch around the door. The entrance has modern metal double doors with a semi-circular painting filling the top portion of the arch. The windows are stained-glass and have arched openings. The foundation is concrete. The church was blessed on October 2, 1955 (Eparchy of Ss. Cyril and Methodius of Slovaks of the Byzantine Rite in Canada n.d.). The building has potential design value as a mid-20th century church with Ukrainian design influences. The building also has potential historic and associative value through its connection to the Mother of God Parish and community. A CHER was completed for this property and determined the church was built in 1956 and is a vernacular structure with influences from eastern Christianity.	
BHR-149	Church	470 Ritson Road South, Oshawa	Identified during field review	The property contains a one and one-half storey church building. The building has a front gable roof with a spire near the front (east) façade. The exterior of the building is red brick with matching brick voussoirs above the windows on the side facades. The front façade has been clad in faux stone with vertical bands of stucco. The doors and windows are modern. The foundation is concrete. The church was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The building has potential design value as a representative mid-20th century Ontario vernacular structure. The church has potential associative value as “The Corner Church”, an institution part of the community of Oshawa. A CHER was completed for this property and determined the structure at 470 Ritson Road South was built as The Slovak National Hall in 1939. The structure was modified to its present appearance in the late 20th century or early 21st century.	
BHR-150	Residence	359 Ritson Road South, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a side gable roof. There is a large gable roof dormer on the front (west) façade w with a shed roof dormer on the rear façade. There is siding in the front dormer. The exterior of the residence is red brick. There is a wooden door and 6/1 wood frame windows on the ground floor. The residence’s roof provides an overhang for a front porch and is supported by brick half pillars with square columns on top and low brick walks between them. The foundation is poured concrete. The residence was likely built between 1900 and 1931 based on architectural style and city directories. The residence has potential design value as a representative early to mid-20th century Ontario vernacular residence with Craftsman influence. A CHER was completed for this property and determined the residence was likely built *circa* 1920 and is an example of Craftsman style architecture.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-151	Residence	349 Ritson Road South, Oshawa	Identified during field review	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is red brick with brick voussoirs above the window and door openings. The window and door openings on the ground storey of the front (west) façade are segmental arches. The windows and door are modern. There is a full width, covered porch on the front façade. The porch has a gable roof filled with siding and supported by brick pillars. The foundation is poured concrete. The residence was likely built between 1932 and 1950 based on city directories and architectural style. The residence has potential design value as a representative early to mid-20th century Ontario vernacular structure. A CHER was completed for this property and determined the residence was likely built between 1938 and 1941. The residence at 349 Ritson Road South is an example of an Ontario vernacular structure and is consistent with designs common in the early 20th century.	
BHR-152	Residence	392 Oshawa Boulevard South	Identified during field review	This property contains a residence. The residence is a one and one-half storey structure with a steeply pitched front facing gable roof with gable dormers on the west and east elevations. The exterior of the residence is clad in modern siding and red brick. The upper storey has modern windows and the first storey has modern windows in segmental arch window openings. The residence contains a full-width porch with wood columns and a modern door. The foundation is poured concrete. The residence was likely built between 1900 and 1930 based on architectural style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-153	Residence	429 Crerar Avenue, Oshawa	Identified during field review	This property contains a residence. The residence is a one and one-half storey structure with a steeply pitched front facing gable roof with a brick chimney and gable dormers on the east and west elevations. The residence is clad in red brick and the main (north) elevation contains rusticated concrete window and door surrounds on the first storey. The residence has a modern door and rusticated concrete block foundation. The residence was likely built between 1900 and 1930 based on architectural style and topographic mapping. The residence has potential design value as a representative early 20th century Ontario vernacular structure.	
BHR-154	Residence	393 Wilson Road South, Oshawa	Identified during field review	This property contains a one and one-half storey residence with a side gable roof and a gable dormer on the front (west) elevation. The gables are clad in modern siding. The exterior of the residence is clad in red brick with matching brick voussoirs above the window openings. The residence has modern windows and doors and a full-width front porch. The foundation is poured concrete. The residence features Craftsman design elements including decorative brickwork on the porch surround and stone steps leading to the front entrance. Following a review of aerial photography, architectural style, and topographic mapping the date of construction of this residence cannot be determined. The architectural style is consistent with early 20th century Craftsman style architecture. However, aerial photography shows a vacant lot in 1954 and topographic mapping from 1968 indicates the presence of a building. The residence has potential design value as a representative example of an early to mid-20th century Ontario vernacular structure with Craftsman design influence.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-155	Church	374 Farewell Street, Oshawa	Identified during field review	The property contains a one storey church building with a cross gable roof. The gables are clad in modern siding. The exterior is clad in red brick. The windows and doors are modern. The door on the front (east) façade has a large, three pane transom window above it. The front gable is supported by square columns and has a row of dentils above the columns. The building was likely built between 1954 and 1968 based on aerial photography and topographic mapping. The building has potential design value as a representative mid-20th century representative example of church design. The church has potential associative value as the Evangel Church. A CHER was completed for the property and determined that in 1966 the Evangel Pentecostal Church built a place of worship on Farewell Street which was converted into a daycare centre in 1979 when the present-day church was built. The church is an example of a modernist structure with a Colonial Revival port-cochere.	
BHR-156	Bridge	N/A—Farewell Street Multi-Use Bridge over CPR tracks	Identified during field review	The Farewell Street Multi-Use Bridge is a timber bridge which crosses the CPR tracks. The bridge contains timber bracing and piers which support a timber deck. The original railing has been replaced by chain-link fencing. The bridge was likely built in about 1912. The bridge is a rare example of a timber structure and its distinctive appearance and timber decking make it a landmark structure in an otherwise postwar suburban neighbourhood. A CHER was completed for the bridge and determined the Farewell Street Multi-Use Bridge is a wood stringer bridge that was built *circa* 1912 when the CP Rail was constructed through the present-day City of Oshawa. The bridge is a rare surviving example of a timber bridge within the City of Oshawa and Regional Municipality of Durham.	
BHR-157	Cemetery	N/A – St. Wolodymyr and St. Olha Ukrainian Cemetery, Clarington	Identified by Municipality of Clarington as a potential cultural heritage resource	The property contains a cemetery. The cemetery has a row of mature trees on the east and south edges of the property. The main entrance is located on the eastern side. It has a metal gate with an arch bearing the name of the cemetery in English and Cyrillic atop stone pillars. There is also a curved section of stone wall on either side of the gate. The tombstones were obscured by distance from the right of way. The cemetery was associated with St. George the Great Martyr Ukrainian Catholic Church and according to the parish website, the cemetery was in operation from 1969 to 2019 (St. George the Great Martyr Ukrainian Catholic Church n.d.). The cemetery has historical or associative value from its connection to the St. George the Great Martyr Ukrainian Catholic Church and its connection to the community through its function as a burial ground. A CHER was completed for this property and determined the cemetery was established in 1969. The property contains a cultural heritage landscape with design value as a representative example of a 20th century cemetery.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-158	Cemetery	N/A—Trull Cemetery, Baseline Road, Clarington	Previously identified by Amec Foster Wheeler in 2018 in the CHSR for the Oshawa to Bowmanville Expansion, Identified as a potential cultural heritage resource by Municipality of Clarington	The property contains a cemetery. The cemetery is a small family burial ground surrounded by a decorative wrought iron fence. There are several mature trees scattered throughout the cemetery. The gravestones are a mixture of materials and styles, including flat markers, arched and square upright limestone markers and more substantial upright granite markers. The burials range from 1856 to 1946 (Billion Graves 2021). The cemetery has potential historical or associative value from its connection to the Trull family, who were among the first families that settled in Courtice (Ontario Genealogy n.d.). Captain Trull also led a group of local settlers in a march during the Mackenzie Rebellion in 1837 (Ontario Genealogy n.d.).	
BHR-159	Residence	1558 Baseline Road, Clarington	Identified as a potential cultural heritage resource by Municipality of Clarington	The property contains a one and one-half storey residence with a front gable roof. The exterior of the residence is clad in wooden siding. Some of the windows appear to have wood frames. The door is obscured by vegetation. There is a full width, covered porch on the front (south) façade with square support beams holding up the roof and railing with square posts. The foundation is also obscured by vegetation. The residence was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The residence has potential design value as a representative early to mid-20th century Ontario vernacular residence. A CHER was completed for this property and determined the residence was likely built *circa* 1900. The residence is a relatively modest vernacular structure that resembles Folk Houses built across the American Midwest and Northeast from the mid-19th to early 20th century.	
BHR-160	Outbuilding	1580 Baseline Road, Clarington	Identified as a potential cultural heritage resource by Municipality of Clarington	The property contains a one and one-half storey outbuilding with a saltbox roof. The exterior of the outbuilding is clad in wood siding. The windows have eight to ten panes and wooden frames. The front (south) façade of the outbuilding has two garage style doors. The foundation is obscured by distance and equipment. The structure was likely built between 1939 and 1954 based on topographic mapping and aerial photography. The structure has potential design value as a representative early to mid-20th century Ontario vernacular outbuilding. A CHER was completed for this property and determined the outbuilding was a vernacular early 20th century structure.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-161	Residence	1598 Baseline Road, Clarington	Listed as a Primary Property on the Clarington Heritage Inventory[31]	The property contains a one and one-half storey residence with a side gable roof that has three gable dormers. The exterior of the residence is stone. There are voussoirs with keystones above the segmental arch window and door openings. The windows have wood frames and there is a wood door behind a modern glass storm door. The door also has sidelights and a transom window. The foundation is obscured. The residence was likely built between 1830 and 1878 based on the style and historic mapping. The residence has potential design value as a representative 19th century Gothic Revival structure. A CHER was completed for this property and determined the residence was built in 1872. The residence at 1598 Baseline Road is an example of Gothic Revival style architecture.	
BHR-162	Barn	1218 Trulls Road, Clarington	Identified during field review	The property contains a barn. The barn has a metal clad gambrel roof with the exterior of the structure clad in metal and an embankment on the north façade of the structure. The foundation is concrete blocks with stone quoins. Based on the barn's style and historical mapping, it was likely built in the late 19th century or early 20th century, sometime after 1878. The barn has potential design value as a representative late 19th to early 20th century Central Ontario barn. This style of barn is also known as a bank barn.	
BHR-163	Residence	1711 Baseline Road, Clarington	Listed as a Primary Property on the Clarington Heritage Inventory	This property contains a residence. The residence is a one and one-half storey structure with a metal clad side gable roof. The exterior is red brick. The residence has a full-width front porch with wooden railing, square support beams and decorative brackets. The upper story of the porch also has wooden railing with finials. The residence has modern windows and a modern door with a rectangular transom window above it. The foundation is obscured. The residence was likely built between 1860 and 1880 based on the style. The residence has potential design value as a representative 19th century Ontario vernacular structure.	

[31] Within the Municipality of Clarington, primary properties are considered "those that were the best examples of a particular style of architecture"

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-164	Barn	1108 Holt Road, Clarington	Identified during field review	This property contains a residence, which has been heavily modernized, a barn, and three silos. The barn has a cross gable roof clad in metal with four lightning rods. The exterior of the barn is clad in wood siding and there is an embankment on the north façade of the structure. The barn has a concrete foundation. The barn was likely built after 1900 or is a heavily modified barn that was built *circa* 1880. The barn has potential design value as a representative late 19th century Central Ontario barn. This style of barn is also known as a bank barn.	
BHR-165	Farmstead	1261 Holt Road, Clarington	Identified during field review	This property contains a residence, two barns and multiple outbuildings. The residence is a one and one-half storey structure with an L-shaped gable roof. The roof also has multiple centre gable dormers. The exterior of the residence is red brick with matching flat arch voussoirs above the window openings. The residence has modern windows and the entrance on the west façade facing the road has been bricked in. The foundation is obscured. The residence was likely built between 1830 and 1861 based on the style and historical mapping. One of the barns has a gable roof, clad in metal with three lightning rods. The exterior of the structure has been clad in metal. The foundation is stone. There is an embankment on the west façade of the structure. The barn was likely built between 1878 and 1890 based on historical mapping and the style. The barn has potential design value as a representative late 19th century Central Ontario barn. This style of barn is also known as a bank barn. The second barn has a gable roof, clad in metal with three lightning rods. The exterior of the structure is clad in wood timbering. The foundation and potential presence of an embankment are obscured by distance, the other barn, and some of the additional outbuildings. This barn has potential design value as a representative gable roof barn, built in Ontario during the mid-19th to early 20th century.	 
BHR-166	Barn	2185 Bloor Street, Clarington	Identified during field review	The property contains a residence which has been heavily modified, modern outbuildings, and a barn. The barn has a metal clad gable roof. The exterior of the barn is clad in timber siding. The barn also has a breezeway and hay loft. The foundation is obscured by distance. The barn was likely built in the mid- to late 19th century based on the style. The barn has potential design value as a representative gable roof barn.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-167	Farmstead	2228 Baseline Road, Clarington	Listed on Municipal Heritage Register	The property contains a residence, a barn, and several outbuildings. The residence is a one and one-half storey structure with a centre gable roof. The exterior of the residence is red brick with matching brick voussoirs above the window and door openings. The entrance on the front (south) façade has two side lights and a rectangular transom window. The foundation is stone. The residence was likely built between 1830 and 1878 based on the style and historical mapping. The residence has potential design value as a representative 19th century Ontario vernacular structure with Gothic Revival design influences. The barn has a gambrel roof clad in metal with five lightning rods. The exterior of the barn is clad in timber siding. The foundation is stone. The barn was likely built *circa* 1880 based on historical mapping and the style. The barn has potential design value as a representative late 19th century Ontario vernacular structure. A CHER was completed for this property and determined the residence at 2228 Baseline Road was likely built between 1847 and 1861. Based on the gambrel roof shape, the barn would have been a latter addition to the property likely added sometime after 1880. The residence is an example of a mid-19th century Ontario vernacular residence with limited Gothic Revival design influences. The barn is a representative example of late 19th to early 20th century barn design in Ontario.	 
BHR-168	Church	7 Pethick Street, Bowmanville	Identified during field review	The property contains a church. The building has an outshot gable roof. There is a spire in the centre of the west façade. The exterior of the building is clad in three colours of stucco. The windows and doors are modern. The foundation is obscured by distance. The church was likely built *circa* the late 1970s based on the style. The church has potential design value as a representative mid-century modern structure. The church is historically associated with the Church of Jesus Christ of Latter Day Saints.	
BHR-169	Residence	1490 Baseline Road West, Clarington	Identified for consideration by municipal staff	The property contains a residence. The residence is a two storey structure with a hip roof. The exterior of the residence is clad in siding. The residence contains modern sliding windows in rectangular openings. The foundation was not visible. There is a one storey gable roof wing of the residence on the west elevation that was not visible from the public RoW. The residence was likely built between 1900 and 1930 based on style and historical mapping. The residence has potential design value as a representative example of an early 20th century Ontario vernacular residence. A CHER was completed for this property and determined the residence was likely built between 1912 and 1916. The residence contains a massing consistent to early 20th century residential styles in Ontario, particularly the Edwardian style.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-170	Residence (converted to commercial)	1660 Baseline Road West, Clarington	Identified for consideration by municipal staff	The property contains a residence. The residence is a one-and-one-half storey structure with a cross-gable roof and a T-shaped plan. The exterior is clad in siding and the residence has a red brick chimney on the east elevation. The residence has a large shed roof dormer on the front (south) elevation. The residence contains modern sliding windows in rectangular openings and a modern composite door. The foundation is obscured. The residence was likely built between 1900 and 1930 based on style and historical mapping. The residence has potential design value as a representative example of an early 20th century Ontario vernacular residence. The property also contains modern storage locker facilities which do not have potential CHVI.	
BHR-171	Farmstead	1766 Baseline Road West, Clarington	Identified for consideration by municipal staff	The property contains a residence, a barn, and one outbuilding. The residence is a one storey structure with a side gable roof. The exterior of the residence is clad in stucco. The residence contains modern sliding windows. The main entrance on the front (south) elevation has a decorative door surround. The foundation was not visible from the public RoW. The residence was likely built between 1900 and 1930 based on the style and historical mapping. The residence has potential design value as a representative example of an early 20th century Ontario vernacular residence. The barn is a gable roof structure which is not visible from the public RoW due to heavy, mature tree coverage. A CHER was completed for this property and determined the residence had since been demolished. The barn at 1766 Baseline Road contains a gable roof and concrete foundation. The combination of the gable roof and concrete foundation suggests the barn was built between approximately 1900 and 1930 or was heavily modified to its approximate present-day appearance during this timeframe.	
BHR-172	Residence/Commercial	1825 Baseline Road West, Clarington	Identified for consideration by municipal staff	The property contains a residence, a commercial building, and two outbuildings. The residence is a one-and-one-half storey structure with a cross-gabled roof and a T-shaped plan. There is a red brick chimney on the east elevation. The exterior of the residence is clad in siding. The residence contains modern sliding windows and a modern composite door. There is a bay window on the east elevation. The residence has a full-width, shed roof porch with round support posts on the front (north) elevation. The residence's foundation is parged in concrete. The residence also has a one storey shed roof addition on the rear (south) elevation. The residence was likely built between 1900 and 1930 based on style and historical mapping. The residence has potential design value as a representative example of an early 20th century Ontario vernacular residence. The commercial building and two outbuildings are modern and do not have potential CHVI. They are modern structures not present on topographic mapping form 1976.	
BHR-173	Residence	334 Albert Street, Oshawa	Listed (Class A Property)	The property contains a residence. The residence is a one-and-one-half storey structure with a front gable roof. The exterior of the residence is clad in siding. The residence contains modern sliding windows in rectangular openings on the upper storey of the front (east) elevation and the side elevations. There is a large single pane window with a rectangular transom on the first storey of the front elevation and the residence contains a modern door. The residence has a full-width, flat roof porch on the front elevation with round support posts and square railings. The foundation is stone. The residence has a one storey, shed roof addition on the rear (west) elevation. The residence was likely built between 1900 and 1930 based on style and historical mapping. The residence has potential design value as a representative example of an early 20th century Ontario vernacular residence.	

CHR Reference Number	Type of Property	Location	Previous Heritage Recognition[30]	Description of Known or Potential CHVI	Photograph
BHR-174	Residence	24 Mill Street, Oshawa	Listed (Class B Property)	The property contains a residence. The residence is a one-and-one-half storey structure with a side gable roof and shed roof dormers on the front (south) and rear (north) elevations. The exterior of the residence is clad in siding. The residence contains modern sliding windows. There is evidence that a full-width porch has been removed from the front elevation. The foundation is parged in concrete. There is a one storey, shed roof addition at the rear of the residence. The residence was likely built between 1900 and 1930 based on style and historical mapping. The residence has potential design value as a representative example of an early 20th century Ontario vernacular residence.	
BHR-175	Residence	285 Celina Street, Oshawa	Listed (Class B Property)	The property contains a residence. The residence is a twoand one-half storey structure with a hip roof and gables dormers on the west and north elevations. The exterior of the residence is clad in red brick. There is a chimney on the south elevation. The residence contains modern windows in rectangular openings with red brick voussoirs. Arches with red brick drop molding located in the northwest corner of the residence provide access to the main entrance. The residence has a one storey, gable roof addition on the rear (east) elevation. The foundation is stone. According to the City of Oshawa heritage register, the residence was built in 1900. The residence has potential design value as an unusual example of early 20th century Ontario vernacular architecture.	
BHR-176	Residence	381 Celina Street, Oshawa	Listed (Class B Property)	The property contains a residence. The residence is a one and one-half storey structure with a side gable roof and a central front gable. The exterior of the residence is clad in siding. The residence contains modern windows in rectangular openings and a modern door. The residence has a partial-width shed roof porch on the front (west) elevation centred over the principle entrance. The foundation is stone. The residence has a one storey, gable roof addition at the rear. According to the City of Oshawa heritage register, this residence was built in 1900. The residence has potential design value as a representative 19th century Ontario vernacular structure with Gothic Revival design influences.	

4.9.2 Archaeology

Archaeological resources include artifacts, archaeological sites and marine archaeological sites, as defined under the OHA. The identification and evaluation of such resources are based upon archaeological fieldwork undertaken in accordance with the OHA.

The two Stage 1 AAs, involving background research and a property inspection, resulted in the determination that approximately 46% of the Archaeology Assessment Area retains low to no archaeological potential due to previous extensive disturbance from buried utilities, municipally constructed drains, asphalt and gravel roadways, a railway corridor, and extant structures. In accordance with Section 1.3.2 and Section 7.7.4 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), further AA is not required for any portion of the Project's anticipated construction which impacts an area of low to no archaeological potential.

Portions of the Archaeology Assessment Area retain low to no potential due to steep slope or is permanently low and wet, thus retaining low to no potential. In accordance with Section 2.1, Standard 2a-b of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), further AA is not required for any portion of the Project's anticipated construction which impacts an area of low to no archaeological potential.

Background research also demonstrated that, a small proportion of the Archaeology Assessment Area, has been subject to previous AA and not recommended for further study. In accordance with Section 1.1, Standard 1 and Section 7.5.8. Standard 4 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), further AA is not required for any portion of the Project's anticipated construction which impacts an area previously assessed and not recommended for further archaeological work.

A small portion of the Archaeology Assessment Area falls within the boundaries of the St. Wolodymyr and St. Olha Ukrainian Cemetery which was established in 1969. The St. Wolodymyr and St. Olha Ukrainian Cemetery property retains archaeological potential for archaeological resources not related to the cemetery and Stage 2 AA is recommended. Test-pit survey within the St. Wolodymyr and St. Olha Ukrainian Cemetery property should avoid directly impacting known burials. A Cemetery Investigation Authorization issued by the Bereavement Authority of Ontario is required in advance of invasive archaeological fieldwork within the cemetery property. Parts of the St. Wolodymyr and St. Olha Ukrainian Cemetery contain burials and cemetery investigation is recommended prior to construction impacts in these areas. Cemetery

investigation should only be completed after all required Stage 2 archaeological survey (and any subsequently recommended stages of AA) has been completed.

The remaining portion of the Archaeology Assessment Area, approximately 42%, retains potential for the identification and documentation of archaeological resources. Thus, in accordance with Section 1.3 and Section 7.7.4 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), Stage 2 AA is required for any portion of the Project's anticipated construction which impacts an area of archaeological potential.

Full details on the Stage 1 AAs can be found in Appendix A8.

5.0 Effects Assessment, Mitigation and Monitoring

5.1 Natural Environment

The Natural Environment Technical Report (NETR) assesses potential impacts to the natural heritage features and areas found within the Project Footprint and the adjacent lands (Natural Environment Assessment Area). The NETR addresses and investigates natural lands associated with designated features and policy areas, vegetation communities, wildlife and wildlife habitat, and aquatic habitats.

Potential effects are described below, while corresponding mitigation measures and monitoring activities are described in Section 5.10.

5.1.1 Aquatic Environment

5.1.1.1 Linear Facilities

Construction

Potential effects to the aquatic environment from linear facilities include erosion and sedimentation to wetlands/ waterbodies, headwater drainage features, and fish habitat from clearing and grading and construction of new tracks. Erosion and sedimentation activities can impact local fish species by changing different aspects of their local environment such as the water velocity, water temperature, food supply, and nutrient concentration. Erosion and sedimentation related to construction of linear facilities could potentially occur at the watercourses which are located in proximity to linear features: Goodman Creek, Unnamed Creek, Tooley Creek, Robinson Creek, and Tributaries of Darlington Creek 11 through 14 (refer to Figures 3.1 to 3.3 of Appendix A1 for location/definition of the Darlington Creek tributaries).

There is a risk of contamination to wetlands/waterbodies, headwater drainage features, and fish habitat from accidental spills from equipment being used on-site, however this risk is considered to be limited as a Spill Prevention and Response Plan will be developed before work commences so that procedures and policies are in place during construction to reduce impacts to wetlands and watercourses.

Operations

Potential effects to the aquatic environment will be limited during the operations phase. Maintenance activities conducted during the operations phase have the potential to affect the aquatic environment and headwater drainage features, with effects anticipated to be similar to those outlined for the construction phase above (i.e., erosion and sedimentation; accidental spills). The effect of maintenance activities would be expected to be temporary with localized disturbance in the areas where repairs and/or maintenance activities are required.

Stormwater runoff from the rail corridor has the potential to affect surface water quality draining to watercourses, as there is an increased potential for runoff to contain contaminants resulting from management activities (e.g., herbicides, etc.).

5.1.1.2 GO Station Locations

Construction

There are no aquatic features within approximately 400 meters (m) of three of the proposed GO stations (i.e., B1 Thornton's Corners East, B2 Ritson and B4 Bowmanville) and therefore no effects to the aquatic environment are anticipated at these locations during construction.

There is an unnamed drainage feature within the Project Footprint for the B3 Courtice GO Station. This headwater drainage feature originates at the outflow of the stormwater treatment facility located in the southwest corner for the existing Courtice Road Park and Ride. Additional surveys may be required to support any proposed removals or alterations to the existing head water drainage feature associated with the B3 Courtice GO Station development. The potential for sedimentation and erosion to the drainage feature will be mitigated using standard erosion control practices.

Operations

Potential effects are not anticipated for the aquatic environment during the operations phase of the GO stations given the distance from the GO stations to aquatic features. In addition, the future design of the B3 Courtice GO Station will consider the location of the head water drainage feature so that the function of the feature is maintained to the extent feasible.

5.1.1.3 Bridges

Construction

Potential effects resulting from the construction of bridges over Harmony Creek, and Farewell Creek includes removal of aquatic and riparian vegetation to accommodate machinery and construction activities, degradation of fish habitat resulting from dewatering and discharging activities, erosion and sedimentation to wetlands/waterbodies and fish habitat from construction, and risk of contamination to wetlands/waterbodies and fish habitat because of spills caused by equipment being used to construct bridges. Dewatering and discharge activities can affect local fish species by changing different aspects of their environment such as the water velocity, temperature of the water, food supply, and nutrient concentration.

There are other locations where bridges will be constructed or modified in proximity to watercourses or waterbodies. In these locations, no in-water works are proposed, however, indirect effects to watercourses / waterbodies from the construction work may occur. Indirect effects may include erosion within or adjacent to the waterbody / watercourse or sedimentation in the waterbody / watercourse.

The potential for sedimentation and erosion will be mitigated using standard erosion control practices (e.g., Erosion and Sediment Control (ESC) Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019)) and no negative effects are anticipated. The risk to the aquatic environment from accidental spills is considered to be limited as a Spill Prevention and Response Plan will be developed before work commences so that procedures and policies are in place during construction to reduce impacts to wetlands and watercourses.

Operations

Maintenance activities conducted during the operations phase have the potential to affect the aquatic environment, with effects anticipated to be similar to those outlined for the construction phase above (i.e., erosion and sedimentation; accidental spills). The effect of maintenance activities would be expected to be temporary with localized disturbance in the areas where repairs and/or maintenance activities are required.

5.1.2 Terrestrial Environment

5.1.2.1 Linear Facilities

Construction

During construction of linear facilities, tree and vegetation removal will be required to facilitate the new track and other linear facilities. There is also the potential for damage to adjacent vegetation or Ecological Land Classification (ELC) communities from accidental intrusion associated with the movement of construction vehicles. Since there will be vegetation removal, there is also an associated risk of invasive and incompatible species establishing in areas where clearing and grubbing occur. There is the potential for the spread of Emerald Ash Borer, *Agrilus planipennis* (Fairmaire) when removing, handling, and transporting ash trees. Most of the land within the rail corridor has been previously disturbed and features low-quality habitat, therefore additional disturbance from construction will have limited effects on the existing ecosystem.

Other potential impacts include increased erosion and sedimentation from construction practices (e.g., bringing in new material, grading, excavation), and soil or water contamination from spills (e.g., grease and/or fuel) due to equipment use within the Project Footprint.

Operations

During the operations phase for linear facilities, impacts to vegetation include removal and/or pruning as part of maintenance activities. As with construction, there is the potential for impacts to adjacent vegetation or ELC communities resulting from accidental intrusion during vegetation maintenance activities.

Soil or water contamination can potentially occur as a result of spills (e.g., grease and/or fuel) from equipment use during maintenance activities along the rail corridor, however as during the construction phase, standard spill mitigation measures will be employed to reduce potential impacts to the terrestrial environment.

5.1.2.2 GO Station Locations

Construction

Based on the proposed footprints of the GO station locations, direct loss of vegetation is anticipated to occur at the following types of ELCs:

- At Fox Street (B1 Thornton’s Corners East): Dry- Fresh- Mixed Meadow, Fresh-Moist Deciduous Woodland Ecosite, Treed Deciduous Hedgerow

- At Front Street (B2 Ritson): Mineral Cultural Woodland
- At Courtice Road (B3 Courtice): Agriculture, Dry- Fresh Deciduous Woodland Ecosite, Deciduous Forest, Agriculture-Hay, Meadow-Marsh, Mineral Cultural Thicket
- At Bowmanville Avenue (B4 Bowmanville): Mineral Cultural Meadow, and Treed Deciduous Hedgerow

To accommodate facilities associated with the GO station locations, vegetation will be removed and damage to adjacent vegetation or ELC communities can occur from accidental intrusion. Considering there is existing development at Front Street (B2 Ritson) and Courtice Road (B3 Courtice), the majority of vegetation clearing will occur at B1 Thornton's Corners East and Bowmanville Avenue (B4 Bowmanville) which do not have any existing infrastructure. Since there will be vegetation removal at these locations, there is an associated risk of invasive and incompatible species establishing in areas where clearing and grubbing occur. There is the potential for the spread of Emerald Ash Borer, *Agrilus planipennis* (Fairmaire) when removing, handling, and transporting ash trees.

Overall, the impact of GO station construction on the terrestrial environment is anticipated to be limited as most development is within previously disturbed areas with low-quality habitat. Some threatened species habitat will be removed at Courtice Road (B3 Courtice). Other potential impacts include increased erosion and sedimentation from construction practices (e.g., bringing in new material, grading, excavation), and soil or water contamination from spills (e.g., grease and/or fuel) due to equipment use within the Project Footprint.

Operations

No additional vegetation clearing is anticipated during operations of the GO stations and impacts would be limited to pruning, if required, during regular maintenance activities.

Soil or water contamination can potentially occur as a result of spills (e.g., grease and/or fuel) from equipment use during standard operations or maintenance activities, however as during the construction phase, standard spill mitigation measures (e.g., Spill Prevention and Response Plan will be employed to reduce potential impacts to the terrestrial environment.

5.1.2.3 Bridges

Construction

Effects during construction of bridges are anticipated to be similar to those described under linear facilities above (refer to Section 5.1.2.1) with the potential to affect larger areas of the terrestrial environment as there may be a greater area of disturbance around foundation works and some bridges are located in more sensitive areas (e.g., riparian vegetation).

Operations

Effects during operations of bridges are anticipated to be similar to those described under linear facilities above (refer to Section 5.1.2.1), however some bridges are located in more sensitive areas (e.g., riparian vegetation). As such, impacts to adjacent vegetation or ELC communities resulting from accidental intrusion during vegetation maintenance activities and soil or water contamination as a result of spills (e.g., grease and/or fuel) may have an increased effect.

5.1.3 Wildlife

5.1.3.1 Linear Facilities

Construction

Potential effects on wildlife from construction include direct mortality from construction vehicles, habitat destruction and reduced connectivity through vegetation removal, habitat degradation through spills, and sensory disturbance of wildlife during construction. However, the urban landscape and existing rail corridor precludes an abundance of wildlife and/or wildlife habitat. Furthermore, the majority of the wildlife (~90%) identified in the NETR (Appendix A1) are common in the province and considered generally tolerant to anthropogenic disturbances.

There is potential for construction to disturb or destroy nests of migratory birds, particularly during vegetation clearing and structural removal if undertaken from April 1 through August 31.

Other slow-moving and ground-dwelling wildlife could be encountered in work areas during construction, including reptiles (snakes and turtles) and amphibians.

Operations

During the operations phase for linear facilities, there is the potential for the disturbance or displacement of wildlife during vegetation maintenance activities. Vegetation maintenance would occur in previously disturbed areas in proximity to the rail corridor and therefore limited effects to wildlife are anticipated.

5.1.3.2 GO Station Locations

Construction

Similar to linear facilities (refer to Section 5.1.3.1), disturbance, displacement or mortality of wildlife could occur during construction of the GO station locations. The GO stations will have a larger property footprint in comparison to linear facilities, and therefore there may be greater effects to wildlife.

Operations

Once constructed, limited vegetation maintenance at GO stations is anticipated, other than maintenance of grassed areas (i.e., mowed areas of grass). Given the limited wildlife habitat offered in mowed areas, no effects to wildlife are anticipated.

5.1.3.3 Bridges

Construction

Similar to linear facilities (refer to Section 5.1.3.1), disturbance, displacement or mortality of wildlife could occur during construction of the bridges. Although, construction of bridges may potentially affect larger areas of wildlife habitat as there may be a greater area of disturbance around foundation works and some bridges are located in more sensitive areas.

Operations

Similar to linear facilities (refer to Section 5.1.3.1), there is the potential for the disturbance and displacement of wildlife during vegetation maintenance activities. As some bridges are located in more sensitive areas, there is an increased potential for effects to wildlife during maintenance activities.

5.1.4 Significant Wildlife Habitat

5.1.4.1 Linear Facilities

Construction

As documented in Section 4.1.1.4, there is both confirmed and candidate Significant Wildlife Habitat (SWH) within the Natural Environment Assessment Area. During the construction phase for linear facilities, there is the potential for the disturbance, displacement, or mortality of wildlife or habitat loss for the following SWH:

- confirmed habitat for bat maternity colonies
- confirmed habitat for Species of Conservation Concern (SOCC) (Eastern Wood-Pewee and Barn Swallow)
- candidate shrub/early successional bird breeding habitat
- candidate terrestrial crayfish habitat
- candidate habitat for SOCC (Yellow-banded Bumble Bee, Eastern Milksnake)

To the extent feasible, clearing of SWH will be focused on the areas required to construct linear facilities. As the rail corridor is existing, limited SWH clearing is anticipated.

Operations

During the operations phase for linear facilities, there is the potential for the disturbance or destruction of migratory bird nests during vegetation maintenance activities, particularly if undertaken from April 1 through August 31.

5.1.4.2 GO Stations Locations

Construction

During the construction phase for GO station locations, there is the potential for the disturbance, displacement, or mortality of wildlife or habitat loss for the following SWH:

- confirmed habitat for bat maternity colonies
- confirmed habitat for SOCC (Monarch)
- candidate for habitat for SOCC (Yellow-banded Bumble Bee; Eastern Milksnake)

To the extent feasible, clearing of SWH will be focused on the areas required to construct the GO stations. Two of the GO station locations (i.e., B2 Ritson and B3 Courtice) have existing infrastructure, and limited SWH clearing is anticipated at these locations.

Operations

During the operations phase for GO stations, there is the potential for the disturbance or destruction of migratory bird nests during vegetation maintenance activities, particularly if undertaken from April 1 through August 31.

5.1.4.3 Bridges

Construction

During the construction phase for bridges, there is the potential for the disturbance, displacement, or mortality of wildlife or habitat loss for the following SWH:

- confirmed habitat for bat maternity colonies
- confirmed habitat for SOCC (Barn Swallow, Eastern Wood-Pewee and Snapping Turtle)
- candidate habitat for turtle wintering areas
- candidate shrub/early successional bird breeding habitat
- candidate for terrestrial crayfish habitat
- candidate for habitat for SOCC (Yellow-banded Bumble Bee; Eastern Milksnake; Map Turtle and Midland Painted Turtle)

To the extent feasible, clearing of SWH will be focused on the areas required to construct bridges. Construction activities associated with bridges will occur in and around existing bridges and substantial expansion of footprint areas is not anticipated. If new bridges are being constructed, they will be constructed within the same approximate footprint as the existing bridge or directly adjacent to existing bridges (i.e., in the case of the bridges over Farewell Creek and Harmony Creek).

Operations

During the operations phase for bridges, there is the potential for the disturbance or destruction of migratory bird nests during vegetation maintenance activities, particularly if undertaken from April 1 through August 31.

5.1.5 Species at Risk

5.1.5.1 Linear Facilities

Construction

During the construction phase for linear facilities, there is the potential for the disturbance, displacement, or mortality of Species at Risk (SAR) or SAR habitat. The following SAR were confirmed in the Natural Environmental Assessment Area in proximity to linear facilities:

- Eastern Meadowlark
- SAR bats (i.e., Little Brown Myotis, Northern Myotis and Tri-colored Bat)
- Butternut
- Chimney Swift

Considering greater than 50% of the Project Footprint (~54%) and adjacent lands (~57%) were determined to be developed, disturbance or displacement of SAR or SAR habitat associated with linear facilities would occur within a mostly urban landscape. Rural areas within and adjacent to the Project Footprint have lower quality habitat, except around values and specific designated features. As such, effects are expected to be limited.

Operations

During the operations phase for linear facilities, there is the potential for habitat loss, disturbance and/or mortality to SAR bats during vegetation maintenance activities. Vegetation maintenance would occur in previously disturbed areas in proximity to the rail corridor and therefore limited effects to SAR are anticipated.

5.1.5.2 GO Station Locations

Construction

During the construction phase for GO stations, there is the potential for the disturbance, displacement, or mortality of SAR or SAR habitat. The following SAR were confirmed in the Natural Environmental Assessment Area in proximity to GO station locations:

- Bobolink
- Eastern Meadowlark

- SAR bats (i.e., Little Brown Myotis, Northern Myotis and Tri-colored Bat)

As Front Street (B2 Ritson) is a developed site no effects to SAR at this location are anticipated.

Operations

During the operations phase for GO stations, there is the potential for habitat loss, disturbance and/or mortality to SAR during vegetation maintenance activities. Vegetation maintenance would occur in previously disturbed areas in proximity to the GO stations and therefore limited effects to SAR are anticipated.

5.1.5.3 Bridges

Construction

During the construction phase for bridges, there is the potential for the disturbance, displacement, or mortality of SAR or SAR habitat. The following SAR were confirmed in the Natural Environmental Assessment Area in proximity to bridges:

- Blanding's Turtle
- SAR bats (i.e., Little Brown Myotis, Northern Myotis and Tri-colored Bat)
- Snapping Turtle

To the extent feasible, clearing of SAR habitat will be focused on the areas required to construct bridges. Construction activities associated with bridges will occur in and around existing bridges and substantial expansion of footprint areas is not anticipated. If new bridges are being constructed, they will be constructed within the same approximate footprint as the existing bridge or directly adjacent to existing bridges (i.e., in the case of the bridges over Farewell Creek and Harmony Creek).

Operations

During the operations phase for bridges, there is the potential for habitat loss, disturbance and/or mortality to SAR during vegetation maintenance activities. Vegetation maintenance would occur in previously disturbed areas in proximity to the bridges and therefore limited effects to SAR are anticipated.

5.1.6 Significant Natural Features

5.1.6.1 Linear Facilities

Construction

Areas where linear features will traverse significant natural features include the following locations:

- the Central Lake Ontario Conservation Authority (CLOCA) regulated area associated with Goodman Creek
- the CLOCA regulated area between Harmony and Farewell Creek
- the CLOCA regulated area and unevaluated wetland located at Robinson Creek
- the CLOCA regulated area and unevaluated wetland located at Tooley Creek
- the CLOCA regulated area and unevaluated wetland at Darlington Creek Tributaries 11, 13 and 14 (refer to Figures 3.1 to 3.3 of Appendix A1 for location/definition of the Darlington Creek tributaries)

Construction of linear facilities is anticipated to have limited effects on significant natural features given the existing rail corridor and other urban development in proximity to the linear facilities. Vegetation removal will be limited to only the areas required to accommodate the physical footprint of linear facilities and other directly adjacent areas required for construction activities. Since there will be vegetation removal, there is also an associated risk of invasive and incompatible species establishing in areas where clearing and grubbing occur.

Other potential impacts include increased erosion and sedimentation from construction practices (e.g., bringing in new material, grading, excavation), and soil or water contamination from spills (e.g., grease and/or fuel) due to equipment use within the Project Footprint.

Operations

During the operations phase for linear facilities, limited effects to significant natural features are anticipated as vegetation removal will be limited to maintenance activities. With vegetation removal, there is the potential for localized losses of habitat which may support local wildlife populations and SAR. There is the potential for a reduction in adjacent habitat quality as a result of increases in light, noise and dust generation during operations. However, as trains currently operate on the Canadian Pacific (CP) Rail corridor, this Project is not introducing new effects nor is it expected to substantially exacerbate existing light, noise and dust generation. As such, the effect on significant natural features is anticipated to be limited.

5.1.6.2 GO Station Locations

Construction

There are no significant natural features within approximately 500 m of the Fox Street (B1 Thornton's Corners East), Front Street (B2 Ritson) or Bowmanville Avenue (B4 Bowmanville) GO Station locations. The nearest point of CLOCA's regulated area around Tooley Creek to the Courtice Road (B3 Courtice) GO Station location is approximately 160 m to the east. Courtice Road lies between the B3 Courtice GO Station location and the regulated area. Considering the distance between B3 Courtice GO Station location and the regulated area, in addition to the separation by road, no potential effects to this significant natural feature are anticipated.

Operations

As noted above under the construction phase, given the distance between significant natural features and the GO stations, no effects during operations are anticipated.

5.1.6.3 Bridges

Construction

Various significant natural features could potentially be impacted by the construction of bridges including CLOCA regulated areas and the Greenbelt Natural Heritage System associated with Harmony Creek and Farewell Creek.

During the construction phase for bridges, vegetation will be removed within the footprint of the bridges and to accommodate construction activities. Vegetation removal and construction activities have the potential to result in disturbance/displacement or mortality of wildlife or habitat loss/degradation for potential SWH and SAR. Since there will be vegetation removal, there is also an associated risk of invasive and incompatible species establishing in areas where clearing and grubbing occur.

Other potential impacts include increased erosion and sedimentation from construction practices (e.g., bringing in new material, grading, excavation), and soil or water contamination from spills (e.g., grease and/or fuel) due to equipment use within the Project Footprint. Overall, the ecological function and integrity of significant natural features could be reduced in proximity to bridge work at Harmony Creek and Farewell Creek.

Operations

Although expected to be limited, vegetation removal may be required during operations for ongoing maintenance activities associated with bridges. With vegetation removal, there is the potential for localized losses of habitat which may support local wildlife populations and SAR, particularly at Harmony Creek and Farewell Creek where there is close proximity of significant natural features. Further, vegetation removal and operations activities have the potential to reduce habitat quality and natural heritage system ecosystem resilience related to edge habitat and invasive species proliferation.

There is the potential for a reduction in adjacent habitat quality as a result of increases in light, noise and dust generation during operations. Nuisance effects from operations, such as light and noise, can potentially reduce species movement throughout natural heritage system corridors. However, as trains currently operate on the CP Rail corridor, this Project is not introducing new effects nor is it expected to substantially execrable existing light, noise and dust generations. As such, the effect on significant natural features is anticipated to be limited.

5.2 Tree Inventory

The Project has the potential to impact trees within the Project Footprint during construction and operations either through removal, injury (i.e., unintended damage) or pruning (i.e., selective removal or reduction of parts of a tree). Potential effects are described below, while corresponding mitigation measures and monitoring activities are described in Section 5.10. Removal has been recommended for 1,797 living trees that are within the proposed non-electrified zones 1 to 2 or other impacted areas within the Project Footprint. An additional 225 dead trees have been recommended for removal as they present a potential hazard. The number of trees to be removed or protected in place are considered approximate and may change as design progresses.

5.2.1 Linear Facilities

Construction

The majority of tree removals for the Project are associated with linear facilities given the extent of the proposed rail expansion. Other construction-related effects to retained trees can include removal or impacts to tree roots, soil compaction and physical damage to roots, trunk, limbs, and/or foliage. Impacts to retained trees may also occur through equipment strikes, equipment-related compaction to soil, idling machinery, or pruning.

Operations

It is not anticipated that remaining trees along linear facilities will be affected during operations as there will be no additional footprint changes associated with the Project and the potential for impacts to existing trees will be limited to regular pruning or maintenance required as needed to maintain rail operations.

5.2.2 GO Station Locations

Construction

Tree removals will be required to construct the new GO stations and associated facilities. For all GO station sites, further assessment will be required as design for the GO stations progresses.

Other construction-related effects to retained trees can include removal or impacts to tree roots, soil compaction and physical damage to roots, trunk, limbs, and/or foliage. Impacts to retained trees may also occur through equipment strikes, equipment-related compaction to soil, idling machinery, or pruning.

Operations

It is not anticipated that remaining trees at GO station sites will be affected during operations, as there will be no additional footprint changes associated with the Project and the potential for impacts to existing trees will be limited to pruning or maintenance as required.

5.2.3 Bridges

Construction

Bridge modifications will include reconstruction of existing bridges, widening of existing bridges and construction of new bridges, including multi-use crossings. Tree removals will be required to facilitate the entry/exit of construction equipment in and around the bridges, as well as tree removals for the bridge footprints. Other construction-related effects to retained trees can include removal or impacts to tree roots, soil compaction and physical damage to roots, trunk, limbs, and/or foliage. Impacts to retained trees may also occur through equipment strikes, equipment-related compaction to soil, idling machinery, or pruning.

Operations

It is not anticipated that remaining trees near bridges will be affected during operations as there will be no additional footprint changes associated with the Project and the potential for impacts to existing trees will be limited to regular pruning or maintenance, as required.

5.3 Geology and Groundwater

The Project is not expected to result in any changes to landforms and physiography or to soils and bedrock geology but does have the potential to result in temporary effects to groundwater during construction and operations (i.e., accidental spills).

It is anticipated that effects can be limited or avoided through implementation of mitigation measures. Potential effects are described below, while corresponding mitigation measures and monitoring activities relating to Geology and Groundwater are described in Section 5.10.

5.3.1 Landforms and Physiography

5.3.1.1 Linear Facilities

Construction

No direct or indirect effects to landforms and physiography are anticipated during construction. Trackwork will be placed at-grade within the existing rail corridor and surficial activities will not result in any changes to the overall landscape.

Operations

No direct or indirect effects to landforms and physiography are anticipated during operations as there will be no changes to the overall landscape once construction is complete.

5.3.1.2 GO Station Locations

Construction

No direct or indirect effects to underlying landforms and physiography are anticipated during construction. Only localized changes in elevation limited to the Project Footprint will be required, so no direct or indirect effects to underlying landforms and physiography are anticipated on a larger geographic scale.

Operations

No direct or indirect effects to underlying landforms and physiography are anticipated during operation as there will be no changes to the overall landscape once construction is complete.

5.3.1.3 Bridges

Construction

No direct or indirect effects to underlying landforms and physiography are anticipated during construction.

Operations

No direct or indirect effects to underlying landforms and physiography are anticipated during operation as there will be no changes to the overall landscape once construction is complete.

5.3.2 Soils and Bedrock Geology

5.3.2.1 Linear Facilities

Construction

Spills and releases associated with Project construction may affect on-site soil quality. In addition, stripping of the existing surficial organics and topsoil will be required as part of construction.

Bedrock has been reported at various locations within the Project Footprint at depths ranging from 2.1 m to 16.5 m below ground surface (mbgs) (Stantec 2021). No interaction with bedrock is anticipated during construction of tracking. Retaining walls will be required throughout the rail corridor. In some locations, deep foundation support may be required for the retaining walls but supports are not anticipated to interact with bedrock.

The Limited Phase I ESA identified medium and high-risk properties along the rail corridor and the geotechnical studies (Golder Associates Ltd. 2022a to 2022d; WSP Canada Inc. 2023a, 2023e to 2023h) identified exceedances of Table 1 and 2 Site Condition Standards (SCS), which present an increased risk of contamination through the excavation, movement and management of soil at these locations. Soil characterization may be required, where needed, to handle, manage and dispose of excavated material in accordance with O. Reg. 406/19.

Operations

No effects to soils and bedrock are anticipated during operations as there will be no ongoing excavation work following construction that will disturb soil or bedrock.

5.3.2.2 GO Station Locations

Construction

Spills and releases associated with Project construction may affect on-site soil quality. In addition, stripping of the existing surficial organics and topsoil will be required as part of construction.

Bedrock has been reported at various locations within the Project Footprint at depths ranging from 2.1 m to 16.5 mbgs (Environmental Risk Information Services, ERIS). Depending on the construction methodology and detailed design of the GO station locations, there is the potential for interactions with bedrock.

The Limited Phase I ESA identified medium and high-risk properties near or on GO station locations, which present an increased risk of contamination through the excavation, movement and management of soil at these locations. Soil characterization may be required, where needed, to handle, manage and dispose of excavated material in accordance with O. Reg. 406/19.

Operations

No effects to soils and bedrock are anticipated during operations as there will be no ongoing excavation work following construction that will disturb soil or bedrock.

5.3.2.3 Bridges

Construction

Spills and releases associated with Project construction may affect on-site soil quality. In addition, stripping of the existing surficial organics and topsoil will be required as part of construction.

Bedrock has been reported at various locations within the Project Footprint at depths ranging from 2.1 m to 16.5 mbgs (ERIS). Interaction between bridge piers and bedrock is possible.

The Limited Phase I ESA identified medium and high-risk properties along the rail corridor in proximity to proposed bridge locations and the geotechnical studies (Golder Associates Ltd. 2022a to 2022d; WSP Canada Inc. 2023a, 2023e to 2023h) identified exceedances of Table 1 and 2 Site Conditions Standards (SCS), which present an increased risk of contamination through the excavation, movement and management of soil at these locations. Soil characterization may be required, where needed, to handle, manage and dispose of excavated material in accordance with O. Reg. 406/19.

Operations

No effects to soils and bedrock are anticipated during operations as there will be no ongoing excavation work following construction that will disturb soil or bedrock.

No effects to soils and bedrock are anticipated during operations as there will be no interaction between bridges and soils or bedrock.

5.3.3 Groundwater Resources

5.3.3.1 Linear Facilities

Construction

Spills and releases associated with machinery and equipment operation during construction activities may affect groundwater quality through contamination. There is potential for this interaction to occur along linear facilities, however, accidental releases would be localized in nature. As noted above for linear facilities (Section 5.3.2.1), medium and high-risk properties have been identified along the rail corridor, which present an increased risk of contamination through the excavation, movement and management of soil at these locations.

Groundwater control during foundations for the retaining walls may be required during construction.

Nine domestic wells were identified within 50 m of the Project Footprint. Given the distance of the wells from the construction activities and the limited excavation anticipated for linear facilities in the area of the wells, no interaction with the wells or groundwater supply is anticipated.

Operations

Overall trackwork will be surficial and minor foundational work associated with the retaining walls work is not anticipated to required ongoing dewatering.

5.3.3.2 GO Station Locations

Construction

Spills and releases associated with machinery and equipment operation during construction activities may affect groundwater quality through contamination. There is potential for this interaction to occur, however, accidental releases would be localized in nature.

Groundwater control during installation of foundations for the GO stations and associated infrastructure may be required during construction.

Two domestic wells are located within the Project Footprint at the Bowmanville Avenue (B4 Bowmanville) GO Station. The wells were installed in 1970 and 1971. Metrolinx owns the GO station property, and the wells are not currently used for domestic purposes. It is anticipated the wells will be decommissioned during the development of the GO station. One additional domestic well installed in 1983 is located within the 50 m buffer of the Project Footprint, on the east side of Bowmanville Avenue. No effects to this well are anticipated during construction activities.

Operations

During operations, no interaction with groundwater is anticipated for the Project as there will be no need for active dewatering once structures are established and therefore no impacts are expected.

5.3.3.3 Bridges

Construction

Spills and releases associated with machinery and equipment operation during construction activities may affect groundwater quality through contamination. There is potential for this interaction to occur, however, accidental releases would be localized in nature.

As noted above for linear facilities (Section 5.3.2.1), medium and high-risk properties have been identified along the rail corridor, which present an increased risk of contamination through the excavation, movement and management of soil at these locations (Golder Associates Ltd. 2022a to 2022d; WSP Canada Inc. 2023a to 2023h). Groundwater samples showed exceedances of some parameters in comparison to the Regional Municipality of Durham's Sewer Use By-law and PWQO, which also present an increased risk of contamination should dewatering discharge not be properly handled.

Groundwater control during foundations for the bridges may be required during construction.

Operations

During operations, no interaction with groundwater is anticipated as bridge abutments will be designed to avoid the need for permanent dewatering and therefore no impacts are expected.

5.4 Stormwater Management

Stormwater Management (SWM) aims to maintain the natural hydrologic cycle, avoid an increased risk of flooding, prevent undesirable stream erosion, and protect water quality. Potential effects are described below, while corresponding mitigation measures and monitoring activities relating to SWM are described in Section 5.10.

5.4.1 Linear Facilities

Construction

Construction of linear facilities has the potential to result in increased sediment transport into adjacent drainage infrastructure and waterbodies as grading / soil movement will be required. Given the length of the linear facilities, the potential for sediment transport into drainage infrastructure and waterbodies extends throughout the length of the Project Study Area.

The proposed corridor expansion will impact existing drainage ditches along the rail corridor as the new GO tracks will encroach on the existing ditches reducing or eliminating the ditch capacity and ability to convey the 100-year storm event. However Project design will consider opportunities to improve drainage along the length of the tracks. Water quality treatment for the extended corridor will also be addressed through the implementation of vegetated slopes (buffer strips), pervious ballast and vegetated conveyance swales throughout.

The proposed track and associated ballast within the existing rail corridor will result in negligible increases in the level of imperviousness and runoff from the corridor. The existing vegetated embankments will be replaced with ballast/tracks, which will provide increased retention and passive infiltration into the track/roadbed. Use of rock checks along open ditches will be considered to provide passive rainfall capture, infiltration, and evapotranspiration for water balance and erosion control. The net impact on water quantity with the application of these design approach is expected to be negligible toward receiving drainage infrastructure and surface water features along the corridor.

Areas where linear features will traverse floodplain areas include the following locations:

- the CLOCA regulated area associated with Goodman Creek
- the CLOCA regulated area associated with Oshawa Creek
- the CLOCA regulated area between Harmony and Farewell Creek
- the CLOCA regulated area and unevaluated wetland located at Robinson Creek
- the CLOCA regulated area and unevaluated wetland located at Tooley Creek
- the CLOCA regulated area and unevaluated wetland at Darlington Creek Tributaries 11, 13 and 14 (refer to Figures 3.1 to 3.3 of Appendix A1 for location/definition of the Darlington Creek tributaries)

There is the risk of on-site flooding during construction activities within these areas.

Operations

Hydraulic and fluvial geomorphic assessments are being undertaken for the Project to support the engineering design. The Project will be designed and constructed in accordance with the recommendations from these assessments.

With the implementation of stormwater management strategies, no effects related to stormwater are anticipated during operations. The linear features associated with the Project will not require changes to land uses and surface cover once operational and as such, there will be no increase of sediment transport over existing conditions. Relocated stormwater utilities will be put in place during the construction phase and function throughout the operations phase of the Project.

5.4.2 GO Station Locations

Construction

In some locations, substantial clearing and grubbing may be required to facilitate the construction of the GO stations which has the potential to result in sediment transport into adjacent drainage facilities.

Construction of the GO stations also has the potential to affect SWM as there will be an increase in impervious surface area which may affect the amount and direction of water infiltration and flows. The landscape will be altered to accommodate parking, platform, and other GO station facilities.

Operations

Future operations will not affect the flow of stormwater within or beyond the GO stations, as the detailed design for the GO stations will include consideration of stormwater flows. Conversion of existing and installation of new SWM features will account for changes to the GO station sites, and existing drains and ditches will be extended and realigned as required.

5.4.3 Bridges

Construction

Construction of bridges, both over waterbodies and the rail corridor, has the potential to result in increased sediment transport into adjacent drainage infrastructure and waterbodies as grading / soil movement will be required.

Areas where bridges will traverse floodplain areas include Harmony Creek and Farewell Creek. There is the risk of on-site flooding during construction activities within these areas.

Operations

With the implementation of SWM strategies, no effects on the flow of stormwater are anticipated during operations.

Hydraulic and fluvial geomorphic assessments are being undertaken for the Project to support the engineering design. The Project will be designed and constructed in accordance with the recommendations from these assessments. Bridges over waterbodies (i.e., at Harmony Creek and Farewell Creek) will be sized to maintain or improve local flood levels and will be supported by hydraulic calculations and modelling.

5.5 Air Quality

The Project has the potential, at times, to result in temporary air quality impacts during construction as a result of increased fugitive dust emissions, construction equipment tailpipe emissions, vehicle emissions and associated dust, and train locomotive emissions. Mitigation measures have been identified to avoid or reduce potential adverse effects (refer to Section 5.10).

5.5.1 Linear Facilities

Construction

As described in Section 3.5.2, the extent from the Farewell Street Multi-Use Bridge to west of the Harmony Road Bridge was selected as the representative location for air quality assessment for trackwork and grading as multiple critical and sensitive receptors were identified to be closest to this segment of the track compared with other locations. This representative location was selected to identify a probable maximum impact level for assessment purposes, but this provides flexibility in determining a less impactful construction approach with more controlled assumptions to avoid the potential for air quality exceedances.

In general, grade preparation, infrastructure installation activities, material handling, fabrication and construction vehicle movement will result in dust generation and other emissions. Construction activities could also expose contaminated soils/materials and/or result in the spreading of contaminated materials. Emissions from the contaminated materials may pose risks to human health and wellbeing.

The modelling results were based on a maximum construction emissions scenario and to coincide with worst-case meteorology with standard mitigation measures applied. Standard mitigation measures include dust control such as watering and limiting on-site vehicle speed to less than 20 km/hr. Each modelled maximum emissions scenario is not expected to occur consistently throughout the entire construction period. The intent of these predictions is to help identify potential air quality impacts and whether additional mitigation measures (summarized in Section 5.10 and fully discussed in Appendix A3) may be required to reduce these impacts.

The modelling results indicate that predicted concentrations due to construction activities meet the provincial and national air quality criteria and standards most of the time (maximum prediction concentrations at a sensitive receptor meet criteria and standards 99.9% of the time) under a maximum construction emissions scenario in which no additional mitigation measures other than standard methods are applied. On occasion, the maximum emissions scenario impacts are predicted by the modelling to exceed the provincial and national air quality criteria and standards when no additional

mitigation measures are implemented other than standard construction mitigation measure. When this occurs, the area of exceedance is relatively small and within 100 m (based on applicable provincial and/or federal criteria) of the construction activities. Scheduling construction activities to avoid the maximum emissions scenario occurring (i.e., reducing the number of activities/equipment operating concurrently as much as possible) will aid in reducing the potential for adverse effects. With the implementation of the additional recommended mitigation measures (summarized in Section 5.10 and fully discussed in Appendix A3), impacts from construction can be effectively managed to acceptable levels.

Operations

For the Project, an increased number of GO train locomotives will be operational in addition to the CP and General Motors train locomotives currently operating within the corridor. In addition, the GO bus traffic volumes are expected to increase at the Clarington Boulevard / Durham Hwy 2 bus loop which is also the proposed location of the B4 Bowmanville GO Station.

Air quality impacts from the Project are predicted to meet the provincial and national air quality criteria and standards for all of the assessed air contaminants of interest (COIs) except for nitrogen dioxide (NO_2). NO_2 concentrations exceed the 1-hour and annual Canadian Ambient Air Quality Standards (CAAQS) by 145% and 6%, respectively. It should be noted that the NO_2 CAAQS are intended for regional air quality planning rather than assessing the local impacts of individual projects, and that the NO_2 concentrations for all scenarios are below the provincial criteria.

When background concentrations are considered along with estimated Project emissions (cumulative predictions), all of the assessed COIs are predicted to meet the provincial and national air quality criteria and standards except for NO_2, benzene and benzo(a)pyrene. Predicted NO_2 concentrations exceed the 1-hour and annual CAAQS for the operation phase by 212% and 125%, respectively, but remain below the provincial criteria. The maximum cumulative annual average benzene, and 24-hour and annual average benzo(a)pyrene concentrations are above their respective criteria by 32%, 252% and 844% respectively. However, existing background levels of benzene and benzo(s)pyrene are already above their respective air quality criteria (exceeding by 19%, 178% and 758%, respectively), with the Project only contributing a small amount to the cumulative levels.

5.5.2 GO Station Locations

Construction

Bowmanville Avenue (B4 Bowmanville) was selected as the representative worst-case location GO station for assessment as multiple critical and sensitive receptors were identified to be closest to this GO station compared with the other GO station locations. Similar to linear facilities (as described in Section 5.5.1), construction of GO stations will result in air emissions due to grade preparation, infrastructure installation activities, material handling, dust generation and other emissions. However, air quality effects during construction of GO stations will be limited to those receptors in the vicinity of the proposed sites as opposed to being corridor-wide (i.e., for linear facilities).

As per Section 5.5.1, modelling was based on maximum emission and worst-case meteorology to provide conservative results. Based on the modelling results, it was determined that with the implementation of the additional recommended mitigation measures (summarized in Section 5.10 and fully discussed in Appendix A3), impacts from construction can be effectively managed to acceptable levels.

Operations

Potential air quality impacts associated with operations at GO stations could include effects from fuel combustion at GO stations, train operations, maintenance activities, GO bus service and parking.

As per Section 5.5.1, air quality impacts from the Project are predicted to result in an exceedance of NO_2 concentrations for the Canadian Standards, but not the provincial criteria.

5.5.3 Bridges

Construction

As described in Section 3.5.2, Simcoe Street Bridge was selected as the representative bridge for assessment as multiple critical receptors were identified to be closer to the Simcoe Street Bridge footprint relative to the other bridge locations. For this bridge, modelling was conducted for the following two cases:

1. Bridge Reconstruction including Simcoe Street traffic being re-routed onto detour roads
2. Bridge Reconstruction without considering emissions from re-routed traffic detour roads

The results of the construction impact for Case 1 represents the worst-case construction scenario for the Simcoe Street Bridge Construction, whereas the construction impacts without detour roads (Case 2) predicts the impact of the bridge reconstruction vehicles/activities alone. The results of Case 2 are used to predict the impacts of bridge reconstruction activities for the other bridge locations. Similar to linear facilities (as described in Section 5.5.1), construction of bridges will result in air emissions due to grade preparation, infrastructure installation activities, material handling, dust generation and other emissions. However, air quality effects during construction of bridges will be limited to those receptors in the vicinity of the proposed sites as opposed to being corridor-wide (i.e., for linear facilities).

As per Section 5.5.1, modelling was based on maximum emission and worst-case meteorology to provide conservative results. Based on the modelling results, it was determined that with the implementation of the additional recommended mitigation measures (summarized in Section 5.10 and fully discussed in Appendix A3), impacts from construction can be effectively managed to acceptable levels.

Operations

Air quality impacts will be driven by the increased train traffic volumes along the rail corridor and not the structural components (i.e., bridges). The potential for operations air quality impacts as a result of the rail corridor (i.e., linear facilities) is discussed above in Section 5.5.1. No change in air quality from existing conditions is expected as the bridges will not be an additional source of air emissions once operational.

5.6 Noise and Vibration

The Project has the potential to result in noise and vibration effects during Project construction activities (e.g., heavy equipment operation, piling driving, etc.). The potential for effects during operation will be limited, once permanent infrastructure is established. Potential effects are described below, while corresponding mitigation measures and monitoring activities relating to noise and vibration are described in Section 5.10. It is anticipated that effects can be limited or avoided through implementation of mitigation measures.

5.6.1 Linear Facilities

Construction

Construction of linear facilities will require grade preparation activities including vegetation removal, earth moving, excavation, and backfilling which uses heavy construction equipment. Heavy equipment use related to grade preparation and infrastructure installation activities may have noise and vibration impacts on nearby sensitive receptors. Noise and vibration associated with construction activities may occur on evenings and weekends throughout the construction phase.

Potential noise and vibration effects extend the full length of the proposed alignment at applicable sensitive receptors. The impacts of noise and vibration within the Zone of Influence (ZOI) will be mitigated to the extent feasible with appropriate equipment setbacks, the installation of temporary noise barriers, and monitoring of noise and vibration levels. Further, increases in noise and vibration will be temporary in nature and are considered to be a short-term nuisance to nearby sensitive receptors.

Operations

The noise effects due to rail operations were predicted at the 89 representative PORs and compared to the pre-Project sound levels, as required by the Metrolinx Environmental Guide (Metrolinx 2019b) and the MOEE/GO Draft Protocol (1995). The analysis of the noise modeling results indicate that predicted effects were above the MOEE/GO Draft Protocol (1995) limits at five of the 89 PORs (i.e., POR003 (Façade, POR042 Façade, POR042 OLA, POR043 Façade, POR043 OLA), where adjusted daytime noise impacts are between 5 to 6 dB and will require mitigation. Based on the MOEE/GO Draft Protocol (1995) mitigation measures are evaluated based on administrative, operational, economic and technical feasibility. New noise barriers were determined to be feasible and are proposed to mitigate the predicted noise levels at the PORs with exceedances. With the noise barriers in place, operational noise generated by future rail activities at the surrounding receptors are expected to meet the applicable noise limits. Adjusted daytime noise impacts at the remaining PORs were <5 dB and do not require mitigation as per the MOEE/GO Draft Protocol (1995). No nighttime exceedances were predicted at any of the PORs.

A criterion for operation vibration was determined based on the measured vibration levels generated by the existing CP Rail train movements. Based on the measurements, and in accordance with the MOEE/GO Draft Protocol (1995), a vibration limit of 0.175 mm/s was considered for the Project operation rail vibration assessment and was used to assess vibration levels for annoyance. Vibration during operations is expected to exceed the vibration criteria of 0.175 mm/s at PORs 009, 014, 031, 042, 043, 047 which may result in general annoyance at these receptors in the absence of mitigation

measures. Ballast mats are recommended as a mitigation measure and are expected to result in a decreased in vibration levels of 10 dB. Therefore, mitigated vibration from rail operations is expected to be within the MOEE/GO Draft Protocol (1995) limits.

Rail squeal noise resulting from the movement of trains around curves is a very complex phenomenon. Track curve radii under 305 m has a potential for wheel squeal noise from rail. No rail under curve radii of 305 m is identified along the corridor, except the one at the current spur line connecting to the CP Rail main line. This curved track is currently used by the CP Rail spur line that connects from the Canadian National (CN) to CP Rail main line. A GO station (i.e., B1 Thornton's Corners East) is proposed at this location and trains are expected to stop and/or move at reduced speed at this location. As the trains are moved around the curved tracks, the wheels have the potential to produce a squeal. It is recommended that curved portions of the track at GO Station B1 should be designed and lubricated at the curve as part of general track maintenance to minimize or eliminate rail squeal noise.

5.6.2 GO Station Locations

Construction

Potential noise and vibration effects during construction of GO stations will be similar to those described above for linear facilities (refer to Section 5.6.1). However, noise and vibration effects during construction of GO stations will be limited to those receptors in the vicinity of the proposed sites as opposed to being corridor-wide (i.e., for linear facilities).

The impacts of noise and vibration within the ZOI will be mitigated to the extent feasible with appropriate equipment setbacks, the installation of temporary noise barriers, and monitoring of noise and vibration levels. Further, increases in noise and vibration will be temporary in nature and are considered to be a short-term nuisance to nearby sensitive receptors.

Operations

There is the potential for stationary noise sources at the GO stations to exceed relevant criteria based on the predicted operations noise levels, without the application of mitigation measures. The assessment indicated the anticipated sound levels generated by GO station operations are above applicable MECP NPC-300 criteria at some of the receptors at the Front Street (B2 Ritson), Courtice Road (B3 Courtice), and Bowmanville Avenue (B4 Bowmanville) GO Stations.

The noise impact of the layover facility and fueling operations east of Bowmanville Avenue (B4 Bowmanville) GO Station are above the applicable MECP NPC-300 criteria at the representative receptors east of Bowmanville Avenue. Idling locomotives at the layover facility were modeled at the east end of the trains due to operational requirements. If locomotives are placed at the west end of trains, predicted sound levels would also exceed applicable noise criteria at PORs adjacent to the Bowmanville Avenue (B4 Bowmanville) GO Station.

Noise barriers measuring 5 m in height are recommended for all GO stations. With the recommended noise barriers in place, GO station and layover facility stationary noise and future operational noise from rail activities at the surrounding receptors are expected to meet the applicable noise limits. Mitigation to reduce operational noise generated by layover activities at POR093 is not feasible given the proposed development is a 25-storey high-rise building overlooking the proposed layover yard. No other feasible at-source mitigation measures were identified. There may be at-receptor mitigation measures that could be considered during the detailed design phase of the Project and during the land use planning and approval process for this development.

The noise impact of emergency generators at the GO stations and the layover facility during planned non-emergency operation (e.g., during testing) were assessed separately by predicting noise levels at the surrounding receptors and comparing with the applicable MECP limits. Predicted sound levels are within the MECP limits and no potential effects are anticipated.

5.6.3 Bridges

Construction

Potential noise and vibration effects during construction of bridges will be similar to those described above for linear facilities (refer to Section 5.6.1), with the addition of potential noise and vibration impacts associated with pile driving which may be required at some bridge locations. The noise and vibration impacts during construction will vary depending on the type of bridge modification (i.e., widening, reconstruction, new bridge) and the proximity of sensitive receptors.

The impacts of noise and vibration within the ZOI will be mitigated to the extent feasible with appropriate equipment setbacks, the installation of temporary noise barriers, and monitoring of noise and vibration levels. Further, increases in noise and vibration will be temporary in nature and are considered to be a short-term nuisance to nearby sensitive receptors.

Operations

Noise and vibration impacts will be driven by the increased train traffic volumes along the rail corridor and not the structural components (i.e., bridges). The potential for operations noise and vibration as a result of the rail corridor (i.e., linear facilities) is discussed above in Section 5.6.1. No change in noise and vibration from existing conditions is expected as the bridges will not be an additional source of noise or vibration once operational.

5.7 Socio-Economic and Land Use Characteristics

This effects assessment identifies potential socio-economic and land use effects associated with the construction and operations phases of the Project and proposes mitigation and monitoring measures where potential effects are predicted, aiming to avoid or reduce these adverse effects. The assessment of potential effects and appropriate mitigation measures in this section specifically addresses Project effects on land use and property, built form and visual characteristics, and utilities. Overall, the Project conforms with provincial and municipal land use policies, which prioritize developments in major transit corridors through an increase in mix of uses that are supportive of future use of transit. Potential effects related to traffic and transportation are discussed in Section 5.8.

5.7.1 Land Use and Property

Land use and property refers to the changes in land use or property ownership, through either permanent or temporary property acquisition, changes in access, and nuisance effects that may result from construction and operations of the Project.

5.7.1.1 Linear Facilities

Construction

As most construction activities will take place within the existing rail and road corridors, no changes in land use are anticipated for trackwork, bridges/overpasses and at-grade crossing widenings. Project components that require permanent land acquisition and result in a change in land use may require discussions with municipalities regarding alignment with existing official plans and zoning requirements.

Construction of the Project according to the current design will result in permanent property acquisitions and temporary easements, as summarized in Table 5.1. Potential temporary or permanent easements and permanent property acquisitions are denoted by a "●". If no potential property acquisition or easement is anticipated in a given section, a "-" is indicated. Specific property requirements will be determined during the detailed design stage, should there be any deviations from the conceptual design.

Table 5.1: Summary of Proposed Permanent and Temporary Property Impacts within the Project Footprint

Section Description	Temporary Easement	Permanent Easement	Permanent Partial Property Acquisition
Northeast of the existing DC Oshawa GO and south of the 401 on the west side of the rail corridor	-	●	●
North of Champlain Avenue to the termination of Fox Street on the east side of the rail corridor	●	-	●
Termination of Fox Street to Cromwell Avenue on the south side of the rail corridor	●	●	●
Cromwell Avenue to the eastern termination of Sinclair Avenue on the south side of the rail corridor	●	-	●
East of the termination of Sinclair Avenue to the western termination of Hall Street on the south side of the rail corridor	●	●	●
East of the western termination of Hall Street to Howard Street on the south side of the rail corridor	●	●	●
Howard Street to Farewell Street on the south side of the rail corridor	-	●	●
Northwest side of Farewell Street on the north side of the rail corridor	-	-	●
East of Farewell Street to Tennyson Court on the south side of the rail corridor	-	●	●
East of Tennyson Court to Bloor Street on the south and west side of the rail corridor	●	●	●
Bloor street to Southwest of Southport Drive on the southwest side of the rail corridor	-	●	●
Southwest of Southport Drive to Prestonvale Road on the southwest and south side of the rail corridor	-	-	●
Prestonvale Road to Trulls Road on the south side of the rail corridor	●	-	●

Section Description	Temporary Easement	Permanent Easement	Permanent Partial Property Acquisition
Trulls Road to Courtice Road on the south side of the rail corridor	-	-	●
Courtice Road to Hancock Road on the south side of the rail corridor	-	●	●
Hancock Road to Holt Road on the south and west side of the rail corridor	-	-	●
Holt Road to Green Road on the south side of the rail corridor	-	●	●
Green Road to Martin Road on the south side of the rail corridor	-	●	●

Complete or partial acquisition of privately held properties and the issuance of temporary easements will directly affect residential properties and commercial businesses through changes in ownership and use. Utility realignment works may also require easements on private properties and within municipal lands and rights of way. Where properties will be fully acquired, access by previous owners will not be permitted.

Residential, institutional, and commercial properties close to the Project Footprint may experience nuisance effects from construction activities such as construction noise and vibration. Fugitive dust within the context of socio-economic and land use may also be a nuisance effect but is expected to be low and short term in duration as its limited to construction activities. Further information on changes to Air Quality (AQ) and noise and vibration from the Project is available in Sections 5.5 and 5.6, respectively. There may be a loss of privacy due to the increased number of workers and traffic in the vicinity of the Project Footprint and increased lighting required for construction activities. Construction zones have the potential to obstruct sight lines to properties resulting in security concerns. Erosion and sediment may be released onto neighbouring properties and adjacent roadways during construction activities. These nuisance effects are expected to be short term during the Project's construction.

Operations

After construction of the Project is completed, temporary easements and temporary property acquisitions will no longer be required, and the land will be returned to its original use. No new property acquisitions or easements will be required during operations.

The existing rail corridor is well-established. Operational effects of GO trains such as noise, vibration, and dust may increase the duration or magnitude of these effects, however no new effects are anticipated for the rail corridor.

5.7.1.2 GO Station Locations

Construction

Metrolinx currently owns the four proposed GO station locations, with the exception of the southern lot within the Courtice Road (B3 Courtice) GO Station. The four GO stations will be pursued through Metrolinx's Transit Oriented Community (TOC) Program. Third parties will be required to follow the established municipal planning approvals process for each location.

Residential, institutional, and commercial properties close to the Project Footprint may experience nuisance effects from construction activities as identified in Section 5.7.1.1.

Operations

Discussions with relevant municipalities regarding land use changes will be undertaken prior to construction. No further consultation would be required during operations. No further amendments would be required during operations. Once construction has been completed and services are in place, the Project will have long-term benefits to the Study Area through improved access to public transit.

Four new GO stations are proposed which have the potential to result in increased nuisance effects, including noise, vibration, dust, light and traffic. Discussions with relevant municipalities regarding land use changes will be undertaken prior to construction. No further consultation would be required during operations.

5.7.1.3 Bridges

Construction

The proposed removal of the Albert Street bridge will require additional coordination with the Regional Municipality of Durham and the City of Oshawa during detailed design. There may be property impacts to accommodate dead ends at the termination of each road segment, if required. During construction, Albert Street will be barricaded at each road terminus section until the permanent civil construction works are completed and the road closure is finalized.

Changes in access across the rail corridor will be temporarily modified during construction of the bridges, overpasses, and multi-use crossings. Traffic (including vehicular, pedestrian and cyclists) will be rerouted along alternative existing routes. This will result in inconvenience and additional travel time and distance. Final construction sequencing will be determined during detailed design and is subject to change.

Construction of new tracks at the DC Oshawa GO will require an extension to the existing pedestrian bridge so that pedestrians can access the tracks. During construction activities, passengers may be temporarily inconvenienced as parking facilities are reduced, site access is temporarily altered or relocated, and pedestrian access to the DC Oshawa GO platform and other GO station facilities are altered. As a result, some delays may occur, and lineups may be longer than usual for short periods of time.

Residential, institutional, and commercial properties close to the Project Footprint may experience nuisance effects from construction activities as identified in Section 5.7.1.1.

Operations

There may be property impacts to accommodate road terminus segments such as dead ends or embarkments in the vicinity of Albert Street. Removal of the Albert Street bridge will also remove the ability for vehicular, pedestrian, and cyclist traffic to pass across the rail corridor at this location. This will result in adjustments to travel pathways and may result in additional travel time for certain destinations.

Detours required during the construction of the bridges will no longer be required during operations and traffic (i.e., vehicular, pedestrian, and cyclist) can return to existing routes. Structural work will, at a minimum, maintain existing configurations and service levels, and are not anticipated to substantially alter use during operation.

The Project includes an extended pedestrian bridge at DC Oshawa GO and a multi-use bridge at Farewell Street to allow pedestrians and cyclists to cross the rail corridor. Crossings are currently available in these locations and new structures will have a similar form/function to existing multi-use bridges and no change in access is anticipated. Similar to the existing multi-use bridges, there may have opportunities for entrapment or concealment along the crossing structure and associated ramps. There may be a lack of sightlines when traversing the ramps and crossing structure due to corners and the concrete structure of the ramps and bridge. Other safety concerns, including potential for materials to be thrown off of the ramp of a multi-use bridge (if selected), will be addressed during detailed design.

A multi-use crossing will be constructed at the Michael Starr Trail to replace the existing at-grade crossing. Although there is an existing at-grade, signalized multi-use crossing at this location, the crossing is being adjusted to meet the access and safety requirements for the new service levels. The multi-use crossing may have a risk of entrapment or isolation. There may be opportunities for concealment within the ramps or crossing corridor. If a tunnel crossing is implemented, visibility of the tunnel may be limited from the street and sightlines from associated ramps into the tunnel may be limited. If a bridge crossing is implemented, effects will be similar to the potential effects described at Farewell Street. Once a crossing type has been finalized additional safety measures will be addressed during detailed design.

5.7.2 Built Form and Visual Characteristics

This section describes the potential effects to the built form and visual characteristics of the Socio-Economic and Land Use Assessment Area resulting from the physical works associated with Project construction and infrastructure in operations. Built form relates to the character, function, orientation, configuration and heights of buildings, in consideration of their orientation to open spaces and streets. The qualitative assessment considers anticipated changes to the local built form and viewshed.

5.7.2.1 Linear Facilities

Construction

Temporary effects to built form and visual characteristics may be experienced as a result of construction of infrastructure. Construction activities may result in increased lighting in construction sites during night activities and removal of vegetation to accommodate construction access and equipment operation. Visual effects related to the temporary storage of construction equipment, materials, hoarding, stockpiling of materials, and construction zone are anticipated. The effects would be temporary and limited to the construction phase of the Project.

Operations

Following the completion of construction, equipment and temporary storage areas would be removed/rehabilitated and there would be no further visual effects during operations.

The new tracks will be placed adjacent to the existing CP Rail tracks within the rail corridor. The horizontal expansion of the tracks will maintain a similar view as the existing rail corridor at ground level and will not result in a substantial sightline change from a distance.

Retaining walls will be used at several locations along the rail corridor to provide track protection and address differences in grading. The new retaining walls will be more visually prominent to nearby land uses as they will result in increased grades affecting sightlines and/or will replace the current existing vegetation.

5.7.2.2 GO Station Locations

Construction

Potential effects resulting from construction activities at the GO station locations would be the same as those identified under linear facilities (refer to Section 5.7.2.1).

Operations

Following the completion of construction, equipment and temporary storage areas would be removed/rehabilitated and there would be no further visual effects in operations.

Four new GO station locations will be constructed along the rail corridor. Fox Street (B1 Thornton's Corners East) will be constructed adjacent to a power centre and surrounding residential and industrial and uses. Front Street (B2 Ritson) will be constructed on the site of the former Ontario Malleable Iron Company and Knob Hill Farms. The new GO station will be constructed adjacent to commercial, light industrial, institutional, and residential land uses. If multi-story buildings are constructed as a part of the GO station, the site may be more visually prominent than the existing buildings when viewed from nearby properties. Courtice Road (B3 Courtice) will be constructed adjacent to industrial and agricultural land uses at an existing GO bus stop location. The new GO station will be more visually prominent than the existing site from surrounding land uses. Bowmanville Avenue (B4 Bowmanville) will be constructed adjacent to a multi-storey condominium complex and surrounding residential and commercial land uses. The new GO station may be more visually prominent than existing conditions when viewed from surrounding land uses.

There is the potential for visual effects related to lighting during operations. Lighting for GO stations will be designed in accordance with applicable guidelines and standards.

5.7.2.3 Bridges

Construction

Potential effects resulting from construction activities at the GO station location would be the same as those identified under linear facilities (refer to Section 5.7.2.1).

Operations

Table 5.2 provides a summary of the visual effects of the bridges subject to this TPAP (refer to Section 1.3.2) along the rail corridor during operations.

As required and in accordance with applicable standards, lighting for applicable bridges will be required to improve visibility for traffic, pedestrians and cyclists. At a number of locations, infrastructure is proposed to be reconstructed and potential effects from lighting will not differ substantially from existing conditions.

Table 5.2: Summary of Visual Effects from Bridge/ Tunnel Infrastructure Along the Rail Corridor

Location	Existing Infrastructure	Description of Proposed Infrastructure	Visual Effects
DC Oshawa GO	Pedestrian bridge	Pedestrian bridge extension to access the Via Rail Canada Inc. (VIA) platform	The new enclosed bridge over the new GO track will be similar to the existing bridge. No change to the existing view from surrounding land uses.
Highway 401	Rail bridge	New bridge to be located to the east of the existing bridge	A similar rail bridge structure over Highway 401 already exists and the new bridge will be adjacent to the existing bridge. A substantial amount of infrastructure already exists in the area and the addition of the bridge will not change the character of the view from surrounding land uses.
General Motors (GM) Spur	Rail tracks are present; no bridge infrastructure	The new GO Track will pass over the realigned GM Spur track	A new bridge will be visual on the landscape, within the context of an industrialize/commercial area.
Stevenson Road Bridge	Road overpass which accommodates two CP Rail tracks.	Existing bridge expanded southward to accommodate proposed GO track	The expanded overpass will have a similar profile to the existing when viewed from a distance. No change to the existing view from surrounding land uses.

Location	Existing Infrastructure	Description of Proposed Infrastructure	Visual Effects
Park Road Bridge	Road overpass which accommodates two CP Rail tracks.	Existing bridge expanded southward to accommodate proposed GO track	The expanded overpass will have a similar profile to the existing when viewed from a distance. No change to the existing view from surrounding land uses.
Simcoe Street Bridge	Road overpass which accommodates one CP Rail track.	Reconstruct road overpass	The expanded overpass will have a similar profile to the existing when viewed from a distance. No change to the existing view from surrounding land uses.
Albert Street Bridge	Road overpass which accommodates one CP Rail track.	Bridge removal	The removal of the existing bridge will change the existing view from surrounding land uses. New infrastructure will include a retaining wall on the south side of the rail corridor and barricades at the terminus of Albert Street, both north and south of the rail corridor.
Michael Starr Trail	At-grade multi-use crossing	New multi-use crossing	Retaining walls may be required for a tunnel, which would change the view from land uses directly surrounding Michael Starr Trail. From a distance, the replacement of the at-grade crossing with a tunnel would be a negligible change to the viewshed. A new bridge would be more visually prominent than the existing multi-use crossing when viewed from surrounding land uses.
Ritson Road Bridge	Road overpass which accommodates one CP Rail track.	Remove existing and reconstruct road overpass	The expanded overpass will have a similar profile to the existing when viewed from a distance. No change to the existing view from surrounding land uses.

Location	Existing Infrastructure	Description of Proposed Infrastructure	Visual Effects
Wilson Road Bridge	Single track bridge	New double track bridge	The new bridge will have a similar profile when viewed from a distance. No change to the existing view from surrounding land uses.
Farewell Street Multi-Use Bridge	Multi-use crossing	Reconstruct multi-use bridge	A new multi-use bridge will resemble the existing multi-use bridge in this location. No change to the existing view from surrounding land uses.
Harmony Road Bridge	Road overpass which accommodates one CP Rail track.	Existing bridge expanded southward to accommodate proposed GO tracks	The expanded overpass will have a similar profile to the existing when viewed from a distance. No change to the existing view from surrounding land uses.
Harmony Creek Bridge	Double track bridge	New double track bridge	The new bridge will have a wider span than the existing bridge, however the profile will be similar when viewed from a distance. No change to the existing view from surrounding land uses.
Farewell Creek Bridge	Single track bridge	New double track bridge	The new bridge will have a wider span than the existing bridge, however the profile will be similar when viewed from a distance. No change to the existing view from surrounding land uses.
Courtice Road Bridge	Road overpass which accommodates two CP Rail tracks.	Existing bridge expanded southward to accommodate proposed GO track	The expanded overpass will have a similar profile to the existing when viewed from a distance. No change to the existing view from surrounding land uses.
Green Road Bridge	Single track bridge	New single-track bridge	The new bridge will have a similar profile when viewed from a distance. No change to the existing view from surrounding land uses.

5.7.3 Utilities

This section describes the potential conflicts with utilities resulting from the physical works associated with Project construction and the potential for ongoing maintenance requirements during operations.

5.7.3.1 Linear Facilities

Construction

Project construction will result in effects to utilities through physical works and construction activities within the Socio-Economic and Land Use Assessment Area.

Utilities that may need to be relocated due to the Project include communication cables, fibre optic cables, gas, hydro, sewer lines, and watermains.

Properties located within the Socio-Economic and Land Use Assessment Area may experience temporary service interruptions during utility realignment/relocation. Realignment work may result in the need for temporary road or lane closures changing access to nearby properties, and could temporarily affect pedestrian, cyclist and vehicle movement. In addition, construction or relocation of utilities and retaining walls may impact additional trees and vegetation on top of or adjacent to construction work.

Temporary and/or permanent easements may be required to facilitate the realignment of utilities, resulting in property impacts.

Further investigations may identify additional specific utility conflicts as design advances. Approaches to relocate or avoid impacts to these utilities will be refined with utility owners as detailed design progresses.

Operations

No negative effects to utilities are anticipated during the operations phase of the Project because utilities will be reinstated or relocated to maintain existing function. No changes to current maintenance activities are anticipated.

5.7.3.2 GO Station Locations

Construction

Should any utilities be affected during construction of the GO station locations, the effects would be as those described under Section 5.7.3.1.

Operations

New connections to existing utilities will be required to facilitate the GO station locations. Metrolinx will engage with the relevant utility owners/operations to confirm ongoing operational and maintenance requirements. Overall, no negative effects to utilities are anticipated during operations because utilities will be installed to maintain existing function.

5.7.3.3 Bridges

Construction

Should any utilities be affected during construction of bridges, the effects would be as those described under Section 5.7.3.1.

Operations

As per Section 5.7.3.1, no negative effects to utilities are anticipated during the operations phase of the Project.

5.7.4 Source Water Protection

This section describes potential interactions that Project activities during construction or operations could have on source water protection resources (i.e., drinking water sources).

5.7.4.1 Linear Facilities

Construction

There is a potential for spills or releases from machinery and equipment during construction activities. Such releases have potential to affect groundwater or surface water quality. While there is potential for such interactions to occur, accidental releases would be localized in nature.

Operations

There is a potential for spills or releases from machinery and equipment during operations and maintenance activities. Such releases have potential to affect groundwater or surface water quality. While there is potential for such interactions to occur, accidental releases would be localized in nature. No fuel transport is proposed as part of the Project and as such there is no potential effect to highly vulnerable aquifers areas (HVAs) from linear facilities.

5.7.4.2 GO Station Locations

Construction

As noted under Section 5.7.4.1 above, there is a potential for spills or releases from machinery and equipment during construction, however accidental releases would be localized in nature.

Operations

As noted under Section 5.7.4.1 above, there is a potential for spills or releases from machinery and equipment during operations and maintenance activities, however accidental releases would be localized in nature.

A refueling station may be located at the Bowmanville Avenue (B4 Bowmanville) GO station, which is located within an HVA. The fueling station will be equipped with measures to prevent the accidental release of fuel to the surrounding environment. No other fuel storage is proposed at the remaining three GO stations.

HVAs are susceptible to contamination from road salt application, handling and storage of road salt and snow storage, activities which may occur at the GO stations. As such, there is a potential effect to HVAs from road salt contamination.

An Event Based Area (EBA) was identified at the proposed Fox Street (B1 Thornton's Corners East) GO Station and the segment of track corridor that runs towards, and crosses, Oshawa Creek. However, this EBA was identified due to the potential for pipeline fuel/oil spills into Oshawa Creek that has potential to contaminate water intakes in Lake Ontario (near the mouth of Oshawa Creek); the Project does not include a pipeline nor is oil being transported and as such there will be no effects to this EBA.

5.7.4.3 Bridges

Construction

As noted under Section 5.7.4.1 above, there is a potential for spills or releases from machinery and equipment during construction, however accidental releases would be localized in nature.

Operations

As noted under Section 5.7.4.1 above, there is a potential for spills or releases from machinery and equipment during operations and maintenance, however accidental releases would be localized in nature.

Bridges associated with road overpasses would be maintained by the relevant municipality and no change from existing conditions would be expected.

5.8 Traffic and Transportation

Project construction activities may result in changes to traffic and transportation through access changes resulting in increased travel time, detours and lane restrictions.

5.8.1 Road Network

5.8.1.1 Linear Facilities

Construction

Construction activities for linear facilities will occur within the right-of-way (ROW) for the CP Rail corridor and will not affect roadways. No effects on the road network are anticipated.

Operations

It is not anticipated that the road network will be affected by operations as a result of linear facilities. Grade separated crossings will maintain separation between the road network and the rail corridor.

5.8.1.2 GO Station Locations

Construction

Design plans for the GO stations are currently in progress and a limited amount of information regarding the facilities is currently available. Based on a high-level qualitative assessment, it is not anticipated that the road network will be affected by construction, as minor traffic disruptions from construction vehicle access is not anticipated to affect road capacity. Construction activities are not anticipated to require roadway closures or significant traffic disruptions. Construction activities may require temporary, non-peak period lane reductions where needed.

Operations

Focus Area B1: Fox Street (B1 Thornton's Corners East GO Station)

Under existing conditions, a number of intersections along Stevenson Road South are currently operating at or close to capacity. Indicating that additional improvements, particularly around the Highway 401 Interchanges, may be required to support further development growth.

It is anticipated that under Future 2031 Conditions, a number of intersections will operate at or close to theoretical capacity (i.e., volume to capacity [v/c] > 1.00). These include intersections along Thickson Road South and Burns Street East, Thickson Road South, and Stevenson Road South and Thickson Road South and Highway 401 South Ramp. This indicates that additional roadway capacity may be warranted on this corridor to support future development growth.

Regional Municipality of Durham has proposed the extension of Stellar Drive from Thornton Road to Laval Drive. However, some of these are anticipated project timelines, and the timing for the Stellar Drive to Laval Drive Extension will likely be beyond the 2031 horizon and will need to be further assessed beyond the scope of this study.

Focus Area B2: Front Street (B2 Ritson) GO Station

Under existing conditions, intersections within this Focus Area are operating acceptably during the AM and PM peak periods.

Under Future 2031 Conditions, a number of roadway infrastructure improvements are anticipated to be in place. These include Highway 401 Interchange improvements, the realignment and widening of Olive Avenue to Gibb Street, the Bloor Street realignment and widening east of Farewell Street, and the two-way conversion of Albert Street and Court Street north of Olive Street. In addition, the Albert Street Bridge over the CP Rail corridor was assumed to be removed.

Under Future 2031 Conditions, a number of intersections are projected to operate at or close to theoretical capacity (i.e., v/c > 1.00) which could potentially result in congestion and traffic delays. These include the intersections of Olive Avenue / Ritson Road South, Olive Avenue / Harmony Road, First Avenue / Simcoe Street, Tennyson Avenue / Harmony Road, Bloor Street / Harmony Road, and Bloor Street / Grandview Street.

Focus Area B3: Courtice Road (B3 Courtice)

Under existing conditions, intersections within this Focus Area are operating acceptably during the AM and PM peak periods.

Under Future 2031 Conditions, a number of roadway improvements are assumed to be in place to support planned development growth in the vicinity of the future station near Courtice Road. These improvements include the assumed extension of Townline Road towards Prestonvale Road, Trulls Road, and Courtice Road. In addition, Courtice Road is assumed to be widened to a four-lane cross section between Bloor Street and the Highway 401 interchanges. Other improvements include the implementation of traffic control signals and auxiliary turn lanes at Focus Area intersections. It is assumed that

the Townline Road extension and other localized intersection improvements will be in place to support development growth.

Under Future 2031 Conditions, intersections around Focus Area B3 are anticipated to operate slightly above the critical threshold during the AM peak period, with the intersection of Bloor Street and Trulls Road anticipated to operate at or close to theoretical capacity (i.e., v/c >1.00) in the PM peak period.

Focus Area B4: Bowmanville Avenue (B4 Bowmanville)

Under Existing Conditions, intersections within Focus Area B4 are currently operating with acceptable levels of service with the exception of the Bowmanville Avenue / Energy Drive intersection during the PM peak period.

The intersection of Bowmanville Avenue / Energy Drive, which is currently operating as a stop-controlled intersection at the minor approach, is currently operating at or close to capacity during the PM peak period.

Under Future 2031 Conditions, a number of roadway improvements are assumed to be in place to support planned development growth in the vicinity of the future GO station near Bowmanville Avenue. These improvements include roadway widening of Bowmanville Avenue to a four-lane cross section between Highway 2 and the north Highway 401interchange (east-north/south), this assumes that the existing bridge over Highway 401 is in place.

Under Future 2031 Conditions, intersections around Focus Area B4 are anticipated to operate acceptably with the exception of the Highway 401 interchanges and the intersection of Highway 2 / Bowmanville Avenue and Bowmanville Avenue / Baseline Road West. It is anticipated that the widening of Bowmanville Avenue to the Highway 401 interchanges is needed. In addition, the localized widening and addition of auxiliary turn lanes at the intersection of Highway 2 / Bowmanville Avenue is anticipated to be required by the Future 2031 horizon.

5.8.1.3 Bridges

Construction

Temporary impacts to road users will occur during construction of the bridges. Construction activities will result in full road closures at Simcoe Street, Ritson Road, Stevenson Road, Park Road, Harmony Road, and Courtice Road which will affect traffic and travel times.

The TIA evaluates two locations, Simcoe Street and Ritson Road, where road closures were identified during preliminary design development in order to facilitate construction staging. Additional road closures at Stevenson Road, Park Road, Harmony Road, and Courtice Road were identified as design development progressed and will be analyzed, as required, as part of the development of Traffic Control and Management Plans prior to construction.

Under the Simcoe Street closure scenario, traffic currently using the roadway will need to be redirected. Based on the traffic count data collected, there are approximately a total of 900 – 990 vehicles per hour traveling in the north-south direction during the AM and PM peak hour. The following traffic diversion assumptions were made for impacted traffic on Simcoe Street:

- 25% of impacted Simcoe Street traffic is diverted to Park Road
- 25% of impacted Simcoe Street traffic is diverted to Ritson Road
- 20% of impacted Simcoe Street traffic is diverted to Albert Street[22]
- 15% of impacted Simcoe Street traffic is diverted to Stevenson Road
- 15% of traffic is assumed to seek other alternate roads, shift travel time or mode

Five intersections were identified with critical intersection movements operating at volume to capacity (v/c) ratios of 0.90 or higher, and (Level of Service) LOS E[23] or more, including: Olive Street / Ritson Road South; Bloor Street West / Highway 401 eastbound ramp; Bloor Street East / Simcoe Street South; and Drew Street / Bloor Street / Highway 401 ramp.

Under the Ritson Road closure scenario, traffic currently using the roadway will need to be redirected. Based on the traffic count data collected, there are approximately a total of 2,000 vehicles per hour traveling in the north-south direction during the AM and PM peak hour. The following traffic diversion assumptions were made for impacted traffic on Ritson Road:

- 40% of impacted Ritson Road traffic is diverted to Simcoe Street
- 15% of impacted Ritson Road traffic is diverted to Wilson Street
- 10% of impacted Ritson Road traffic is diverted to Park Road
- 10% of impacted Ritson Road traffic is diverted to Albert Street[22]

[22] The existing bridge over the rail corridor will be removed at Albert Street, resulting in a permanent impact to the road network. The impact of Albert Street Bridge closure on Simcoe Street and Ritson Road closures and detours will be further studied through development of the Traffic Control and Management Plans.
[23] Refer to Table 3.4 for LOS definitions.

- 10% of impacted Ritson Road traffic is diverted to Harmony Road
- 15% of traffic is assumed to seek other alternate roads, shift travel time or mode

Eight intersections were identified with critical intersection movements operating at v/c ratios of 0.90 or higher, and LOS E or more, including: Olive Avenue / Simcoe Street; Olive Street / Ritson Road South; Tennyson Avenue and Harmony Road; Simcoe Street / Highway 401 westbound ramp; Bloor Street West / Highway 401 eastbound ramp (Simcoe Interchange); Bloor Street East / Simcoe Street South; Bloor Street / Farewell Street/ Highway 401 ramp; and Bloor Street / Harmony Road.

Furthermore, there is the potential for safety concerns based on additional hazards as a result of visual distractions associated with detours and lane restrictions required for construction, which may lead to an increase in traffic delays and possible traffic accidents.

The existing bridge over the rail corridor will be removed at Albert Street, resulting in a permanent impact to the road network. Vehicular traffic will be required to use an alternative route over the rail corridor.

Operations

Once bridge construction is completed, roadways will be returned to existing conditions and no effects are anticipated, with the exception of Albert Street. The removal of the existing bridge at Albert Street will result in some impact to vehicular and cyclist traffic as vehicles and cyclists will no longer be able to cross the rail corridor at Albert Street.

5.8.2 Transit Network

5.8.2.1 Linear Facilities

Construction

Construction activities for linear facilities will occur within the ROW for the CP Rail corridor and will not affect roadways. Therefore, it is not anticipated that the transit network will be affected by linear facilities construction activities.

Operations

It is not anticipated that bus routes will be affected by operations as a result of linear facilities. Grade separated crossings will maintain separation between the road network and the rail corridor.

Once construction is complete, positive effects are anticipated related to GO train service improvements (i.e., new track, more trains, better service levels).

5.8.2.2 GO Station Locations

Construction

Design plans for the GO stations are currently in progress and a limited amount of information regarding the facilities is currently available. Based on a high-level qualitative assessment, it is not anticipated that the existing bus routes will be affected by construction, as minor traffic disruptions from construction vehicle access are not anticipated to affect the road network capacity.

Operations

As per Section 5.8.1.2, roadways within Focus Areas B1, B2, and B4 may experience reduced levels of service under the Future 2031 Conditions, which could result in delays to bus routes. Under Future 2031 Conditions, intersections around Focus Area B3 are anticipated to operate acceptably and no effects to the road network are anticipated.

Once construction is complete, positive effects are anticipated as the Project will serve to expand and improve the transit network, including new GO station locations to offer increased opportunities for GO Train riders to access the GO network and the potential for expanded bus service to/from the GO stations.

5.8.2.3 Bridges

Construction

As noted above in Section 5.8.1.3, the focus of the TIA was to evaluate Simcoe Street and Ritson Road, where the most substantial effects to roadways are anticipated due to road closure during construction. In addition, construction activities will result in full road closures at Stevenson Road, Park Road, Harmony Road, and Courtice Road which will be analyzed, as required, as part of the development of Traffic Control and Management Plans prior to construction.

Due to the closure of the Simcoe Street, Ritson Road, Stevenson Road, Park Road, Harmony Road and Courtice Road bridges for construction, Durham Region Transit (DRT) routes may be impacted due to rerouting or traffic delays resulting in longer commute times. Road closure is not currently planned at any other bridge crossings, although this will be confirmed through detailed design.

At Simcoe Street, the 901B DRT bus route will need to be rerouted to Park Road and Ritson Road which is the adjacent north-south roadway. Other DRT bus routes that could potentially be impacted from the Simcoe Street bridge closure include: Route 410 with service on Gibb Street, Elm Avenue, and Olive Avenue; Route 407A with service

on Ritson Road South, Wilson Road South and Dean Avenue; and Route 403 and 411 with service on Park Road South.

At Ritson Road, DRT route 407 will need to be rerouted to First Avenue and Olive Avenue via Simcoe Street. Other potential DRT bus routes that could potentially be impacted from the Ritson Road bridge closure include: Route 410 with service on Gibb Street, Elm Avenue, and Olive Avenue; Route 403 and 411 with service on Park Road South; Route 411 with service on Bloor Street East between Park Road South and Ritson Road South; and Route 901B with service on Gibb Street, Centre Street South, and Simcoe Street South.

At Stevenson Road, Routes 902A and 917 will be impacted during the temporary closure of the bridge, as will Routes 403 and 411 at Park Road. GO Bus route 88 will be impacted during the temporary closure of the Courtice Road bridge. Appropriate re-routing for these bus routes will be confirmed prior to construction as part of the development of Traffic Control and Management Plans.

In general, construction of the bridges may result in increased travel time for transit users as buses navigate lane closures or other temporary interruptions associated with construction.

The existing bridge over the rail corridor will be removed at Albert Street. There are currently no DRT bus routes that use the Albert Street bridge and therefore the impact of the bridge removal will be negligible to the transit network.

Operations

Once construction of the bridges is complete, roadways will be returned to existing conditions and no effects to the transit network are anticipated. There is currently no bus route on Albert Street and therefore the removal of the bridge will not affect the transit network.

5.8.3 Cycling, Pedestrian and Trail Network

5.8.3.1 Linear Facilities

Construction

Construction activities for linear facilities will occur within the ROW for the CP Rail corridor and will not affect roadways, sidewalks or other trails. Therefore, it is not anticipated that the cycling, pedestrian and trail network will be affected by linear facilities construction activities.

Operations

It is not anticipated that the cycling, pedestrian and trail network will be affected by operations as a result of linear facilities. Grade separated crossings will maintain separation between the existing networks and the rail corridor.

5.8.3.2 GO Station Locations

Construction

Design plans for the GO stations are currently in progress and a limited amount of information regarding the facilities is currently available. Based on a high-level qualitative assessment, it is not anticipated that the existing cycling, pedestrian and trail network will be affected by construction, as minor traffic disruptions from construction vehicle access are not anticipated to affect the capacity of existing networks.

Operations

It is anticipated that cyclists and pedestrians will not be affected by the GO stations during operations as the GO stations will be designed to accommodate existing networks.

5.8.3.3 Bridges

Construction

As noted above in Section 5.8.1.3, the focus of the TIA was to evaluate Simcoe Street and Ritson Road, where the most substantial effects to cyclists and pedestrians are anticipated due to road closure during construction. Full road closures are anticipated at Stevenson Road, Park Road, Harmony Road and Courtice Road, however these roadways were not explicitly assessed within the TIA; a qualitative assessment is provided below.

In relation to the Simcoe Street, the existing sidewalks on either side of the road will be closed during construction activities. An existing cycling facility along the Joseph Kolodzie Oshawa Creek Bike Path connects to Simcoe Street (Regional Municipality of Durham 2021b). This loop is mostly along the Joseph Kolodzie Oshawa Creek Bike Path with connections to reach Simcoe Street. While the accessibility to some portions of Simcoe Street may be limited, there will be no other impact to the existing cycling facility due to the road closure. Pedestrians and cyclists will need to be rerouted east via Michael Starr Trail to cross the CP rail corridor to divert back onto Simcoe Street. Another option is to use the Joseph Kolodzie Oshawa Creek Bike Path on the west via Mill Street further north to Gibb Street to get back onto Simcoe Street. Detours would result in increased travel time and greater exposure to weather elements.

As with Simcoe Street, the existing sidewalks on either side of Ritson Road will be closed during construction activities. During construction, active transportation users will experience temporary inconvenience and additional travel time and distance to cross the rail corridor during the Ritson Road closure as there are no other crossings in proximity to Ritson Road.

There are no cycling facilities along Ritson Road currently. According to the City of Oshawa's Active Transportation Master Plan Technical Report (2015) there is no plan to provide cycling and trail network along Ritson Road in the vicinity of the proposed road closure. The Active Transportation Master Plan identifies cycling improvements in the adjacent road network. These improvements include:

- cycling facilities along Olive Avenue where bicycle lanes are proposed east of Ritson Road
- a multi-use trail proposed west of Ritson Road
- bicycle lanes along Wilson Road and Dean Avenue

The proposed Ritson Road closure will have no impact on these future facilities. No pedestrian facilities are proposed in the vicinity of Ritson Road and the rail corridor.

Stevenson Road, Harmony Road and Park Road will require temporary closures of sidewalks on both sides of the roadway during construction and active transportation users will experience temporary inconvenience and additional travel time and distance to cross the rail corridor.

There is an existing off-road cycling trail north of the rail corridor at Stevenson Road, running parallel to the rail corridor, which connects into a proposed off-road corridor leading to Park Road and further east (City of Oshawa 2015). This route could potentially be used as a detour for cyclists. At Harmony Road, there are no existing or proposed cycling facilities.

There are no sidewalks or cycling facilities along Courtice Road, however any active transportation users on this roadway will experience temporary inconvenience and additional travel time and distance to cross the rail corridor.

The existing bridge over the rail corridor at Albert Street will be removed, resulting in an impact to cyclists and pedestrians as there will be no access across the rail corridor at Albert Street. Active transportation users may experience additional travel time and distance as an alternative route will be necessary.

Construction of the multi-use crossings at Front Street (Michael Starr Trail) and the pedestrian bridge at the DC Oshawa GO, may result in the temporary closure of the existing crossings to pedestrians and cyclists. Additional travel time would be required

detour around these crossings, thereby exposing pedestrians and cyclists to weather elements.

Full closure of cycling, pedestrian or trail networks is not currently planned at any other bridge crossings, although this will be confirmed through detailed design. Temporary partial closures may be required.

Operations

It is not anticipated that the cycling, pedestrian and trail network will be affected by operations as a result of bridges. Cycling lanes, sidewalks, and trail connections will be reconstructed to align with existing conditions, with the exception of Albert Street. The closure of the bridge at Albert Street will result in a permanent impact to cyclists and pedestrians as there will no longer be access across the rail corridor at Albert Street.

The Project includes an extended pedestrian bridge at DC Oshawa GO to allow pedestrians to cross the rail corridor. A crossing is currently available in this location and the new structure will have a similar form/function to existing bridge and no change in access is anticipated. Similar to the existing bridge, there may be opportunities for entrapment or concealment along the crossing structure and associated ramps. There may be a lack of sightlines when traversing the ramps and crossing structure due to corners and the concrete structure of the ramps and bridge. Other safety concerns, including potential for materials to be thrown off of the ramp of a multi-use bridge (if selected), will be addressed during detailed design.

A multi-use crossing will be constructed at the Michael Starr Trail to replace the existing at-grade crossing. Although there is an existing at-grade, signalized multi-use crossing at this location, the crossing is being adjusted to meet the access and safety requirements for the new service levels resulting in a positive effect as pedestrian and cyclist movements at the rail crossing can free-flow instead of having trains pass periodically through the current at-grade crossing.

The multi-use crossing may have a risk of entrapment or isolation. There may be opportunities for concealment within the ramps or crossing corridor. If a tunnel crossing is implemented, visibility of the tunnel may be limited from the street and sightlines from associated ramps into the tunnel may be limited. If a bridge crossing is implemented, effects will be similar to the potential effects described above for the DC Oshawa GO pedestrian bridge. Once a crossing type has been finalized additional safety measures will be addressed during detailed design.

5.9 Cultural Environment

There is the potential for direct and indirect impacts to Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL). Additionally, areas within the Project Footprint are identified for further archaeological assessment to determine potential effects to archaeological resources.

Potential effects to the cultural environment are described below, while corresponding mitigation measures and monitoring activities relating to the cultural environment are described in Section 5.10.

5.9.1 Built Heritage Resources and Cultural Heritage Landscapes

Where a BHR or CHL was identified within or across the Cultural Heritage Assessment Area, an assessment of potential impacts as a result of the Project was undertaken. Impacts to heritage resources may be direct (e.g., property impacts, bridge removal, alteration/demolition) or indirect (e.g., vibration).

As per Section 3.9.1.2, construction vibration ZOIs were established relative to the Project Footprint to identify potential areas impacted by construction vibration and minimum setback distances required for the most impactful construction equipment for vibration compliance. A total of 17 cultural heritage resources are located within a ZOI (refer to Figure 11 in Appendix A7-1.).

Table 5.3 provides an overview of the identified BHRs and CHLs and a brief description of the anticipated Project impacts based on the preliminary design. The table also describes the mitigation measures and recommendations included in the Cultural Heritage Report (CHR): Existing Conditions and Preliminary Impact Assessment (Appendix A7-1).

Table 5.3: Preliminary Impact Assessment and Mitigation Measures

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-1	CPR Bridge over CN Tracks, Oshawa	Identified During Field Review	**Indirect Impacts Anticipated:** The bridge is situated within the project ZOI. Construction activities are proposed north of the bridge within 11 metres of the identified BHR. The position of the structure within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	Where construction activities are anticipated within the buffer zone, a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.
BHR-2	555 Thornton Road South, Oshawa	Previously identified by Stantec in 2018 in the Bowmanville Corridor Expansion CHSR	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 147 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-3	99 Thornton Road South, Oshawa	Previously identified by Stantec in 2018 in the Bowmanville Corridor Expansion CHSR	**No Impacts Anticipated:** The property is located within the Cultural Heritage Study Assessment. Construction activities are proposed more than approximately 276 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-4	254 Hibbert Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 23 metres northwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-5	22 Royal Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 114 metres southeast of the residence. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-6	83 Avenue Street, Oshawa	Class A Listed Property on the Municipal Heritage Register	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses.	The property at 83 Avenue Street is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC made an interim decision that 83 Avenue Street is not a PHP or PHPPS.

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-7	50 Avenue Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed approximately 31 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-8	33 Avenue Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	**Indirect Impacts Anticipated:** The property is situated within the project ZOI. Construction activities are proposed approximately 8 metres southwest of the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	Where construction activities are anticipated within the buffer zone, a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.
BHR-9	75 Hall Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed approximately 15 metres north of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-10	71 Hall Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed approximately 15 metres north of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-11	15 Hall Street, Oshawa	Identified during field review	**Indirect Impacts Anticipated:** The property is situated within the Project ZOI. Construction activities are proposed approximately 9 metres northeast of the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	Where construction activities are anticipated within the buffer zone, a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.
BHR-12	346 Simcoe Street South, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 106 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-13	356 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 72 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-14	364 Simcoe Street South, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 52 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-15	370 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 33 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-16	394 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses. **Indirect Impacts Anticipated:** The property is situated within the Project ZOI. Construction activities are proposed approximately 2 metres east of the building. The position of the building within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities.	The property at 394 Simcoe Street is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC made an interim decision that 394 Simcoe Street South is not a PHP or PHPPS.
BHR-17	442 Simcoe Street South, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 25 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-18	486 Simcoe Street South, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 148 metres north of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-19	505 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 155 metres northwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-20	491 Simcoe Street South, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 173 metres northwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-21	471 Simcoe Street South, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 90 metres north of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-22	399 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses. **Indirect Impacts Anticipated:** The property is situated within the Project ZOI. Construction activities are proposed adjacent to the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities.	The property at 399 Simcoe Street is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC made an interim decision that 399 Simcoe Street South is not a PHP or PHPPS.
BHR-23	373 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the cultural Heritage Assessment Area. Construction activities are proposed approximately 25 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-24	357 Simcoe Street South, Oshawa	Class A Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 63 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-25	335-339 Simcoe Street South, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 142 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-26	325 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 175 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-27	291 Simcoe Street South, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 274 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-28	7 Maple Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 193 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-29	11 Maple Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 195 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-30	13 Maple Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 180 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-31	15 Maple Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 182 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-32	21 Maple Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 200 metres southwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-33	296 Celina Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 223 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-34	298 Celina Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 214 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-35	302 Celina Street, Oshawa	Identifies during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 205 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-36	304 Celina Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 197 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-37	326 Celina Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 128 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-38	301 Celina Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 193 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-39	19 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 96 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-40	25 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 87 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-41	29 Olive Avenue Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 73 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-42	33 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 41 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-43	348 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 41 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-44	64 Albany Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed approximately 26 metres west of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-45	45 Albany Street, Oshawa	Identified during field review	**Indirect Impacts Anticipated:** The property is situated within the Project ZOI. Construction activities are proposed approximately 3 metres north of the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	Where construction activities are anticipated within the buffer zone, a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-46	30 Elena Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 103 metres north of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-47	21 Elena Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 140 metres north of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-48	25 Elena Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 137 metres north of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-49	278 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 278 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-50	284 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 244 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-51	314 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 155 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-52	N/A-Albert Street Bridge over CPR tracks, Oshawa	Class A Listed Property on Heritage Oshawa Inventory	**Direct Impacts Anticipated:** The bridge is located within the Project Footprint and has been identified for removal as part of the proposed undertaking. **Therefore, mitigation measures must be prepared to mitigate potential direct impacts.**	The Albert Street Bridge (BHR-52) will be removed as part of the proposed undertaking. A CHER has been completed for the bridge, and the MHC has made an interim decision, the bridge meets criteria contained in O.Reg 9/06[44] (PHP). An HIA is currently being undertaken for the bridge.
BHR-53	480 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 90 metres north and 122 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

[44] In 2023, O. Reg 9/06 was amended by O. Reg 569/22.

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-54	482 Albert Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 101 metres north and 122 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-55	484 Albert Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 108 metres north and 122 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-56	563 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 211 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-57	559 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 199 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-58	551 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 178 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-59	539 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 143 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-60	505 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 78 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-61	503 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 76 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-62	499 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 75 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-63	497 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 65 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-64	495 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 65 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-65	493 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 65 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-66	489 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 65 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-67	487 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 65 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-68	477 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 65 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-69	469 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 65 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-70	467 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 65 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-71	435 Albert Street, Oshawa	Identified during field review	**Indirect Impacts Anticipated:** The property is situated within the project ZOI. Construction activities are proposed approximately 4 metres west of the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	Where construction activities are anticipated within the buffer zone a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-72	433 Albert Street, Oshawa	Identified during field review	**Indirect Impacts Anticipated:** The property is situated within the project ZOI. Construction activities are proposed approximately 4 metres west of the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	Where construction activities are anticipated within the buffer zone a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.
BHR-73	431 Albert Street, Oshawa	Identified during field review	**Indirect Impacts Anticipated:** The property is situated within the project ZOI. Construction activities are proposed approximately 4 metres west of the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	Where construction activities are anticipated within the buffer zone a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-74	371 Albert Street, Oshawa	Identified during field review	**Indirect Impacts Anticipated:** The property is located within the Project ZOI. Construction activities are proposed approximately 5 metres west of the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	Where construction activities are anticipated within the buffer zone, a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.
BHR-75	367 Albert Street, Oshawa	Identified during field review	**Indirect Impacts Anticipated:** The property is located within the Project ZOI. Construction activities are proposed approximately 7 metres west of the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	Where construction activities are anticipated within the buffer zone, a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-76	355 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 19 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-77	351 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 32 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-78	323 Albert Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 122 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-79	263 Albert Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 299 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-80	256 Court Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 351 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-81	300 Court Street, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 204 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-82	113 Stacey Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 346 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-83	117 Stacey Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 346 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-84	121 Stacey Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 346 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-85	125 Stacey Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 346 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-86	129 Stacey Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 346 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-87	95 Wilkinson Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 313 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-88	67 Banting Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 118 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-89	69 Banting Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 120 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-90	71 Banting Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 122 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-91	73 Banting Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 124 metres southwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-92	83 Banting Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 140 metres southwest and 143 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-93	92 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 97 metres southwest and 118 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
CHL-1	106 to 136; 142 to 168; 145 to 167.5 Olive Avenue, Oshawa	Class A Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The CHL is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 108 metres south of the section of properties located closest to the Project Footprint. Therefore, the properties are not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-94	140 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 108 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-95	176 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 123 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-96	220 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 173 metres south and 128 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-97	253 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 25 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-98	249 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 37 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-99	245 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 48 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-100	229 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 125 metres southeast and 98 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-101	225 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 125 metres southeast and 109 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-102	219 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 125 metres south and 121 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-103	217 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 125 metres south and 136 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-104	213 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 125 metres south and 152 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-105	183 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 77 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-106	181 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 77 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-107	139 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 66 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-108	101 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 73 metres southeast and 73 metres southwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-109	97 Olive Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 85 metres southeast and 55 metres southwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-110	66 First Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 67 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-111	68 First Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 58 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-112	65 First Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 90 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-113	66 Second Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 117 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-114	548 Front Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 151 metres north of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-115	500 Howard Street, Oshawa	Class A Listed Property on the Municipal Heritage Register, Provincial Heritage Property of Provincial Significance	**Direct Impacts Anticipated:** BHR-115 is located within the Project Footprint and is part of the proposed Front Street (B2 Ritson) GO Station location. While plans for the future Front Street (B2 Ritson) GO Station are in early stages, plans for the property include: • Demolition of a portion of the property that does not include the heritage attributes of the PHPPS and construction of the Front Street (B2 Ritson) GO Station • Adaptive re-use of the building(s) on site for the Front Street (B2 Ritson) GO Station (and/or associated TOC) that will conserve the heritage attributes of the PHPPS **Therefore, mitigation measures must be prepared to mitigate potential direct impacts.** **Indirect Impacts Anticipated:** The building is located within the Project ZOI.	In accordance with the *Ontario Heritage Act* and associated Standards & Guidelines for Conservation of Provincial Heritage Properties for this Provincial Heritage Property of Provincial Significance: Priority will be given to avoiding impacts to the identified heritage attributes. This will be guided by the Strategic Conservation Plan (SCP) that Metrolinx has prepared for the property, as well as Heritage Impact Assessments (HIAs). The following reports will be completed following the TPAP: • Phase I - HIA for the stabilization, protection and mothballing of Part 1 (all heritage attributes are encompassed in Part 1); the identification of all programming needs; the potential full or partial demolition of Part 2; and the potential (partial or complete) transfer of Part 2 out of provincial control.

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
			If the proposed Front Street (B2 Ritson) Go Station results only in partial demolition or alteration of the building(s) on site, vibration monitoring should be considered for remaining portions of the structure(s). The position of the building(s) within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	– The HIA for the demolition of Part 2 of the building on the property was completed on April 13, 2023. The demolition of Part 2 received MCM Minister's Consent on May 26, 2023. – If construction of the Front Street (B2 Ritson) GO Station is to occur during this phase (Phase I), an additional HIA will be prepared, to describe all impacts and mitigations. • Phase II – HIA will be completed for the rehabilitation, interpretation and adaptive reuse of Part 1 of the property. If the construction of the new Front Street (B2 Ritson) GO Station was not assessed previously in Phase I, it will be included in this HIA. It will also include the development of the TOC and adaptive reuse of Part 1. To protect the heritage value of Part 1, legally binding protections are required and will be secured through applicable agreements via the TOC program, or as part of a future disposition. A future disposition would be subject to an additional Minister's Consent prior to any demolition, removal, or

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
				transfer of any part of the property out of provincial control. Where construction activities are anticipated within the buffer zone a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.
			Direct Impacts Anticipated: Tree removal, fence removal and grading would be required along the north edge of the property to provide grading of the 2nd GO Track.	**Preferred Option:** Avoid the BHR and any of its heritage attributes but encroachment onto the subject property anticipated. The trees and chain link fence along the north boundary of the subject property would be removed to accommodate grading but would have no impact on any of the identified heritage attributes of the subject property.
			Direct Impacts Anticipated: Potential relocation of Front Street Multi-Use Crossing (Michael Starr Trail) as a bridge or tunnel crossing to the east of the existing crossing location in order to provide an opportunity to connect the Trail to proposed platform(s) of the proposed future Ritson GO Station while maintaining existing multi-use crossing access. Proposed relocated multi-use crossing may encroach onto the north side of 500 Howard Street.	**Preferred Option:** The proposed relocation of Front Street Multi-Use Crossing (Michael Starr Trail) as a bridge or tunnel crossing may be located west of 500 Howard Street and partially within municipal right-of-way with no encroachment on the subject property. **Alternative Option:** Should the Front Street Multi-Use Crossing (Michael Starr Trail) be relocated to the east of the existing crossing location, there would be anticipated encroachment onto the north boundary of 500 Howard Street during construction and in operation. Heritage attributes

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
				located on Part 1 of the property would not be impacted. A Cultural Heritage Risk Management Plan will be developed before work commences to facilitate undertaking proposed work in a manner which mitigates the possibility of impacts to the BHR
BHR-116	491 Howard Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area and is adjacent to the Project Footprint. Construction activities are proposed approximately 15 metres west of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-117	497 Howard Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area and is adjacent to the Project Footprint. Construction activities are proposed approximately 15 metres west of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-118	353 Drew Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 93 metres south of the property.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
			Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	
BHR-119	481 Drew Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 97 metres west of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-120	489 Drew Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 97 metres west of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-121	497 Drew Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 97 metres west of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-122	500 Drew Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 49 metres west of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-123	362 Drew Street, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area and is adjacent to the Project Footprint. Construction activities are proposed approximately 46 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-124	242 Mitchell Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 38 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-125	248 Mitchell Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 27 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-126	391 Mitchell Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area and is adjacent to the Project Footprint. Construction activities are proposed more than approximately 75 metres south of the residence. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-127	249 Mitchell Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 15 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-128	225 Mitchell Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 504 metres south and 83 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-129	242 Graburn Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 47 metres north of the residence and 69 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-130	255 Graburn Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 30 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-131	241 Graburn Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 68 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-132	235 Graburn Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 91 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-133	217 Graburn Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 93 metres north and 137 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-134	224 Beatty Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 145 metres west and 108 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-135	228 Beatty Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 93 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-136	232 Beatty Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 77 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-137	243 Beatty Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 34 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-138	235 Beatty Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 58 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-139	225 Beatty Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 96 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-140	221 Beatty Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 126 metres northeast and 130 metres west of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-141	223 McNaughton Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 165 metres northwest and 166 metres northeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-142	220 Etna Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 166 metres northwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-143	223 Etna Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 212 metres northwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-144	230 Etna Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 193 metres northwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-145	214 Toronto Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 208 metres northwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-146	300 Ritson Road South, Oshawa	Class B Listed Property on the Municipal Heritage Register	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 48 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-147	356 Ritson Road South, Oshawa	Class A Listed Property on the Municipal Heritage Register	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses. **Therefore, mitigation measures must be prepared to mitigate potential direct impacts.** **Indirect Impacts Anticipated:** The property is situated within the Project ZOI. Construction activities are proposed approximately 3 metres east of the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	The property at 356 Ritson Road is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC has made an interim decision the property meets criteria contained in O. Reg. 9/06 (Provincial Heritage Property). An HIA is currently being undertaken for the property.

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-148	464 Ritson Road South, Oshawa	Identified during field review	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses. **Therefore, mitigation measures must be prepared to mitigate potential direct impacts.** Indirect Impacts Anticipated: The property is situated within the Project ZOI. Construction activities are proposed approximately 3 metres east of the church. The position of the church within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	The property at 464 Ritson Road South is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC has made an interim decision the property meets criteria contained in O. Reg. 9/06 (PHP). Based on the results of the CHER and the MHC decision, an HIA is not required for 464 Ritson Road South due to the distance between the proposed undertaking and identified heritage attributes. Should a change to the proposed undertaking at 464 Ritson Road South be necessary and the potential for interaction with identified heritage attributes is identified, the MHC decision will be revisited and an HIA will be undertaken by a qualified person, if required.

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-149	470 Ritson Road South, Oshawa	Identified during field review	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses. **Indirect Impacts Anticipated:** The property is situated within the Project ZOI. Construction activities are anticipated adjacent to the church. The position of the church within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities.	The property at 470 Ritson Road is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC made an interim decision that 470 Ritson Road South is not a PHP or PHPPS.
BHR-150	359 Ritson Road South, Oshawa	Identified during field review	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses.	The property at 359 Ritson Road is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC made an interim decision that 359 Ritson Road South is not a PHP or PHPPS.

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-151	349 Ritson Road South, Oshawa	Identified during field review	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses. **Indirect Impacts Anticipated:** The property is situated within the Project ZOI. Construction activities are proposed adjacent to the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities.	The property at 349 Ritson Road is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC made an interim decision that 349 Ritson Road South is not a PHP or PHPPS.
BHR-152	392 Oshawa Boulevard South	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed approximately 21 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-153	429 Crerar Avenue, Oshawa	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area and is adjacent to the Project Footprint. Construction activities are proposed approximately 34 metres south of the residence. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-154	393 Wilson Road South, Oshawa	Identified during field review	**Indirect Impacts Anticipated:** The property is situated within the project ZOI. Construction activities are proposed approximately 9 metres west of the residence. The position of the residence within the ZOI has the potential for indirect impacts resulting from vibration damage during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts.**	Where construction activities are anticipated within the buffer zone a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.
BHR-155	374 Farewell Street, Oshawa	Identified during field review	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses.	The property at 374 Farewell Street is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC made an interim decision that 374 Farewell Street is not a PHP or PHPPS.

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-156	N/A—Farewell Street Multi-Use Bridge over CPR tracks	Identified during field review	**Direct Impacts Anticipated:** The bridge is located within the Project Footprint and has been identified for replacement as part of the proposed undertaking. **Therefore, mitigation measures must be prepared to mitigate potential direct impacts.**	The Farewell Street Multi-Use Bridge (BHR-156) is planned for replacement. A CHER has been completed for this bridge, and the MHC has made an interim decision that the bridge meets criteria contained in O. Reg. 9/06 (PHP). An HIA is currently being undertaken for the bridge.
BHR-157	N/A- St. Wolodymyr and St. Olha Ukrainian Cemetery, Clarington	Identified by Municipality of Clarington as a potential cultural heritage resource	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses. **Therefore, mitigation measures must be prepared to mitigate potential direct impacts.**	The property is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC has made an interim decision the property meets criteria contained in O. Reg. 9/06 (Provincial Heritage Property). An HIA is currently being undertaken for the cemetery.
BHR-158	N/A—Trull Cemetery located on Baseline Road, Clarington	Previously identified by Amec Foster Wheeler in 2018 in the CHSR for the Oshawa to Bowmanville Expansion	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 93 metres northwest of the cemetery property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-159	1558 Baseline Road, Clarington	Identified as a potential cultural heritage resource by	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary	The property at 1558 Baseline Road is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC made an

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
		Municipality of Clarington	and will be assessed as the Project progresses.	interim decision that 1558 Baseline Road is not a PHP or PHPPS.
BHR-160	1580 Baseline Road, Clarington	Identified as a potential cultural heritage resource by Municipality of Clarington	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses.	Where a known or potential built heritage resource or cultural heritage landscape may be directly and adversely impacted, and where it has not yet been evaluated for CHVI, completion of a CHER is required to fully understand its CHVI, level of significance, and heritage attributes. If the property is found to be of CHVI, then a HIA will be undertaken. Following completion of a CHER, the MHC made an interim decision that 1580 Baseline Road is not a PHP or PHPPS.
BHR-161	1598 Baseline Road, Clarington	Listed as a Primary Property on the Clarington Heritage Inventory	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses.	The property is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC has made an interim decision the property meets criteria contained in O. Reg. 9/06 (PHP). Based on the results of the CHER and the MHC decision, an HIA is not required for 1598 Baseline Road due to the distance between the proposed undertaking and identified heritage attributes. Should a change to the proposed undertaking at 1598 Baseline Road be necessary and the potential for interaction with identified heritage attributes is identified, the MHC decision will be

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
				revisited and an HIA will be undertaken by a qualified person, if required.
BHR-162	1218 Trulls Road, Clarington	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area and is adjacent to the Project Footprint. Construction activities are proposed more than approximately 202 metres southeast of the barn. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-163	1711 Baseline Road, Clarington	Listed as a Primary Property on the Clarington Heritage Inventory	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 267 metres northwest of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-164	1108 Holt Road, Clarington	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 72 metres southeast of the barn. Construction activities are also proposed approximately 25 metres south of the heavily modernized residence and 40 metres south of the second residence that was not easily visible from the ROW. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-165	1261 Holt Road, Clarington	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area and is adjacent to the Project Footprint. Construction activities are proposed more than approximately 400 metres south of the residence. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-166	2185 Bloor Street, Clarington	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 358 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-167	2228 Baseline Road, Clarington	Listed on Municipal Heritage Register	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses. **Therefore, mitigation measures must be prepared to mitigate potential direct impacts.**	The property at 2228 Baseline Road is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and, the MHC made an interim decision that 2228 Baseline Road meets criteria contained in O. Reg. 9/06 (PHP) and is not a PHPPS. An HIA is currently being undertaken for the property.
BHR-168	7 Pethick Street, Bowmanville	Identified during field review	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area and is adjacent to the Project Footprint. Construction activities are proposed more than approximately 153 metres south of the church. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-169	1490 Baseline Road West, Clarington	Identified for consideration	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements.	The property at 1490 Baseline Road West is anticipated to be directly impacted due to potential property acquisitions and/or

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
		by municipal staff	Potential property impacts are preliminary and will be assessed as the Project progresses.	easements. A CHER has been completed for the property and the MHC made an interim decision that 1490 Baseline Road is not a PHP or PHPPS.
BHR-170	1660 Baseline Road West, Clarington	Identified for consideration by municipal staff	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area and is adjacent to the Project Footprint. Construction activities are proposed more than approximately 104 metres northwest of the residence. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-171	1766 Baseline Road West, Clarington	Identified for consideration by municipal staff	**Direct Impacts Anticipated:** Direct impacts are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses. **Therefore, mitigation measures must be prepared to mitigate potential direct impacts.**	The property at 1766 Baseline Road West is anticipated to be directly impacted due to potential property acquisitions and/or easements. A CHER has been completed for the property and the MHC has made an interim decision (pending an interior assessment) the property meets criteria contained in O. Reg. 9/06 (Provincial Heritage Property). Based on the results of the CHER and the MHC decision, an HIA is not required for 1766 Baseline Road due to the distance between the proposed undertaking and identified heritage attributes. Should a change to the proposed undertaking at 1766 Baseline Road be necessary and the potential for interaction with identified heritage attributes is

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
				identified, the MHC decision will be revisited and an HIA will be undertaken by a qualified person, if requried.
BHR-172	1825 Baseline Road West, Clarington	Identified for consideration by municipal staff	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 50 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-173	334 Albert Street, Oshawa	Listed (Class A Property)	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 90 metres south of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-174	24 Mill Street, Oshawa	Listed (Class B Property)	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 70 metres north of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A

CHR Number	Location	Previous Heritage Recognition	Type and Description of Potential/Anticipated Impact	Mitigation Measures
BHR-175	285 Celina Street, Oshawa	Listed (Class B Property)	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area. Construction activities are proposed more than approximately 243 metres southeast of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required.	N/A
BHR-176	381 Celina Street, Oshawa	Listed (Class B Property)	**No Impacts Anticipated:** The property is located within the Cultural Heritage Assessment Area and adjacent to the Project Footprint. Construction activities are proposed more than approximately 14 metres east of the property. Therefore, the property is not at risk of direct or indirect impacts and no mitigation measures or further cultural heritage evaluation are required	N/A

Although not explicitly stated in each of the subsections, it is acknowledged that there is the potential for additional BHRs or CHLs to be affected should the Project Footprint change or if there is a change in the impacts that were not captured in the CHR: Existing Conditions and Preliminary Impact Assessment undertaken for this Project.

5.9.1.1 Linear Facilities

Construction

Nine BHRs were identified to be at risk for direct impacts due to the construction of linear facilities, including:

- 83 Avenue Street (BHR-6)
- 399 Simcoe Street South (BHR-22)
- St. Wolodymyr and St. Olha Cemetery (BHR-157)
- 1558 Baseline Road (BHR-159)
- 1580 Baseline Road (BHR-160)
- 1598 Baseline Road (BHR-161)
- 2228 Baseline Road (BHR-167)
- 1490 Baseline Road (BHR-169)
- 1766 Baseline Road (BHR-171)

CHERs were undertaken to fully understand the CHVI of the BHRs and determine each BHRs level of significance (refer to Appendix A7).

Avenue Street

The MHC made an interim decision that 83 Avenue Street is not a PHP or PHPPS. Therefore, no further cultural heritage studies are required for this property.

Simcoe Street South

The MHC made an interim decision that 399 Simcoe Street South is not a PHP or PHPP. Therefore, no further cultural heritage study is required for this property.

St. Wolodymyr and St. Olha Cemetery

The MHC made an interim decision that the St. Wolodymyr and St. Olha Cemetery is a PHP and not a PHPPS. Direct impacts to the cemetery are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and

will be assessed as the Project progresses. An HIA is being prepared for the cemetery to address potential impacts to the property.

Baseline Road

The MHC made an interim decision that 1598 Baseline Road, 2228 Baseline Road, and 1766 Baseline Road are PHPs and that 1490 Baseline Road, 1604 Baseline Road and 1558/1580 Baseline Road are not PHPs or PHPPs. Therefore, no further cultural heritage studies are required for 1490 Baseline Road, 1558/1580 Baseline Road, and 1604 Baseline Road. While 1604 Baseline Road was not identified as a potential or previously identified built heritage resource or cultural heritage landscape, it was included in a CHER due to its common present-day ownership with 1558/1580 Baseline Road and 1598 Baseline Road. Direct impacts to 1598 Baseline Road, 2228 Baseline Road, and 1766 Baseline Road are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses. An HIA is being prepared for 2228 Baseline Road to address potential impacts to the property. It was determined that a HIA for 1598 Baseline Road and 1766 Baseline Road was not required to the distance from the proposed undertaking and the identified heritage attributes.

Following the assessment of impacts, the below listed properties were identified to be situated within the ZOI of planned construction activities and are at risk for indirect, vibration-related impacts:

- CPR Bridge over CN Tracks, Oshawa (BHR-1)
- 33 Avenue Street, Oshawa (BHR-8)
- 399 Simcoe Street South, Oshawa (BHR-22)
- 45 Albany Street, Oshawa (BHR-45)
- 435 Albert Street, Oshawa (BHR-71)
- 433 Albert Street, Oshawa (BHR-72)
- 431 Albert Street, Oshawa (BHR-73)
- 371 Albert Street, Oshawa (BHR-74)
- 367 Albert Street, Oshawa (BHR-75)
- 356 Ritson Road South, Oshawa (BHR-147)
- 464 Ritson Road South, Oshawa (BHR-148)

- 349 Ritson Road South, Oshawa (BHR-151)
- 393 Wilson Road, Oshawa (BHR-154)

All wetlands and watercourses have cultural significance to Indigenous communities. There is the potential for direct impacts to the wetlands and watercourses during construction activities.

Operations

It is anticipated that ongoing operations will not result in higher vibration levels than those currently generated following the application of mitigation measures. Therefore, BHRs are not anticipated to be affected as a result of operations and no direct or indirect effects on the properties are anticipated as a result of operations.

5.9.1.2 GO Station Locations

Construction

There is the potential for both direct and indirect effects to the property at 500 Howard Street (BHR-115), a provincial heritage property of provincial significance. A CHER was completed for 500 Howard Street by ERA in 2015 and determined the site to contain CHVI. A statement of CHVI was prepared for the property and heritage attributes were identified (ERA 2015; Metrolinx 2016). A Strategic Conservation Plan was completed on November 4, 2022 and approved by the Deputy Minister on November 25, 2022. HIAs will be required for two phases that will result in different impacts to the property:

- Phase I - HIA for the stabilization, protection and mothballing of Part 1 (all heritage attributes are encompassed in Part 1); the identification of all programming needs; the potential full or partial demolition of Part 2; and the potential (partial or complete) transfer of Part 2 out of provincial control.
    - The HIA for the demolition of Part 2 of the building on the property was completed on April 13, 2023. The demolition of Part 2 received MCM Minister's Consent on May 26, 2023.
    - If construction of the Front Street (B2 Ritson) GO Station is to occur during this phase (Phase I), an additional HIA will be prepared, to describe all impacts and mitigations.

- Phase II – HIA will be completed for the rehabilitation, interpretation and adaptive reuse of Part 1 of the property. If the construction of the new Front Street (B2 Ritson) GO Station was not assessed previously in Phase I, it will be included in this HIA. It will also include the development of the TOC and adaptive reuse of Part 1. To protect the heritage value of Part 1, legally binding protections are required and will be secured through applicable agreements via the TOC program, or as part of a future disposition. A future disposition would be subject to an additional Minister's Consent prior to any demolition, removal, or transfer of any part of the property out of provincial control.

There are no BHRs in proximity to the remaining three GO station locations and as such no impacts to BHRs are anticipated during construction.

Operations

It is anticipated that ongoing operations will not result in higher vibration levels than those currently generated following the application of mitigation measures. Therefore, BHR-115 is not anticipated to be affected as a result of operations and no direct or indirect effects on the property is anticipated as a result of operations.

There are no BHRs in proximity to the remaining three GO station locations and as such no impacts to BHRs are anticipated during operations.

5.9.1.3 Bridges

Construction

Two bridges were identified to be at risk for direct impacts, Albert Street Bridge (BHR-52) and Farewell Street Multi-Use Bridge (BHR-156). The Albert Street Bridge will be removed and the Farewell Street Multi-Use Bridge will be removed and replaced.

Due to the construction of new bridges or modifications to existing bridges, several other BHRs were identified for direct impacts, including:

- 394 Simcoe Street South, Oshawa (BHR-16)
- 356 Ritson Road South, Oshawa (BHR-147)
- 464 Ritson Road South, Oshawa (BHR-148)
- 470 Ritson Road South, Oshawa (BHR-149)
- 359 Ritson Road South, Oshawa (BHR-150)
- 349 Ritson Road South, Oshawa (BHR-151)
- 374 Farewell Street, Oshawa (BHR-155)

A CHERs and CHERRs were undertaken to fully understand the CHVI of the BHRs and determine each BHR's level of significance (refer to Appendix A7).

Farewell Street

The Farewell Street Multi-Use Bridge (BHR-156) is planned to be replaced as part of the proposed undertaking. A CHER has been completed for this bridge, and the Metrolinx Heritage Committee (MHC) has made an interim decision that the bridge met criteria contained in O. Reg. 9/06 (Provincial Heritage Property). An HIA is currently being undertaken for the bridge.

The MHC made an interim decision that 374 Farewell Street is not a PHP or PHPPS. Therefore, no further cultural heritage studies are required for this property.

Albert Street

The Albert Street Bridge (BHR-52) is planned to be removed as part of the proposed undertaking. A CHER has been completed for this bridge, and the Metrolinx Heritage Committee (MHC) has made an interim decision that the bridge met criteria contained in O. Reg. 9/06 (Provincial Heritage Property). An HIA is currently being undertaken for the bridge.

Simcoe Street South

The MHC made an interim decision that 394 Simcoe Street South is not a PHP or PHPP. Therefore, no further cultural heritage study is required for this property.

Ritson Road South

The MHC made an interim decision that 356 Ritson Road South and 464 Ritson Road South are PHPs and that 470 Ritson Road South, 359 Ritson Road South, and 349 Ritson Road South are not PHPs or PHPPs. Therefore, no further cultural heritage studies are required for 470 Ritson Road South, 359 Ritson Road South, and 349 Ritson Road South.

Direct impacts to 356 Ritson Road South and 464 Ritson Road South are anticipated due to potential property acquisitions and/or easements. Potential property impacts are preliminary and will be assessed as the Project progresses. An HIA is being prepared for 356 Ritson Road South to address the potential impacts to heritage attributes identified. An HIA is not required for 464 Ritson Road South due to the distance between the proposed undertaking and the identified heritage attributes.

In addition, the following properties were identified to be situated within of the ZOI of planned construction activities associated with bridges and are at risk for indirect, vibration-related impacts:

- 15 Hall Street, Oshawa (BHR-11)
- 394 Simcoe Street South, Oshawa (BHR-16)

As noted above in Section 5.9.1.1, there is the potential for direct impacts to wetlands and watercourses during construction activities.

Operations

It is anticipated that ongoing operations will not result in higher vibration levels than those currently generated following the application of mitigation measures. Therefore, BHRs are not anticipated to be affected as a result of operations and no direct or indirect effects on the properties are anticipated as a result of operations.

5.9.2 Archaeology

Based on the results of property inspections, parts of the Archaeological Assessment (AA) Area were considered to possess archaeological potential and will require a Stage 2 AA to confirm the possible presence of archaeological resources and the potential for impacts (refer to Appendix A8).

Potential effects are described below, while corresponding mitigation measures and monitoring activities relating to the cultural environment are described in Section 5.10.

Although not explicitly stated in each of the subsections, it is acknowledged that there is the potential for disturbance of unassessed or undocumented archaeological resources during construction activities.

5.9.2.1 Linear Facilities

Construction

As identified in the Stage 1 AA (refer to Appendix A8, Figure 8), areas directly adjacent to the rail corridor require additional AA. A Stage 2 AA will be undertaken prior to any construction activities, to confirm the possible presence of archaeological resources and the potential for impacts.

Operations

Operations will not require additional excavation, and no effects on archaeology are anticipated during the ongoing operations and maintenance of linear facilities.

5.9.2.2 GO Station Locations

Construction

As identified in the Stage 1 AA (refer to Appendix A8, Figure 8), areas associated with B1 Thornton's Corners East GO Station, B3 Courtice GO Station and B4 Bowmanville GO Station require additional AA. A Stage 2 AA will be undertaken prior to any construction activities, to confirm the possible presence of archaeological resources and the potential for impacts.

Operations

Operations will not require additional excavation, and no effects on archaeology are anticipated during the ongoing operations and maintenance of the GO station locations.

5.9.2.3 Bridges

Construction

As identified in the Stage 1 AA (refer to Appendix A8, Figure 8), areas directly adjacent to the bridges require additional AA. A Stage 2 AA will be undertaken prior to any construction activities, to confirm the possible presence of archaeological resources and the potential for impacts.

Operations

Operations will not require additional excavation, and no effects on archaeology are anticipated during the ongoing operations and maintenance of the Project.

5.10 Summary of Potential Effects, Mitigation Measures and Monitoring Requirements

Table 5.4 summarizes the effects, mitigation measures and proposed monitoring for the various components of the environment described in the previous sections of the EPR Addendum.

Metrolinx is responsible for confirming that the recommendations are met but may direct a third party to undertake future activities (i.e., contractor, technical consultant). The intent of this table is to provide a summary of those commitments and responsibility of third parties where Metrolinx determines applicability. These are recommendations that will be confirmed as Project planning advances.

Table 5.4: Potential Effects, Mitigation Measures and Monitoring

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment	Aquatic Environment	• Removal or impacts to wetland; aquatic and riparian vegetation; headwater drainage features; degradation of wetlands as result of dewatering and discharge activities; erosion and sedimentation to wetlands/waterbodies from construction; and risk of contamination to wetlands/waterbodies as a result of spills	Potential effects anticipated	No potential effect anticipated	Linear Facilities Bridges GO Station Locations	• Construction activities will maintain the buffers established during the design phase to reduce potential negative impacts to wetlands and waterbodies. • Shorelines or banks disturbed by construction activities will be immediately stabilized by any activity associated with the Project to prevent erosion and/or sedimentation, preferably re-vegetation with native species suitable for the site. • An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019), will be prepared prior to and implemented during construction to reduce the risk of sedimentation to the waterbody. • A Spill Prevention and Response Plan will be developed before work commences so that procedures and policies are in place during construction to reduce impacts to wetlands and watercourses. • In wetland areas where vernal pooling occurs, prior to dewatering isolated work areas, wildlife will be captured and relocated to suitable habitat outside of the work area under a Wildlife Scientific Collector's Authorization from the Ministry of Natural Resources and Forestry (MNRF). If applicable, fish will be collected in accordance with the *Fisheries Act.* • Vegetation removals will also consider and mitigate potential impacts to wetland communities. Until such a time, that an Ontario Wetland Evaluation System (MNR 2014) evaluation is completed and evaluated by MNRF, unevaluated wetlands will be considered as significant for the purposes of assessing impacts. • Wetland communities potentially affected by the Project will be clearly staked out on site. • If dewatering is proposed, then it is recommended to be undertaken during the winter when the potential impacts of changes in water levels are less significant in wetland communities. During detailed design, the need for a dewatering zone of influence assessment and dewatering monitoring plan should be evaluated. The dewatering monitoring plan, if required, will monitor for potential negative impacts on nearby wetlands and adjacent vegetation communities to confirm if they would be affected due to dewatering activities. An adaptive management plan will be prepared if negative impacts are observed. • Prior to dewatering isolated work areas, fish will be captured and relocated to suitable habitat outside of the work area under a Licence to Collect Fish for Scientific Purposes from the MNRF. Similarly, wildlife will be captured and relocated to suitable habitat outside of the work area under a Wildlife Scientific Collector's Authorization from the MNRF.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include alteration of activities to reduce impacts and enhance mitigation measures.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Aquatic Environment	• Dewatering activities and water discharge resulting in changes in water velocity or temperature; changes in soil and erosion; release of contaminated and sediment-laden water; changes in fish habitat structure and cover; changes in food supply, changes in nutrient concentration; changes in access to habitat leading to the displacement or stranding of fish	Potential effects anticipated	No potential effect anticipated	Linear Facilities Bridges	• All requirements of the *Fisheries Act* will be met. • Headwater Drainage Features will be protected in accordance with the PPS (2020) and CLOCA Policies and Regulations. • Consideration will be given to mitigating short and long-term water quality impacts to the McLaughlin Bay will be mitigated through, for example, the implementation of an ESC plan, adequate stormwater management measures and riparian vegetation planting. • In the event that in-water and/or near water construction works are required, appropriate mitigation measures will be followed, as identified in Applicable Law and through consultation with the relevant authorities including DFO. In-water works will be planned to consider timing windows to protect fish, including their eggs, juveniles, community composition, spawning adults, and/or the organisms upon which they feed. The timing windows were confirmed with MNRF and CLOCA. Based on guidance from the MNRF (2013) and CLOCA's Fishery Management Plan (CLOCA 2013b) the restricted timing windows for in-water activities (i.e., when in-water work is not permitted) are as follows: – Goodman Creek (Watercourse Crossing Location (WC-1) - March 15 to July 15 – Oshawa Creek (WC-2) - September 15 to July 15 – Harmony Creek (WC-3) - September 15 to July 15 – Farewell Creek (WC-4) - September 15 to July 15 – Unnamed Tributary of Lake Ontario in proximity to the rail corridor and west of Prestonvale Road (WC-5) - March 15 to July 15 – Robinson Creek (WC-6) - September 15 to July 15 – Tooley Creek and tributaries in proximity to the rail corridor and west of Courtice Road and north of Baseline Road West (WC-7 and WC-9) - March 15 to July 15 – Tooley Creek (WC-8) - September 15 to July 15 – Darlington Creek (WC-11) - September 15 to July 15 • Darlington Creek tributaries in proximity to the rail corridor and south of Baseline Road West; east of Holt Road; and east of Maple Grove Road (WC-10, WC-12, WC-13 and WC-14) - March 15 to July 15	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. • Monitoring of dewatering activities will be undertaken to confirm sediment-laden discharge; and changes in visible scour/erosion.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Aquatic Environment	• Stormwater runoff from the rail corridor has the potential to effect surface water quality draining to watercourses, as there is an increased potential for runoff to contain contaminants resulting from management activities (e.g., herbicides, etc.) • Erosion and sedimentation to wetlands/waterbodies from maintenance activities; and risk of contamination to wetlands/waterbodies as a result of spills	No potential effects anticipated	Potential effects anticipated	Linear Facilities Bridges	• An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019), will be prepared prior to and implemented during maintenance activities to reduce the risk of sedimentation to the waterbody. - A Spill Prevention and Response Plan will be developed before work commences so that procedures and policies are in place during maintenance activities to reduce impacts to wetlands and watercourses.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include alteration of activities to reduce impacts and enhance mitigation measures.
	Aquatic Environment	• Potential for temporary impact to wetlands, headwater drainage features, waterbodies and fish habitat during culvert maintenance or culvert replacements	No potential effects anticipated	Potential effects anticipated	Linear Facilities Bridges	• Prepare and implement sediment and erosion control plan for any maintenance activities in or adjacent to wetlands, waterbodies, and headwater drainage features. • Wildlife passage analysis (e.g., openness ratio) of all structures within natural heritage systems will be conducted to determine existing conditions to help guide detailed design of new structures (including extensions).	• Regular on-site inspections during in-water construction by a qualified environmental inspector. • Post construction monitoring to confirm conditions with respect to wildlife passage opportunities.
	Aquatic Environment	• Potential for temporary impact to fish and fish habitat during culvert maintenance or culvert replacements	No potential effects anticipated	Potential effects anticipated	Linear Facilities	• Prepare and implement an Erosion and Sediment Control Plan for any maintenance activities below the ordinary high water mark. • Implement measures to protect fish and fish habitat during in-water construction activities i.e., restricted timing window, fish relocation. • Fish passage analysis (e.g., 2-year storm event/bankfull) of all structures in the Natural Environment Assessment Area will be conducted to determine existing conditions to help guide detailed design of new structures (including extensions).	• Regular on-site inspections during in-water construction by a qualified environmental inspector. • Post construction monitoring to confirm conditions with respect to fish passage.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Terrestrial Environment	• Removal of vegetation communities • Damage to adjacent vegetation or ELC communities as a result of accidental intrusion	Potential effects anticipated	No potential effects anticipated	All Project Components	• Vegetation removal will be avoided and limited to the Metrolinx right-of-way to the extent possible. • Compensation for tree removals will be undertaken in accordance with provisions outlined in Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Construction fencing and/or silt fencing, where appropriate, will be installed and maintained to clearly define the construction footprint and prevent accidental damage or intrusion to adjacent vegetation or ELC communities. • Provide compensation for the removal of vegetation in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Provide compensation for disturbed or removed wetlands based on Metrolinx guidelines and in consultation with CLOCA. • Temporarily disturbed areas will be re-vegetated using non-invasive, native plantings and/or seed mix, appropriate to the site conditions and adjacent vegetation communities. Seed mixes will be used in conjunction with an appropriate non-invasive cover crop as needed. • Vegetation removals will also consider and mitigate potential impacts to sensitive species (e.g., migratory birds and SAR) and features (e.g., SWH). Refer to the mitigation measures for the Wildlife, SWH and SAR Environmental Components described below.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. • If required as a condition of a permit or approval associated with governing by-laws/regulations, vegetation compensation activities will be monitored in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction).
	Terrestrial Environment	• Removal of vegetation during operations vegetation maintenance activities, if applicable • Removal and/or damage to adjacent vegetation or ELC communities as a result of accidental intrusion during vegetation maintenance activities, if applicable	No potential effects anticipated	Potential effects anticipated	All Project Components	• Vegetation removal will be avoided and limited to the Metrolinx right-of-way to the extent possible. • Sensitive wildlife timing restrictions will be followed for construction activities and operational maintenance activities (e.g., removal of vegetation outside of the breeding bird season). • Herbicide applications will be administered subject to the *Pesticides Act*. • Temporarily disturbed areas will be re-vegetated using non-invasive, preferable native plantings and/or seed mix.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. • Monitoring and management of trees/vegetation in the rail corridor right-of-way will be undertaken in accordance with the Integrated Vegetation Management (IVM) Program within the Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction).
	Terrestrial Environment	• City and private tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• An Arborist Report will be prepared by an International Society of Arboriculture (ISA) Certified Arborist which meets regulatory requirements. The Arborist Report will be completed with regard to Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction), *Ontario Forestry Act* R.S.O. 1990, the ESA, 2007, and other regulations, municipal by-laws and best management practices as applicable.	• Regular inspection in areas of vegetation removal will be undertaken as required during construction to confirm that fencing is intact; only specified trees are removed; and no damage is caused to the remaining trees and adjacent vegetation communities.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Terrestrial Environment	• City and private tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• The Arborist Report will include, but not be limited to, the individual identification of trees within the Project Footprint, including those that require removal or preservation, or trees that may be injured as a result of the Project. Trees to be identified within the Project Footprint may include those on Metrolinx property, trees on public and private lands, and boundary trees. Municipal by-laws dictate the minimum area buffers to be inventoried and DBH that requires inventory as well as additional requirements for tree inventories and tree protection plans. • The Arborist Report will include all information needed to establish compensation ratios and tree end use (including identification of high value trees) as per Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Prior to the undertaking of tree removals, a Tree Removal Strategy/Preservation Plan, building upon the considerations and elements set out in Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction), will be developed during detailed design to document tree protection and mitigation measures that follow municipal by-laws and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections. • If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2022), and subsequent amendments. Applicable bylaws will be followed. • Pruning of branches will be conducted by staff trained to employ proper pruning techniques as identified by the International Society of Arboriculture and Landscape Ontario. • Metrolinx will adhere to all applicable bylaws and regulations for tree removals outside of Metrolinx properties. • Pruning of branches will be conducted by staff trained to employ proper pruning techniques as identified by the International Society of Arboriculture and Landscape Ontario. • Tree Protection Zone (TPZ) fencing will be established to protect and prevent tree injuries. TPZs will be clearly staked prior to construction using barriers in accordance with local by-law requirements. • Vegetation restoration and planting plans will be shared with Indigenous communities for feedback. • Upon receiving the necessary Project approvals and prior to the commencement of tree removals, all trees designated for preservation must be flagged in the field. All designated preservation areas must be left standing and undamaged during site works. • Vegetation removal will be avoided and limited to the Metrolinx properties and ROW to the extent possible. • Vegetation removals will also consider and mitigate potential impacts to sensitive species, e.g., migratory birds and SAR, and features, e.g., designated natural areas and SWH. Refer to the mitigation measures for the Wildlife, SWH and SAR Environmental Components described above.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. • If required, the success of vegetation compensation activities will be monitored in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning. • Monitoring requirements will be undertaken in accordance with conditions of permits and approvals. • Monitoring and management of trees/vegetation within the rail corridor ROW will be undertaken in accordance with the IVM Program.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Terrestrial Environment cont.	• City and private tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• Removals are to be completed outside of migratory bird nesting season from, approximately, April 1 to August 31. Removals may take place during this restricted time only if the requirements of the MBCA are met and nesting activity is routinely monitored by qualified individuals (i.e., Wildlife Biologists). • The following is the process that shall be carried out if tree removals are requested during the restricted time indicated in the MBCA: - Contact a qualified individual (i.e., wildlife biologist or ornithologist) to determine if nesting birds are within the tree removal disturbance area. Nest searches are required and will be completed by a qualified wildlife biologist or ornithologist no more than 48 hours prior to vegetation removal and no earlier than 7 days prior to the activity. - If the wildlife biologist / ornithologist has determined that there are nesting birds onsite, there will be no tree removals/chipping conducted within the boundary set out by the specialist. Tree removals can resume within this area at the end of the nesting season, August 31, or if the wildlife biologist / ornithologist has determined the birds have left the nest. - If the wildlife biologist / ornithologist determines there are no migratory birds nesting within the disturbance area, the Contractor has 7 days to conduct removals. At the end of 7 days, if removals and chipping is not complete, the wildlife biologist / ornithologist will return to the site and proceed with another assessment. If there are still no birds, work can resume for another 7 days. This process will continue until all removals and chipping is complete. • Upon completion of the tree removals, all felled trees are to be removed from the site. No lumber or brush from the clearing is to be stored on the site. Any chipping, cutting or brush cleanup are to be completed outside of the bird nesting season. These works may take place during this restricted time only if the requirements of the MBCA are met and nesting activity is routinely monitored by qualified individuals (i.e., wildlife biologists or ornithologists).	
	Terrestrial Environment	• Footprint impacts and potential for the establishment of invasive species and other incompatible species on integrated vegetation management (IVM)	Potential effects anticipated	No potential effects anticipated	All Project Components	• An IVM Plan will be developed and implemented that is in adherence with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction) and the IVM Program. The Guideline's selection criteria will be used to assess the vegetation present as compatible or incompatible, and manage it, if necessary, in a way which meets safety needs in a timely manner, is sensitive to environmental conditions, and enhances cost-effectiveness.	• The presence, density, and location of compatible and incompatible species will be monitored as per the frequency and methodology established in the Bi-Annual Monitoring Program within Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). The Bi-Annual Monitoring Program is made up of pre-treatment and post-treatment monitoring that will be carried out by field survey, by aerial survey, and by high-rail vehicle or train surveys conducted by qualified specialists.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Terrestrial Environment	• Potential for the spread of Emerald Ash Borer, *Agrilus planipennis* (Fairmaire) when removing, handling, and transporting ash trees	Potential effects anticipated	No potential effects anticipated	All Project Components	• Removal of ash trees, or portions of ash trees, will be carried out in compliance with the Canada Food and Inspection Agency Directive D-03-08: Phytosanitary Requirements to Prevent the Introduction into and Spread within Canada of the Emerald Ash Borer (2014), as amended from time to time. To comply with this Directive, ash trees requiring removal, including wood, bark or chips, will be restricted from being transported outside of the emerald ash borer regulated areas of Canada. • Precautions will be taken to reduce the risk of the spread of invasive species by cleaning equipment prior to moving sites.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
	Terrestrial Environment	• Increased erosion and sedimentation	Potential effects anticipated	No potential effects anticipated	All Project Components	• Construction fencing will be installed and maintained to clearly define the construction footprint and prevent accidental damage or intrusion into adjacent designated natural heritage features, vegetation / ecological communities or habitat features. Further, silt fencing will be installed and maintained surrounding any potential watercourses or swales to prevent soil erosion / sedimentation to surrounding sensitive features such as valleylands, watercourses and/or wetland features. • Monitoring of the fencing will be conducted in accordance with the best practices outlined in the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019). The Erosion and Sediment Control Guide for Urban Construction (TRCA 2019) recommends inspections be conducted on a weekly basis at minimum during active construction. Other recommendations for inspections are also outlined in the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019). • As specified in the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019), it is recommended that “damaged ESC measures be repaired and/or replaced within 48 hours or sooner if environmental receptors are at imminent and foreseeable risk of adverse impact”. • An Erosion and Sediment Control Plan, in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA 2019) will be prepared prior to and implemented during construction to reduce the risk of sedimentation to the vegetation communities. • Stockpiled materials or equipment will be stored within the construction footprint but shall be kept at least 30 m away from any watercourse; signs will be put up on site to indicate the setback. • The Environmental Inspector shall possess a Certified Inspector of Sediment and Erosion Control (CISEC) or Certified Professional in Erosion and Sediment Control (CPESC) certificate, and the preparation and implementation of Erosion and Sediment Control Plan(s) shall be in accordance with the Erosion and Sediment Control Guide for Urban Construction (TRCA, 2019).	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. All ESC measures should be inspected weekly. All damaged ESC Measures will be repaired and/or replaced within 48 hours of the inspection. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Terrestrial Environment	• Soil or water contamination as a result of spills (e.g., grease and/or fuel) from equipment use • Introduction or spread of invasive species	Potential effects anticipated	No potential effects anticipated	All Project Components	• A Spill Prevention and Response Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and Spill Prevention and Response Plan. • Refuelling of equipment will occur at least 30 m away from any watercourse. Signs will be put up on site to indicate the 30 m setback from any watercourse. • Refuelling will be done within refuelling stations lined with appropriate material to prevent seepage and fuel discharge. • All machinery, construction equipment and vehicles arriving on site should be in clean condition (e.g., free of fluid leaks, soils containing seeds of plant material from invasive species) and inspected and washed in accordance with the Clean Equipment Protocol for Industry (Halloran et al., 2013) prior to arriving and leaving the construction site. This will reduce the risk of the spread of invasive species to other locations.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include, training for on-site personnel, additional site maintenance and alteration of activities to reduce impacts. • Precautions are being taken to reduce the risk of the spread of invasive species by implementing the Clean Equipment Protocol for Industry (Halloran et al. 2013) on equipment and machinery prior to arriving on a site.
	Terrestrial Environment	• Soil or water contamination as a result of spills (e.g., grease and/or fuel) from equipment use during maintenance activities	No potential effects anticipated	Potential effects anticipated	All Project Components	• A Spill Prevention and Response Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the Spill Prevention and Response Plan. • Refuelling of equipment will occur at least 30 m away from any watercourse. • Refuelling will be done within refuelling stations lined with appropriate material to prevent seepage and fuel discharge. • All machinery, construction equipment and vehicles arriving on site should be in clean condition (e.g., free from fluid leaks, soils containing seeds of plant material from invasive species) and be inspected and washed in accordance with the Clean Equipment Protocol for Industry (Halloran et al. 2013) prior to arriving and leaving the construction site in order to prevent the spread of invasive species to other locations.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
	Wildlife	• Disturbance, displacement, or mortality of wildlife	Potential effects anticipated	Potential effects anticipated	All Project Components	• If wildlife is encountered, measures will be implemented to avoid death, injury, or interference with the species, and its habitat. For example, construction activities will cease, or be reduced, and wildlife will be encouraged to move off-site and away from the construction area on its own. A qualified biologist will be contacted to advise on the appropriate actions for the situation. • Prior to construction, investigation of the Project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken by a qualified biologist, as appropriate. • The contractor will be in adherence with DFO's Code of Practice: Beaver Dam Breaching and Removal.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Wildlife	• Disturbance or destruction of migratory bird nests	Potential effects anticipated	Potential effects anticipated	All Project Components	• All works must comply with the *Migratory Birds Convention Act*, 1994 (MBCA), including timing windows for the nesting period (April 1 to August 31). • Operations will occur outside of the nesting period where feasible. However, if operations or vegetation maintenance must occur during the general nesting period, then a breeding bird and nest survey will be undertaken prior to required activities. Nest searches are required and will be completed by a qualified wildlife biologist or ornithologist no more than 48 hours prior to vegetation removal and no earlier than 7 days prior to the activity. • If a nest of a migratory bird is found outside of this nesting period (including a ground nest), it still receives protection. • If the nest of a bird listed under Schedule 1 of the Migratory Birds Regulations (2022) is found in the Project area, the nest will be registered under the Abandoned Nest Registry. • Three active Barn Swallow nests were observed in one of the culverts associated with Darlington Creek in the Project Footprint, just east of Rundle Road. Nests must be protected (works will not occur that may damage or destroy the nest) between May 1 and August 31 (residency occupancy period).	• Regular monitoring will be undertaken by a qualified biologist to confirm that activities do not encroach into nesting areas or disturb active nesting sites.
	Wildlife	• Decrease of habitat connectivity for wildlife. • Reduction in ecological function, habitat quality and integrity • Removal of/or damage to trees, terrestrial vegetation and wildlife habitat	Potential effects anticipated	No potential effects anticipated	All Project Components	• Opportunities to enhance the natural environment and provide a connection to the surrounding natural areas will be explored, to the extent possible. • Indigenous communities will be invited to provide input to discussions regarding potential habitat connectivity opportunities, as part of vegetation restoration planning.	• Refer to monitoring described for vegetation communities, wildlife and wildlife habitat and aquatic environment.
	Significant Wildlife Habitat	• Disturbance, displacement, or mortality of wildlife or habitat loss for SWH	Potential effects anticipated	No potential effects anticipated	All Project Components	• Prior to construction, investigation of the Project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken, as appropriate. • Mitigation measures specific to SWH for monarchs, turtles, and Eastern Milksnake are provided as separate entries within this table. • Impacts to candidate shrub/early successional bird breeding habitat, candidate terrestrial crayfish habitat and candidate Yellow-banded Bumble Bee habitat can be addressed using the mitigation measures described above in the Vegetation Communities section. Impacts to candidate shrub/early successional bird breeding habitat can also be mitigated using measures outlined below for migratory birds.	• Monitoring activities specific to each SWH are detailed in the wildlife and wildlife habitat sections below, and in the section references for candidate bat maternity colonies, candidate shrub/early successional bird breeding habitat, candidate terrestrial crayfish habitat and candidate Yellow-banded Bumble Bee habitat in the adjacent column.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	Significant Wildlife Habitat	• Disturbance or destruction of habitat used by monarchs	Potential effects anticipated	No potential effects anticipated	GO Station Locations	• Identify opportunities to promote pollinator species and habitat in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). This may include planting or seeding native flowering plants in temporarily disturbed areas. • Opportunities to plant milkweed or forage vegetation outside and within the rail ROW will be considered, where possible, and in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • If vegetation clearing proceeds when monarch larvae may be present (April 1 to September 30), then milkweed plants should be inspected by a qualified professional for monarch larvae prior to their removal. If larvae are present, they may be moved to a location that is suitable and safe under the direction of a qualified biologist. Monarch caterpillars may be moved to other milkweed plants; for other larval stages (i.e., eggs and chrysalis), entire milkweed plants will be transplanted.	• Regular monitoring will be undertaken during construction to prevent unauthorized impacts to habitats used by monarchs.
	Significant Wildlife Habitat	• Potential for impacts to turtles and/or turtle habitat	Potential effects anticipated	No potential effects anticipated	Bridges	• Work within turtle habitat will be planned in consideration of turtle overwintering period which occurs from October 1 to April 30. Mitigation measures to prevent turtles from nesting on site may need to be implemented prior to work activities. • Wildlife exclusionary fencing will be installed and maintained around the construction zone near any potential sensitive herpetofauna habitat such as valleylands, watercourses and/or wetland features. The contract specifications will follow best management practices (MNRF 2013). • The contractor will develop an Amphibian and Reptile Management Plan. • The Amphibian and Reptile Management Plan will be circulated to Indigenous communities for comment. • Fencing designs will be circulated to Indigenous communities for comment. • Post-construction habitat restoration will be implemented, as required.	• Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
	Significant Wildlife Habitat	• Potential for direct impacts to Eastern Milksnake	Potential effects anticipated	No potential effects anticipated	All Project Components	• Snake species, including Eastern Milksnake, have the potential to enter the work area during the active season for snakes (April 1 to October 31) • Mitigation measures for wildlife encounters (as outlined in the Wildlife and Wildlife Habitat section above) will be implemented, as required.	• Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	SAR - General	• Disturbance, displacement, or mortality of SAR or SAR habitat	Potential effects anticipated	No potential effects anticipated	All Project Components	• All requirements of the *Endangered Species Act* (ESA, 2007), Fisheries Act (1985) and *Species at Risk Act, 2002* (SARA) will be met. Species-specific mitigation measures will be implemented based on any recommended surveys undertaken prior to construction, and consultation with MECP and MNRF. MECP will be consulted to confirm permitting requirements under the ESA, 2007. • If SAR is present and a recovery strategy has been developed by MNRF and MECP, Metrolinx will follow the commitments in the recovery strategy. • On-site personnel will be provided with information (e.g., factsheets and training) that addresses the existence of potential SAR on site, the identification of the SAR species and the procedure(s) to follow if an individual is encountered or injured. • Mitigation measures to reduce adverse impacts of Project activities on SAR will comply with the ESA, 2007. • If SAR are encountered, construction activities in the area will cease immediately and a qualified biologist will be contacted. The SAR must be allowed to leave the area on its own accord. Construction activities will not proceed until the SAR is safely away from the area. If the SAR does not leave the area on its own in a timely manner, a qualified biologist with training in proper handling of SAR may be permitted to relocate the SAR safely away from the construction area. • Any SAR individual that is encountered in the Natural Environment Assessment Area must be reported to the MECP (SAROntario@ontario.ca) within 48 hours of the observation. • Prior to construction, investigation of the Project Footprint for SAR that may have established following the completion of previous surveys may be undertaken by a qualified biologist, as appropriate.	• Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional mitigation measures may also be implemented if those proposed are not effective. • Species-specific monitoring activities will be developed in accordance with any registration and permitting requirements under the ESA, 2007. • Monitoring activities to reduce adverse impacts of Project activities on SAR will comply with the ESA, 2007.
	SAR – Bobolink and Eastern Meadowlark	• Habitat loss, disturbance, and/or mortality to Bobolink and Eastern Meadowlark	Potential effects anticipated	No potential effects anticipated	Linear Facilities GO Station Locations	• Additional monitoring, mitigation and compensation for removal of suitable Bobolink and Eastern Meadowlark habitat may be required, based on consultation with the MECP. • Mitigation measures to reduce adverse impacts of Project activities on Bobolink and Eastern Meadowlark will comply with the ESA, 2007. • Disturbance to Bobolink and Eastern Meadowlark habitat will be avoided during the breeding bird window between May 1 to July 31, as per O. Reg. 242/08 of the ESA, 2007.	• Onsite inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on Bobolink and Eastern Meadowlark will comply with the ESA, 2007.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	SAR – Chimney Swift	• Habitat loss, disturbance, and/or mortality to Chimney Swift	Potential effects anticipated	No potential effects anticipated	Bridges	• Additional monitoring, mitigation and compensation for removal of suitable anthropogenic roosting habitat may be required, based on consultation with the MECP. • Mitigation measures to reduce adverse impacts of Project activities on Chimney Swift will comply with the ESA, 2007. • Disturbance to Chimney Swift habitat will be avoided during the active season, which includes breeding, nesting, rearing and roosting, beginning end of April and to the middle of October, as per O. Reg. 242/08 of the ESA, 2007.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on Chimney Swift will comply with the ESA, 2007.
	SAR – Blanding's Turtle	• Potential for impacts to Blanding's Turtle and/or Blanding's Turtle habitat	Potential effects anticipated	No potential effects anticipated	Bridges	• All requirements of the ESA, 2007 will be met. In consultation with the MECP, additional surveys may be required to verify the presence or absence of SAR and confirm permitting requirements under the ESA, 2007. • Work within potential Blanding's Turtle habitat should consider the turtle overwintering period which occurs from October 1 to April 30, and the nesting period which occurs from late May to early July. • Mitigation measures to reduce adverse impacts of Project activities on Blanding's Turtle will comply with the ESA, 2007.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on Blanding's Turtle will comply with the ESA, 2007.
	SAR – Bats	• Habitat loss, disturbance, and/or mortality to SAR bats	Potential effects anticipated	Potential effects anticipated	All Project Components	• All requirements of the ESA, 2007 will be met. In consultation with the MECP, additional surveys may be required to verify the presence or absence of SAR and confirm permitting requirements under the ESA, 2007. • Additional monitoring, mitigation and compensation for removal of suitable treed or anthropogenic roosting habitat may be required, based on the results of additional surveys and consultation with the MECP. • Removal of identified roosting structure/habitat would be discussed in advance with the MECP and requirements of the ESA, 2007 will be met. • Disturbance to bat roosting habitat will be avoided during the bat roosting period of April 1 to September 30, in accordance with MECP requirements. • Mitigation measures to reduce adverse impacts of Project activities on SAR bats will comply with the ESA, 2007.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on SAR bats will comply with the ESA, 2007.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Natural Environment cont.	SAR – Butternut (Tree B-002 has been visually identified as pure. Genetic testing is underway to confirm purity.)	• Habitat loss, disturbance, and/or mortality of butternut	Potential effects anticipated	No potential effects anticipated	Linear Facilities Bridges	• As part of the Arborist Report, trees within or adjacent to the Project Footprint that will be removed or injured as part of the Project will be inventoried, including butternut and other SAR vegetation. SAR vegetation will be subject to permitting and approval requirements under the ESA, 2007, prior to the commencement of construction. • If any works are proposed within the critical root zone (i.e., 25 m radius from stem) or its regulated habitat (i.e., 50 m radius from stem) of a butternut, mitigation, monitoring and compensation to address impacts to butternuts will be required based on the results of a Butternut Health Assessment in accordance with the ESA, 2007. • Each butternut that may potentially be removed or impacted must be assessed by a Butternut Health Expert, in accordance with MECP Butternut Assessment Guidelines (2021e). The Butternut Health Expert will prepare a butternut health assessment report and document the mitigation monitoring and corrective actions implemented. • Mitigation measures to reduce adverse impacts of Project activities on butternut will comply with the ESA, 2007.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on butternut will comply with the ESA, 2007.
	Significant Natural Features	• Localized losses of habitat which may support local wildlife populations and SAR • Reduction in habitat quality resultant from increases in light, noise pollution and dust generation • Potential reduction in habitat quality and Natural Heritage System (NHS) ecosystem resilience related to edge habitat and invasive species introduction and proliferation • Potential reduction in species movement throughout the NHS corridor	Potential effects anticipated	No potential effects anticipated	All Project Components	• Compensatory habitat and mitigation measures including avoidance of invasive species introduction as well as on-going invasive species management will be determined during consultation with agency stakeholders (Municipalities and CLOCA). • The contractor will develop an Invasive Species Management Plan. • The Invasive Species Management Plan will be circulated to Indigenous communities for comment. • Fencing designs will be circulated to Indigenous communities for comment.	• Monitoring restoration areas and follow up management will be determined during consultation with agency stakeholders (Municipalities and CLOCA).

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Tree Inventory	Trees	• Damage to trees during construction, including soil compaction, root damage, and mechanical damage	Potential effects anticipated	No potential effects anticipated	All Project Components	• Trees shall not have any rigging cables or hardware of any sort attached or wrapped around them, nor shall any contaminants be dumped within the protective areas. Furthermore, no contaminants shall be dumped or flushed where they may come into contact with the feeder roots of the trees. In the event that roots from retained trees are exposed, or if it is necessary to remove limbs or portions of trees after construction has commenced, the Project Arborist shall be informed and the proper actions conforming to municipal policies and by-laws shall be carried out. • TPZ fencing will be established to protect and prevent tree injuries in accordance with local by-law requirements. Upon installation of the tree protection fencing, the Contractor shall contact the Project Arborist to review and approve the fencing and its location prior to commencement of any site work. This shall be coordinated with municipal staff for approval. The protection fencing shall remain intact throughout the entire protection. The fencing will be inspected weekly and, if required, repaired. The fencing shall be removed at the completion of all site works. • The TPZ is the area around a retained tree that is to be protected by tree protection fencing. The TPZ is not to be used for any type of storage (e.g., storage of debris, construction material, surplus soils, and construction equipment). No trenching or tunneling for underground services shall be located within the TPZ. Construction equipment shall not be allowed to idle or exhaust within the TPZ.	• On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
	Trees	• Tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• An Arborist Report will be prepared by an ISA Certified Arborist which meets regulatory requirements. The Arborist Report will be completed with regard to Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction)., *Ontario Forestry Act* R.S.O. 1990, the ESA, 2007, and other regulations, municipal by-laws and best management practices as applicable. • The Arborist Report will include, but not be limited to, the individual identification of trees within the Project Footprint, including those that require removal or preservation, or trees that may be injured as a result of the Project. Trees to be identified within the Project Footprint may include those on Metrolinx property, trees on public and private lands, and boundary trees. Municipal by-laws dictate the minimum area buffers to be inventoried and DBH that requires inventory as well as additional requirements for tree inventories and tree protection plans. • The Arborist Report will include all information needed to establish compensation ratios and tree end use (including identification of high value trees) as per Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Prior to the undertaking of tree removals, a Tree Removal Strategy/Preservation Plan, building upon the considerations and elements set out in Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction), will be developed during detailed design to document tree protection and mitigation measures that follow municipal by-laws and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections.	• Regular inspection in areas of vegetation removal will be undertaken as required during construction to confirm that fencing is intact; only specified trees are removed; and no damage is caused to the remaining trees and adjacent vegetation communities. • On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. • If required, the success of vegetation compensation activities will be monitored in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning. • Monitoring requirements will be undertaken in accordance with conditions of permits and approvals.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Tree Inventory cont.	Trees	• Tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2022), and subsequent amendments. Applicable bylaws will be followed. • Metrolinx will adhere to all applicable bylaws and regulations for tree removals outside of Metrolinx properties. • TPZ fencing will be established to protect and prevent tree injuries. TPZs will be clearly staked prior to construction using barriers in accordance with local by-law requirements. • Vegetation restoration and planting plans will be shared with Indigenous communities for feedback. • Upon receiving the necessary Project approvals and prior to the commencement of tree removals, all trees designated for preservation must be flagged in the field. All designated preservation areas must be left standing and undamaged during site works. • Vegetation removal will be avoided and limited to Metrolinx properties and ROW to the extent possible. • Vegetation removals will also consider and mitigate potential impacts to sensitive species, e.g., migratory birds and SAR, and features, e.g., designated natural areas and SWH. Refer to the mitigation measures for the Wildlife, SWH and SAR Environmental Components described above. • Removals are to be completed outside of migratory bird nesting season from, approximately, April 1 to August 31. Removals may take place during this restricted time only if the requirements of the MBCA are met and nesting activity is routinely monitored by qualified individuals (i.e., Wildlife Biologists). • The following is the process that shall be carried out if tree removals are requested during the restricted time indicated in the MBCA: - Contact a qualified individual (i.e., wildlife biologist or ornithologist) to determine if nesting birds are within the tree removal disturbance area. Nest searches are required and will be completed by a qualified wildlife biologist or ornithologist no more than 48 hours prior to vegetation removal and no earlier than 7 days prior to the activity. - If the wildlife biologist / ornithologist has determined that there are nesting birds onsite, there will be no tree removals/chipping conducted within the boundary set out by the specialist. Tree removals can resume within this area at the end of the nesting season, August 31, or if the wildlife biologist / ornithologist has determined the birds have left the nest. - If the wildlife biologist / ornithologist determines there are no migratory birds nesting within the disturbance area, the Contractor has 7 days to conduct removals. At the end of 7 days, if removals and chipping is not complete, the wildlife biologist / ornithologist will return to the site and proceed with another assessment. If there are still no birds, work can resume for another 7 days. This process will continue until all removals and chipping is complete.	• Monitoring and management of trees/vegetation within the rail corridor ROW will be undertaken in accordance with the IVM Program.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Tree Inventory cont.	Trees cont.	• Tree removal	Potential effects anticipated	No potential effects anticipated	All Project Components	• Upon completion of the tree removals, all felled trees are to be removed from the site. No lumber or brush from the clearing is to be stored on the site. Any chipping, cutting or brush cleanup are to be completed outside of the bird nesting season. These works may take place during this restricted time only if the requirements of the MBCA are met and nesting activity is routinely monitored by qualified individuals (i.e., wildlife biologists or ornithologists).	
Geology and Groundwater	Landforms and Physiography	• No effects to landforms or physiographic environmental components are anticipated as a result of construction activities or during operations.	No potential effects anticipated	No potential effects anticipated	All Project Components	• As no effects are anticipated, no mitigation measures are required.	• No monitoring activities are required.
	Soils	• Construction activities could expose contaminated materials and/or result in the spreading of contaminated materials	Potential effects anticipated	No potential effects anticipated	All Project Components	• Develop a Soil and Excavated Materials Management Plan (SEMMP) during Detailed Design for the handling, management and disposal of all excavated material (i.e., soil, rock and waste) that is generated or encountered during the Works. The plan will be overseen by a Qualified Person (QP) pursuant to O. Reg. 153/04 under the *Environmental Protection Act* and will comply with O. Reg. 406/19 (On-Site and Excess Soil Management), the MECP, formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices, (MECP 2021b) and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. • Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per O. Reg. 347 (as amended) and All Applicable Law. • The SEMMP will be reviewed and approved by Metrolinx prior to construction.	• A Soil and Excavated Material Monthly Monitoring Report will be submitted by the Constructor for Metrolinx review on a monthly basis that includes monitoring and performance data related to the management of excavated materials. • Upon completion of the work, the Constructor will submit a Soil and Excavated Material Management Implementation Report to Metrolinx

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Geology and Groundwater cont.	Groundwater Resources	• Construction could expose groundwater associated contamination	Potential effects anticipated	No potential effects anticipated	GO Station Locations Bridges	• Develop a Groundwater Management and Dewatering Plan (GMDP) during Detailed Design to guide the handling, management, and disposal of groundwater encountered during the Works. The GMDP will be overseen by a QP and will comply with O. Reg. 406/19 (On-Site and Excess Soil Management), 64/16 and 387/04, as amended under the *Ontario Water Resources Act*. • The GMDP will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the Works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMDP will outline general groundwater monitoring considerations during the Works and provide guidance for groundwater monitoring following the Works where considered applicable. • The GMDP will describe the anticipated groundwater quantity and dewatering Zone of Influence (ZOI) that will be encountered during the Works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) from the MECP, or an Environmental Activity and Sector Registry (EASR). • The GMDP will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the Works, and approvals for the water disposal, and or treatment if applicable based on the quantity and quality. • The GMDP will be reviewed and approved by Metrolinx prior to construction. • Potential impacts to groundwater-dependent natural features and/or private groundwater supply wells (if present) can be mitigated with measures such as avoidance of dewatering requirements, minimizing dewatering, and/or utilizing groundwater cut-off techniques to physically exclude groundwater from flowing into excavations advanced for construction.	• A Groundwater Management Monthly Dashboard Report will be developed by the Constructor for Metrolinx review to document performance monitoring data/results and any corrective actions implemented during the previous month. • Upon completion of the work, the Constructor will submit a Groundwater Management and Dewatering Implementation Report to Metrolinx.
	Groundwater Resources	• Accidental spills and releases during construction activities may affect groundwater through contamination	Potential effects anticipated	No potential effects anticipated	All Project Components	• A Spill Prevention and Response Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the response plan. • Refuelling of equipment will occur at least 30 m away from any watercourse. • Refuelling will be done within refuelling stations lined with appropriate material to prevent seepage and fuel discharge. • All machinery, construction equipment and vehicles arriving on site should be in clean condition (e.g., free from fluid leaks, soils containing seeds of plant material from invasive species) and be inspected and washed in accordance with the Clean Equipment Protocol for Industry (Halloran et al. 2013) prior to arriving and leaving the construction site in order to prevent the spread of invasive species to other locations.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Stormwater Management	SWM	• The proposed construction activities pose a potential impact due to sediment transport into adjacent natural areas including watercourses, wetlands and municipal drainage infrastructure • The proposed works may result in increases to impervious areas, with potential effects to water quantity and quality • In addition to the increases in impervious coverage, there may be alterations to the local drainage system, both overland (major drainage system) and storm sewers (minor drainage system)	Potential effects anticipated	Potential effects anticipated	All Project Components	• Prepare and implement a Drainage and SWM Report, an Erosion and Sediment Control Plan, detailed drainage design and ESC drawings in accordance with the MECP Stormwater Management Planning and Design Manual (2003), the Toronto and Region Conservation Area's Erosion and Sediment Control Guideline for Urban Construction (2019), as amended from time to time, the MECP Low Impact Development Stormwater Management Guidance Manual (draft) (2022) and the guidelines and regulatory requirements of CLOCA. • The following stormwater management best management practices will be considered and implemented, as required: - Reduce clearing and amount of exposed soil; - Install key sediment control before grading/land alterations begin; - Sequence construction activities so that the soil is not exposed for long periods of times; - Protect storm drain inlets to filter out debris; and, - Stabilize all exposed soil areas as soon as land alterations have been completed. • The overall stormwater quality and quantity control strategy will be developed in accordance with all relevant municipal, provincial and federal requirements, as amended, as well as the requirements of Conservation Authorities having jurisdiction. • A detailed assessment of proposed ditches along the rail corridor is required to provide adequate drainage conveyance in accordance with municipal requirements, Metrolinx Standards and American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering (latest revision). • Infiltration requirements will be determined as per the applicable municipal, provincial, and CLOCA design guidelines and standards. • Any proposed bridges and culvert replacements will be sized to maintain or improve local flood levels and supported by hydrologic/hydraulic calculations and/or models. Creek bed and banks design will include geomorphological input for scour and erosion prevention, and creation of appropriate fish habitat. • A hydraulic assessment of each crossing and any proposed bridges is required to determine proposed flood levels and associated creek bed and bank treatments to prevent scour and erosion and facilitate fish passage. Where applicable, the regulatory model(s) will be obtained from the local Conservation Authority to assess the hydraulic impacts along regulated watercourses. • Develop and implement a Spill Prevention and Response Plan in accordance with the Project Agreement. • The Project will be designed and constructed in accordance with hydraulic assessment recommendations to manage the potential for adverse impacts on existing flood hazards and risks.	• Plans to be developed and implemented include: – Stormwater Management & Drainage Design Report – Erosion and Sediment Control Plan – Spill Prevention and Response Plan • Monitoring activities will be implemented as outlined in the Stormwater Management Plan and/or Erosion and Sediment Control Plan and may include regular inspections and reporting on the performance of implemented ESC measures, best management practices, and other monitoring activities, as required. • All monitoring procedures should stay in place throughout construction. • Turbidity levels within discharges from sites to be monitored visually. Turbidity levels will be monitored upstream and downstream of sites at watercourse crossings or adjacent to watercourses. The turbidity levels within site discharges and receiving storm sewers will also be monitored visually to determine potential impacts from construction. • Grab samples for existing watercourses and/or wetlands, when runoff from the site discharges to a watercourse and/or wetland will be conducted for pre-construction, during construction, and post construction conditions until the site is considered stabilized. Grab samples for watercourses and wetlands will be taken for non-precipitation event and for precipitation events to obtain a reasonable understanding of the turbidity levels. Post-construction monitoring of wetland areas may be required depending on input from Conservation Authorities. • Monitoring will be conducted for potential oil spills and containment of spills to be conducted as per provincial requirements. • Functionality of stormwater quantity controls including peak flows and water levels for storm events within the design range. Monitoring would require local rainfall data.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Stormwater Management cont.	SWM cont.	• The proposed construction activities pose a potential impact due to sediment transport into adjacent natural areas including watercourses, wetlands and municipal drainage infrastructure • The proposed works may result in increases to impervious areas, with potential effects to water quantity and quality • In addition to the increases in impervious coverage, there may be alterations to the local drainage system, both overland (major drainage system) and storm sewers (minor drainage system)	Potential effects anticipated	Potential effects anticipated	All Project Components		• Infiltration targets, measured by flow monitoring on infiltrative Low Impact Development (LID) Best Management Practices (BMP). • Stormwater quality measures will be assessed to provide a minimum 80% Total Suspended Solids (TSS) removal as per the MECP Stormwater Management
	Floodplain	• Potential to impact flooding conditions in the CLOCA Regulatory Floodplain • Potential for flooding impacts on-site during construction	Potential effects anticipated	No potential effects anticipated	Linear Facilities Bridges	• Floodplain impact assessment will be conducted during detailed design following CLOCA guidelines once details on the pier configuration and other detailed bridge design information are available. Design optimizations on abutment, pier, and embankment placement shall be considered to reduce hydraulic impacts. • CLOCA staff will be consulted during detailed design to avoid potential infrastructure conflicts and impacts to flood protection measures/initiatives. • In addition, all necessary studies such as fluvial geomorphic process studies, meander belt and erosion studies, and geotechnical and slope stability assessments will be completed. • Prior to construction, develop a Flood Contingency Plan with specific mitigation measures for any proposed works or temporary laydown and staging areas, as required. The Flood Contingency Plan may include risk mapping, and a monitoring strategy. • Include construction site on CLOCA flood warning system to prepare site in advance of possible flood events.	• Develop and undertake a monitoring program of the Floodplain, as required, in consultation with CLOCA. • Include a monitoring strategy in the Flood Contingency Plan to monitor surface water levels during construction activities.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Air Quality	Air Quality	• Construction-related air pollution (such as dust emissions, tailpipe emissions, and emissions from exposing contaminated materials) may pose risks to human health and wellbeing	Potential effects anticipated	No potential effects anticipated	All Project Components	• Prior to commencement of construction, develop and submit a detailed Construction Air Quality Management Plan (AQMP) to Metrolinx. Implement the AQMP after receipt of approval from Metrolinx. The AQMP will: – Identify specific AQ objectives relevant to the Project identified in AQ Technical Report (Appendix A3) and as outlined in the Metrolinx Environmental Guide for Air Quality and Greenhouse Gas Emissions Assessment (2019). – Define the Project's AQ impact zone and identify all sensitive/critical receptors within this area. – Include requirements for assessing baseline AQ by continuous measurement of local ambient concentrations of PM2.5 and PM10 over a minimum period of one week, for locations where large local sources of pollution (such as highways), directly affect AQ in the zone of influence of the Project. – Estimate and document the predictable worst-case AQ impacts of the Project on sensitive/critical receptors within the AQ impact zone, develop appropriate mitigation measures for each relevant construction activity, describe how to record and demonstrate their effectiveness, and commit to their timely implementation. – Include requirements for continuously monitoring $PM_{2.5}$ and PM_{10} and for monitoring any other contaminant that is predicted to exceed its relevant AQ objective during any phase of the Project and at any receptor (utilizing continuous monitoring where available or non-continuous monitoring otherwise). – Establish specific protocols for action items when relevant AQ objectives are exceeded, including an investigation procedure when exceedances are identified, determining mitigation measures and timeframes for their implementation. – Specify reporting requirements and timeframes, including reporting any exceedance of a continuously monitored ambient AQ objective at any location to Metrolinx within a one hour (or a timeframe established in AQMP) of the occurrence; reporting an exceedance of a non-continuously monitored contaminant within 24-hrs of receipt of the data. – Establish specific protocols for documenting, reporting and addressing public complaints. – Establish a communication protocol with nearby sensitive/critical receptors to provide alerts when monitoring indicates that air contaminant concentrations may be elevated for a prolonged period of time (e.g., over 8 hrs), and also provide guidance on methods to limit exposure (e.g., remaining indoors with windows closed during periods of adverse AQ, confirm Heating, Ventilation, and Air-Conditioning System (HVAC) systems are maintained following manufacturer's recommendations, etc.). – Include an explicit commitment to the implementation of the applicable best practices identified in the Environment Canada document, Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities (2005).	• Develop and submit to Metrolinx for approval a template for Weekly Air Quality Monitoring Reports (WAQMR). Implement the WAQMR after receipt of approval from Metrolinx and start of construction. The WAQMR will document how AQ monitoring has been conducted and compliance assessed to effectively prevent unacceptable rates of air emissions in accordance with the following considerations: – The construction related air contaminants of primary concern are in the form of particulate matter, with the principal construction related fractions of $PM_{2.5}$ and PM_{10} - particulate matter of less than 2.5 and 10 micron in diameter, respectively. Other contaminants of concern include crystalline silica and oxides of nitrogen. The list of contaminants will be expanded with any and all air pollutants that may be produced as a result of the work. – Criteria for $PM_{2.5}$, PM_{10} and crystalline silica are provided in Metrolinx's Environmental Guide for Air Quality and Greenhouse Gas Emissions Assessment (2019). The other applicable objectives for air contaminants of interest include the Ambient Air Quality Criteria (AAQC) and Canadian Ambient Air Quality Standards (CAAQS). • The WAQMR shall include: - Planned construction activities - Daily documentation of weather forecasts, and any AQ Health Index / Special AQ Statements/ Smog and Air Health Advisory issued by Environment and Climate Change Canada (ECCC) or MECP - Measured wind conditions by an on-site meteorological station

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Air Quality cont.	Air Quality	• Construction-related air pollution (such as dust emissions, tailpipe emissions, and emissions from exposing contaminated materials) may pose risks to human health and wellbeing	Potential effects anticipated	No potential effects anticipated	All Project Components	• Prior to construction, identify all adjacent critical receptors (e.g., hospitals, senior's residences, day care facilities, schools, residences) that may be impacted by construction-related air emissions. • Prior to construction, re-assess the assumptions of the AQ Technical Report (Appendix A3), and select methods, operations, materials and equipment to meet applicable AQ Objectives and mitigation thresholds. Plan the layout of construction sites, including access roads, site entrances/exits, staging and laydown areas to limit AQ impacts at adjacent sensitive/critical receptors. • In addition to the mitigation measures outlined above, implement the more detailed mitigation measures recommended in the AQ Technical Report (Appendix A3).	• Documentation of observations of on-site activities and conditions, monitoring activities, any exceedances of applicable AQ objectives and mitigation thresholds, remedial actions / mitigation measures as well as observations after implementation of mitigation measures. • Siting of the air quality monitors should generally follow the guidelines provided in the MECP Operations Manual for Air Quality Monitoring in Ontario (2018) as much as practicable. For pre-construction, only one location needs to be monitored to establish baseline AQ levels. During construction, ideally a minimum of two monitoring locations should be used, one located upwind to assess background concentrations and one located downwind of the active construction zone. • In addition to the monitoring outlined above, implement the more detailed monitoring activities recommended in the AQ Technical Report (Appendix A3).
	Air Quality	• Air quality impacts from operations may pose risks to human health and wellbeing. Potential air quality impacts could include effects from fuel combustion equipment at GO stations, train operations and maintenance activities	No potential effects anticipated	Potential effects anticipated	Linear Facilities GO Station Locations	• Air approvals should be obtained for the GO station operations and air emission sources as applicable. Significant emissions from the GO station should be assessed and modelled following MECP guidance and must comply with applicable Ontario Regulation 419/05 standards. • A detailed Operations Air Quality Management Plan should be developed to document the controls and methods that Metrolinx will implement during project operations to limit the generation and dispersion of airborne particulate matter and air contaminants associated with the Project operations. • Where practicable, the following mitigation measures should be implemented to reduce air contaminant emissions from train and GO station operations: - Selecting a less polluting form of energy or fuel (i.e., electricity or hydrogen rather than diesel fuel) for equipment used at the GO station. - Selecting equipment (such as backup generators and locomotives) with engines and propulsion systems that meet higher emission standards, meaning lower emissions (i.e., Tier 4 rather than a lower tier). - When selecting new train fleet, consider designs that reduce/limit non-exhaust particulate emissions, such as automatic train control/braking systems, wheel and track materials and design, optimizing the wheel profile and applying friction modifiers on wheels or rails to decrease wear particles, choice of brake pad materials. - Maintaining engines and emission control equipment to manufacturers' specifications.	• On-site inspections should be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. • The expected impacts from operations should be effectively mitigated provided that mitigation measures established in the Air Quality Management Plan are followed. Ambient air quality monitoring is not expected to be required. • Weekly Air Quality Monitoring Reports will be prepared to manage air emissions.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Air Quality cont.	Air Quality cont.	• Air quality impacts from operations may pose risks to human health and wellbeing. Potential air quality impacts could include effects from fuel combustion equipment at GO stations, train operations and maintenance activities	No potential effects anticipated	Potential effects anticipated	Linear Facilities GO Station Locations	- Preventive maintenance programs to check that materials and equipment remain in a state of good repair. • Procedures to respond to employee or passenger concerns should be developed and implemented. • Explore planting of trees and vegetation in areas where highest dust impacts are expected.	
Noise and Vibration	Construction Noise	• Environmental noise may cause disturbance and/or annoyance. • The severity of the noise effects resulting from construction projects varies, depending on: - Scale, location and complexity of the project - Construction methods, processes and equipment deployed - Total duration of construction near sensitive noise receptors - Construction activity periods (days, hours, time period) – Number and proximity of noise-sensitive sites to construction area(s)	Potential effects anticipated	No potential effects anticipated	All Project Components	• Nearby sensitive receptors will be notified of construction activities anticipated to create noise disturbance prior to commencement of the activities. • Noise emissions of the construction equipment should be reviewed during detailed design to confirm that they are within the NPC-115 and NPC-118 limits. If they are expected to exceed the limits, quieter equipment should be considered for the Project. Alternatively, noise control options, such as silencers/mufflers should be investigated and implemented for specific equipment. • If the minimum setback distances outlined in the Noise and Vibration Technical Report (Appendix A4) cannot be maintained during the Project construction, temporary noise barriers for construction hoarding should be considered where feasible as primary means of construction noise mitigation for the Project. • Noise shrouds for piling should be considered for the bridge construction where the receptors are within the ZOI established (refer to Table 6.2 of the Noise and Vibration Technical Report (Appendix A4) for a list of ZOIs). Noise shrouds should have a minimum noise reduction of 10 dB. Vibratory/sonic or auger piling may be considered as alternate piling option. • Where noise barriers are used, the barriers should break line-of-sight between the construction equipment and the receptors, should have a minimum surface density (mass per unit of face area) of 20 kg/m^2 (4 lb/ft^2) or an acoustic performance of STC 32 (per CSA-Z107.9-00), and be free of gaps and cracks. It is preferable that barriers are absorptive on the construction side. • Prior to commencement of construction, develop and submit a detailed Construction Noise and Vibration Management Plan based on the actual equipment sound levels and their locations. • The Construction Noise and Vibration Management Plan shall: • Document and commit to all measures to be taken for meeting the noise exposure limits documented in the Metrolinx Environmental Guide of Noise and Vibration Impact Study (2019b) at every directly exposed sensitive receptor and throughout the entire project.	• The Construction Noise and Vibration Management Plan shall incorporate the following requirements related to monitoring of noise and noise related complaints: – Monitor noise where the Construction Noise and Vibration Management Plan indicates that noise exposure limits may be exceeded. At these locations, monitor noise continuously at each geographically distinct, active construction site with one monitor located strategically to capture the highest exposure level based on planned construction activities and the number, geographic distribution and proximity of noise sensitive receptors. – Develop weekly reports describing the monitoring conducted and summarizing the data collected for the reporting period. The reports will include but not be limited to the number and duration of any incident during which any of the noise exposure limits documented in the Metrolinx *Guide for Noise and Vibration Assessment* (2019c) were exceeded, the probable cause of each exceedance, the incident-specific measure(s) implemented, the resulting mitigated noise levels and the complaints investigation procedure.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Noise and Vibration cont.	Construction Noise cont.	• Environmental noise may cause disturbance and/or annoyance. • The severity of the noise effects resulting from construction projects varies, depending on: - Scale, location and complexity of the project - Construction methods, processes and equipment deployed - Total duration of construction near sensitive noise receptors - Construction activity periods (days, hours, time period) • Number and proximity of noise-sensitive sites to construction area(s)	Potential effects anticipated	No potential effects anticipated	All Project Components	• Determine the ZOI for construction related noise based on the noise exposure limits outlined in the Metrolinx Guide for Noise and Vibration Assessment (2019b) and taking into consideration the construction site, staging and laydown sites and hauling routes, each stage of the construction (including demolition), the overall construction schedule along with the schedule of each major component and associated major construction processes and equipment usage. • Identify all sensitive receptors that fall within the ZOI for construction related noise. Mitigation measures will be proposed for these sensitive receptors, and the effects of the proposed mitigation measures will then be evaluated using noise modelling. If results of the modelling indicate that any sensitive receptors still remain within the Zone of Influence for construction related noise, then the following shall apply: • Additional mitigation such as noise wall in place of construction hoarding and construction operational changes are recommended and subsequently modelled until the sensitive receptor does not fall within the ZOI; or • If mitigation strategies are not viable, receptor-based mitigation will be proposed.	- Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.
	Construction Vibration	• Exposure to vibration may result in public annoyance and complaints. Vibration may also cause damage to buildings and other structures	Potential effects anticipated	No potential effects anticipated	All Project Components	• The potential vibration effects from construction equipment can be controlled by increasing the setback distance. Therefore, construction operational changes (e.g., maintaining setback distance and switching to lesser impactful equipment, etc.) are recommended. The owners of the properties within the ZOIs should be notified at least a week (preferably earlier) in advance before of commencing any nearby construction activities commencing. • Develop and implement a detailed Construction Noise and Vibration Management Plan for Metrolinx review and approval with minimum requirements outlined below: - Complete a detailed construction related vibration assessment prior to the commencement of construction that includes assessment of the vibration ZOI. - Complete pre-construction condition surveys for properties within the vibration ZOI of the planned work prior to beginning of any work.	• The Construction Noise and Vibration Management Plan shall incorporate the following requirements related to monitoring of vibration and vibration related complaints: - Monitor vibration continuously at structures where the Construction Noise and Vibration Management Plan indicates that structures are deemed to be within the ZOI for construction related vibration or at additional structures as requested by Metrolinx.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Noise and Vibration cont.	Construction Vibration	• Exposure to vibration may result in public annoyance and complaints. Vibration may also cause damage to buildings and other structures	Potential effects anticipated	No potential effects anticipated	All Project Components	• Identify any heritage structures and other sensitive structures, buildings or infrastructure vulnerable to vibration damage, assess requirements and, if necessary, develop mitigation measures. • Select construction/maintenance methods and equipment with the least vibration impacts. • In the presence of persistent complaints and subject to the results of a field investigation, identify alternative vibration control measures, where reasonably available. • The owners of properties within the Zone of Influence will be notified in advance of construction activities. • Construction planning such as maintaining setback distance and switching to less impactful equipment are recommended.	- The type of Vibration Monitoring Program that is established is based on the vibration ZOI, the project location, duration, presence of nighttime activity, and receptor proximity. The monitoring types include: o Type 1: Monitoring continuously throughout the project (for receptors within the ZOI). o Type 2: Monitoring during most impactful phases of the project only (for receptors outside of the ZOI Influence but within 50 m of the boundary of the construction site). o Type 3: Monitoring in response to complaints only (for receptors outside of the ZOI and beyond 50 m of the boundary of the construction site). • Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.
	Operational Noise (Trains)	• Environmental noise may cause annoyance, disturb sleep, and disturb other activities. • Project noise from operations may be a concern for the receptors within the Noise and Vibration Assessment Area	No potential effects anticipated	Potential effects anticipated	Linear Facilities GO Station Locations	• Trains are expected to stop and/or move at a reduced speed near the GO Station associated with the Fox Street (B1 Thornton's Corners East) GO Station. Curved portion of the track at this location should be designed and maintained with track lubrication to reduce or eliminate squeal noise from curved rail. • Six noise barriers are recommended along various portions of the rail corridor and in proximity to GO Stations B1, B2, B3, and B4 and where feasible. • Locomotives should be positioned at the east end of trains station at the Bowmanville Avenue (B4 Bowmanville) GO Station layover facility. • The north surface of Noise Barrier B (located on the south side of the rail corridor from approximately from Wilson Road South to Farewell Street) to be of an acoustically absorptive finish. • Mitigation to reduce operational noise generated by layover activities at POR093 is not feasible given the proposed development is a 25-storey high-rise building overlooking the proposed layover yard. No other feasible at-source mitigation measures were identified. There may be at-receptor mitigation measures that could be considered during the detailed design phase of the Project and during the land use planning and approval process for this development.	• Establish a Complaints Protocol to respond to issues related to POR083 and POR084.
	Vibration	• Vibration can cause disturbance and/or annoyance	No potential effects anticipated	Potential effects anticipated	Linear Facilities	• Ballast mats or other feasible mitigation measures are recommended to mitigate the impact of operational vibration at the dwellings represented by PORs 009, 014, 031, 402, 043 and 047 (refer to Appendix A4 for POR locations).	• Vibration monitoring is not required for Project operations.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Socio-Economic and Land Use Characteristics	Property	• Property acquisition – permanent and temporary	Potential effects anticipated	No potential effects anticipated	Linear Facilities	• Specific property requirements will be confirmed during design. Where access to property is required, ongoing consultation with affected landowners will help identify appropriate site-specific mitigation measures. • Select staging/laydown areas in accordance with Metrolinx procedures. Staging/laydown areas should be located in areas that limit adverse effects to sensitive receptors.	• None anticipated at this time.
	All land uses and adjacent lands	• Nuisance effects from construction activities	Potential effects anticipated	No potential effects anticipated	All Project Components	• Mitigation measures related to potential nuisance effects related to air and noise are outlined in the AQ and Noise and Vibration Assessments, which are provided under separate cover. • An Erosion and Sediment Control Plan will be developed in accordance with the Toronto and Region Conservation Area's Erosion and Sediment Control Guideline for Urban Construction (2019), as amended from time to time, that addresses sediment release to adjacent properties and roadways. • Develop a Communications Protocol in accordance with the Project Agreement, which will indicate how and when surrounding property owners and tenants will be informed of anticipated upcoming construction works, including work at night, if any. • Develop a Complaints Protocol in accordance with the Project Agreement.	• When applicable, monitoring related to potential nuisance effects are outlined in the AQ and Noise and Vibration above. • Erosion and sediment control monitoring to be conducted as per the Project Agreement. • Number and resolution of complaints received.
	All land uses and adjacent lands	• Land use and access disruption	Potential effects anticipated	No potential effects anticipated	All Project Components	• Provide well connected, clearly delineated, and appropriately signed walkways and cycling route options, with clearly marked detours where required. • Provide temporary lighting and wayfinding signs and cues for navigation around the construction site. • Develop a plan to reduce the effects of light pollution in accordance with the Project Agreement. • Access to nearby land uses will be maintained to the extent feasible for vehicular, pedestrian and cyclist traffic. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur. • Temporary vehicular and pedestrian facilities will comply with accessibility standards.	• Temporary access paths, walkways, cycling routes and fencing should be monitored. • Number and resolution of complaints received.
	All land uses and adjacent lands	• Change in land use	Potential effects anticipated	No potential effects anticipated	GO Station Locations	• A range of municipal permits and approvals may be required for the Project, particularly as pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.	• None anticipated at this time.
	All land uses and adjacent lands	• Access effects related to risk of entrapment or concealment in bridge or tunnel structures	No potential effects anticipated	Potential effects anticipated	Bridges	• Implement Crime Prevention Through Environmental Design principals to address these concerns during detailed design.	• None anticipated at this time.
	All land uses and adjacent lands	• Nuisance effects from operations	No potential effects anticipated	Potential effects anticipated	GO Station Locations	• Develop a Complaints Protocol in accordance with the Project Agreement.	• Number and resolution of complaints received.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Socio-Economic and Land Use Characteristics cont.	Built Form / Visual Characteristics	• Visual effects from construction areas/activities	Potential effects anticipated	No potential effects anticipated	All Project Components	• A screened enclosure for the development site may be provided, with particular attention to the waste disposal and material storage areas. • Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary. • Construction schedule delays will be avoided to the extent possible in order to limit the duration of construction and corresponding visual effects. • Retain existing vegetation to the extent practicable.	• Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified areas.
	Light Pollution	• Light trespass, glare and light pollution effects	Potential effects anticipated	No potential effects anticipated	Bridges GO Station Locations	• Comply with all local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting in areas near or adjacent to highways and roadways regarding outdoor lighting for both permanent and temporary construction activities and incorporate industry best practices provided in ANSI/IES RP-8-18 Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting, as described in the Project Agreement. • The Constructor will perform the Works in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.	• Number and resolution of complaints received.
	Built Form / Visual Characteristics	• Visual effects from new infrastructure	No potential effects anticipated	Potential effects anticipated	All Project Components	• Metrolinx will consider maintenance of vegetation to the extent possible and replanting of vegetation to maintain natural buffers where appropriate and feasible. • Artificial lighting will be incorporated as per applicable lighting standards.	• No monitoring required.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Socio-Economic and Land Use Characteristics cont.	Utilities	• Interference with local utilities	Potential effects anticipated	No potential effects anticipated	Linear Facilities	• Develop and implement a detailed Utility Infrastructure Location Plan that identifies all utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. The Utility Infrastructure Location Plan will be developed in accordance with the Project Agreement. • Additional surveys shall be performed prior to construction to field locate and verify the existing utilities within the project area and document their condition. • Perform all work identified in the Utility Infrastructure Location Plan to protect, support, safeguard, remove, and relocate all Utility Infrastructure. • Obtain permits and consents from and with all Utility Companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and or commissioning of Utility Infrastructure. • Limit impact to the Train Service Plans and to continuity of service and disruption to property owners and customers of the Utility Companies to the satisfaction of the Utility Companies and Metrolinx. • Where new utility crossings are proposed, application for a new utility crossing agreement will be required. Where modifications to an existing utility crossing takes place, updates to an existing utility crossing will be needed.Post- construction inspections of the new utility infrastructure shall be undertaken for applicable works upon completion of the construction works to document condition. • Obtain as-built plans of the relocated infrastructure from utility agencies per as-built preparation standards Canadian Standards Association (CSA) S250-11 – Mapping of Underground Utility Infrastructure (2020), as amended from time to time.	• Maintain regular communication and coordination through issuance of regular progress reports and updates to applicable utility agencies. • Record all installation tolerances and how they are to be monitored. • Perform inspection and testing to check successful utility relocation and safe and efficient installation. • In the event of potential effects to critical utilities, instrumentation and monitoring shall be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities. Develop and implement tracking system for as-built deliverables.
	Utilities	• Relocation or realignment of utilities and retaining walls may impact additional trees and vegetation	Potential effects anticipated	No potential effects anticipated	Linear Facilities	• Any relocation or construction of utilities and retaining walls on City of Oshawa or Municipality of Clarington property may require consultation in order to proceed with tree injury or removal.	• No monitoring required.
	Source Water Protection	• Accidental spills or releases	Potential effects anticipated	Potential effects anticipated	All Project Components	• A Spill Prevention and Response Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the response plan. • The Spill Prevention and Response Plan will identify work areas that fall within vulnerable areas for source water protection (i.e., HVAs and EBAs) • Refuelling of equipment will occur at least 30 m away from any watercourse. • Refuelling will be done within refuelling stations lined with appropriate material to prevent seepage and fuel discharge. • All machinery, construction equipment and vehicles arriving on site should be in clean condition (e.g., free from fluid leaks, soils containing seeds of plant material from invasive species) and be inspected and washed in accordance with the Clean Equipment Protocol for Industry (Halloran et al. 2013) prior to arriving and leaving the construction site in order to prevent the spread of invasive species to other locations.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Socio-Economic and Land Use Characteristics cont.	Source Water Protection	• Contamination from road salt application, handling and storage or road salt and snow storage	No potential effects anticipated	Potential effects anticipated	GO Station Locations	• Winter maintenance activities shall be undertaken by persons who are certified by Smart About Salt, and best management practices for salt and snow shall be implemented.	• On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required.
Traffic and Transportation	Road Network	• Construction may result in the need for temporary road or lane closures	Potential effects anticipated	No potential effects anticipated	Bridges	• Traffic Control and Management Plan(s) will be developed prior to construction to maintain reasonable access through work zones, to the extent possible. • Access to nearby land uses will be maintained for vehicular, pedestrian and cyclist traffic, to the extent feasible. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur. • Temporary vehicular facilities will comply with accessibility and applicable municipal standards. • Construction schedules will be shared with the public in advance of any construction works to reduce traffic during peak hours.	• Pedestrian, cyclist, and vehicular traffic impacts are to be monitored in accordance with a Traffic and Transit Management Plan and adjusted as necessary during the construction period.
	Road Network	• Safety concerns based on additional hazards (i.e., visual distractions, lane restrictions, etc.)	Potential effects anticipated	No potential effects anticipated	Bridges	• Traffic Control and Management Plan(s) will be developed prior to construction to maintain reasonable access through work zones, to the extent possible. • Temporary vehicular facilities will comply with accessibility and applicable municipal standards. • Construction schedules will be shared with the public in advance of any construction works to reduce traffic during peak hours.	• Pedestrian, cyclist, and vehicular traffic impacts are to be monitored in accordance with a Traffic and Transit Management Plan and adjusted as necessary during the construction period.
	Road Network / Transit Network	• Select intersections operate at or close to theoretical capacity • Operations may result delays to bus routes	No potential effects anticipated	Potential effects anticipated	GO Station Locations	• Multi-modal planning and analysis for each proposed station site will be provided at later stages of the Project where further details of the proposed GO stations and their adjacent TOC plans become available in accordance with the municipal planning process and subject to delivery through Metrolinx's TOC Program.	• No monitoring required.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Traffic and Transportation cont.	Transit Network	• Construction will result temporary changes to local bus routes	Potential effects anticipated	No potential effects anticipated	Bridges	• Notify the public in advance of any potential service disruptions. • Consult with local transit agencies to establish a suitable mitigation strategy to be implemented.	• Traffic impacts to be monitored in accordance with the Construction Traffic Control and Management Plan and adjusted as necessary during the construction period.
	Cycling, Pedestrian and Trail Network	• Temporary effects on cyclists/pedestrians such as temporary partial or full sidewalk closures, including increased distance to travel and greater exposure to weather elements	Potential effects anticipated	No potential effects anticipated	Bridges	• Potential effects to pedestrian and cyclist activities during construction will be mitigated through the installation of appropriate wayfinding, regulatory, and warning signs. • Existing sidewalks and crossings will be maintained to the extent possible. • Temporary pedestrian facilities will comply with accessibility and applicable municipal standards.	• Impacts to pedestrians and cyclists are to be monitored in accordance with the Construction Traffic Control and Management Plan and adjusted as necessary during the construction period.
Cultural Environment	Built Heritage Resources	Indirect impacts resulting from vibration damage during construction activities to 17 properties including: • CPR Bridge over CN Tracks, Oshawa (BHR-1) • 33 Avenue Street, Oshawa (BHR-8) • 15 Hall Street, Oshawa (BHR-11) • 394 Simcoe Street South, Oshawa (BHR-16) • 399 Simcoe Street South, Oshawa (BHR-22) • 45 Albany Street, Oshawa (BHR-45) • 435 Albert Street, Oshawa (BHR-71) • 433 Albert Street, Oshawa (BHR-72) • 431 Albert Street, Oshawa (BHR-73) • 371 Albert Street, Oshawa (BHR-74) • 367 Albert Street, Oshawa (BHR-75) • 500 Howard Street, Oshawa (BHR-115)	Potential effects anticipated	No potential effects anticipated	Linear Facilities	• Preferred Option: Avoid the BHR by establishing a buffer zone around the resource. This should use appropriate preventative measures such as mapping of the BHR on construction maps and temporary fencing. Staging and laydown areas should also be selected so that they are non-invasive and avoid the BHR. Where avoidance is not feasible, the alternative option should be applied. • Alternative Option: Where construction activities are anticipated within the buffer zone a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required. • Vibration velocity, or Peak particle velocity (PPV), should be limited to 3 mm/s. • Construction operational changes (e.g., maintaining setback distance and switching to lesser impactful equipment, etc.) are recommended.	• Construction vibration monitoring is recommended for the structures that are expected to exceed the criteria.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Built Heritage Resources cont.	• 356 Ritson Road South, Oshawa (BHR-147) • 464 Ritson Road South, Oshawa (BHR-148) • 470 Ritson Road South, Oshawa (BHR-149) • 349 Ritson Road South, Oshawa (BHR-151) • 393 Wilson Road, Oshawa (BHR-154)					
	Built Heritage Resources	Direct impacts to 500 Howard Street (BHR-115), Oshawa, a Provincial Heritage Property of Provincial Significance, due to the conversion and development of the property into the Front Street (B2 Ritson) GO Station and associated TOC include: • adaptive re-use of the building on site for the Front Street (B2 Ritson) GO Station (and/or associated TOC) that will conserve the heritage attributes of the Provincial Heritage Property of Provincial Significance • demolition of the portion of the building that does not include the heritage attributes of the Provincial Heritage Property of Provincial Significance and construction of the Front Street (B2 Ritson) GO Station	Potential effects anticipated	No potential effects anticipated	GO Station Locations	• In accordance with the *Ontario Heritage Act* and associated Standards & Guidelines for Conservation of Provincial Heritage Properties (MTCS 2010) for this Provincial Heritage Property of Provincial Significance: • Priority will be given to avoiding impacts to the identified heritage attributes. This will be guided by the Strategic Conservation Plan (SCP) that Metrolinx has prepared for the property, as well as Heritage Impact Assessments (HIAs). The following reports will be completed following the TPAP: - Phase I - HIA for the stabilization, protection and mothballing of Part 1 (all heritage attributes are encompassed in Part 1); the identification of all programming needs; the potential full or partial demolition of Part 2; and the potential (partial or complete) transfer of Part 2 out of provincial control. o The HIA for the demolition of Part 2 of the building on the property was completed on April 13, 2023. The demolition of Part 2 received MCM Minister's Consent on May 26, 2023. o If construction of the Front Street (B2 Ritson) GO Station is to occur during this phase (Phase I), an additional HIA will be prepared, to describe all impacts and mitigations. - Phase II – HIA will be completed for the rehabilitation, interpretation and adaptive reuse of Part 1 of the property. If the construction of the new Front Street (B2 Ritson) GO Station was not assessed previously in Phase I, it will be included in this HIA. It will also include the development of the TOC and adaptive reuse of Part 1. To protect the heritage value of Part 1, legally binding protections are required and will be secured through applicable agreements via the TOC program, or as part of a future disposition. A future disposition would be subject to an additional Minister's Consent prior to any demolition, removal, or transfer of any part of the property out of provincial control. • Where construction activities are anticipated within the buffer zone a pre-construction vibration monitoring assessment by a qualified engineer is recommended in order to determine if vibration monitoring is required.	• Not applicable.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Built Heritage Resources	• Direct impact to 500 Howard Street (BHR-115) resulting from tree removal, fence removal and grading would be required along the north edge of the property to provide grading of the 2nd GO Track.	Potential effects anticipated	No potential effects anticipated	GO Station Locations	• Avoid the BHR and any of its heritage attributes but encroachment onto the subject property anticipated. The trees and chain link fence along the north boundary of the subject property would be removed to accommodate grading but would have no impact on any of the identified heritage attributes of the subject property.	• Not applicable.
	Built Heritage Resources	• Potential relocation of Front Street Multi-Use Crossing (Michael Starr Trail) as a bridge or tunnel crossing to the east of the existing crossing location in order to provide an opportunity to connect the Trail to proposed platform(s) of the proposed future Ritson GO Station while maintaining existing multi-use crossing access. Proposed relocated multi-use crossing may encroach onto the north side of 500 Howard Street (BHR-115).	Potential effects anticipated	No potential effects anticipated	GO Station Locations	• Preferred Option: The proposed relocation of Front Street Multi-Use Crossing (Michael Starr Trail) as a bridge or tunnel crossing may be located west of 500 Howard Street and partially within municipal right-of-way with no encroachment on the subject property. Alternative Option: Should the Front Street Multi-Use Crossing (Michael Starr Trail) be relocated to the east of the existing crossing location, there would be anticipated encroachment onto the north boundary of 500 Howard Street during construction and in operation. Heritage attributes located on Part 1 of the property would be not impacted. A Cultural Heritage Risk Management Plan will be developed before work commences to facilitate undertaking proposed work in a manner which mitigates the possibility of impacts to the BHR.	• Not applicable.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Built Heritage Resources	• Direct impact to Albert Street Bridge and Farewell Street Multi-Use Bridge • The MHC made an interim decision that the Albert Street Bridge and Farewell Street Multi-Use Bridge are Provincial Heritage Properties.	Potential effects anticipated	No potential effects anticipated	Bridges	• Removal and/or replacement of the bridges will be completed in accordance with applicable approvals. • CHERs have been completed for both bridges and it has been determined that they both meet criteria contained in O. Reg 9/06 (PHP). • HIAs are being undertaken for both bridges.	• Not applicable.
	Built Heritage Resources	The following 16 properties were found to be within the project footprint and at risk of direct impact due to potential property acquisition or easements: • 83 Avenue Street (BHR-6) • 394 Simcoe Street South (BHR-16) • 399 Simcoe Street South (BHR-22) • 356 Ritson Road South (BHR-147) • 464 Ritson Road South (BHR-148) • 470 Ritson Road South (BHR-149) • 359 Ritson Road South (BHR-150) • 349 Ritson Road South (BHR-151) • 374 Farewell Street (BHR-155)	Potential effects anticipated	No potential effects anticipated	Linear Facilities Bridges	• Priority will be given to avoiding impacts to the identified heritage attributes. • Where possible, design will be refined so that direct property impacts to BHRs are avoided. • CHERs have been completed for all directly impacted BHRs. It has been determined that the following BHRs meet the criteria contained in O. Reg. 9/06 (PHP), and none of the BHRs meet the criteria contained in O. Reg. 10/06 (PHPPS): - 356 Ritson Road South (BHR-147) - 464 Ritson Road South (BHR-148) - St. Wolodymyr and St. Olha Cemetery (BHR-157) - 1598 Baseline Road (BHR-161) - 2228 Baseline Road (BHR-167) - 1766 Baseline Road (BHR-171) • HIAs are being undertaken for 356 Ritson Road South, the St. Wolodymyr and St. Olha Cemetery and 2228 Baseline Road. • HIAs are not required at this time for 464 Ritson Road South, 1598 Baseline Road, and 1766 Baseline Road due to the distance between the proposed undertaking and identified heritage attributes.	• Not applicable.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Built Heritage Resources cont.	• St. Wolodymyr and St. Olha Cemetery (BHR-157) • 1558 Baseline Road (BHR-159) • 1580 Baseline Road (BHR-160) • 1598 Baseline Road (BHR-161) • 2228 Baseline Road (BHR-167) • 1490 Baseline Road (BHR-169) • 1766 Baseline Road (BHR-171)					
	Cultural Heritage Landscapes	Direct impacts to wetlands and watercourses as a result of construction activities, including from: • removal of vegetation communities • disturbance and displacement of wildlife • habitat loss/degradation, soil contamination as a result of possible spills • introduction of invasive species • increased erosion and sedimentation • reduction in ecological activity and integrity	Potential effects anticipated	No potential effects anticipated	All Project Components	• Compensation for tree removals will be undertaken in accordance with provisions outlined in Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Vegetation removal will be reduced to the extent possible and limited to the construction footprint. • Construction fencing and or silt fencing, where appropriate will be installed and maintained to clearly define construction footprint and prevent accidental damage or intrusion to adjacent vegetation or ecological land classification communities. • Provide compensation for removal of vegetation in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Provide compensation for disturbed or removed wetlands based on Metrolinx Guidelines and in consultation with CLOCA. • Temporarily disturbed areas will be re-vegetated using non-invasive, native plantings and/or seed mix, appropriate to the site conditions and adjacent vegetation communities. Seed mixed will be used in conjunction with an appropriate non-invasive cover crop as needed. • Vegetation removals will also consider and mitigate potential impacts to sensitive species and features. • On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required.	• On site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Archaeological Resources	Potential for the disturbance of unassessed or documented archaeological resources	Potential effects anticipated	No potential effects anticipated	All Project Components	• Additional Stage 2 AA work will be undertaken for areas requiring further archaeological assessment as identified in the Stage 1 AA; if required, Stage 3 and 4, where recommended by previous stages will be undertaken by a licensed archaeologist as soon as possible and submitted to MCM for review and entering into the Ontario Public Register of Archaeological Reports. • The Constructor will develop and implement an Archaeological Risk Management Plan that addresses any recommendations resulting from Archaeological Assessments and documents all protocols for the discovery of human remains and undocumented archaeological resources. The Archaeological Risk Management Plan shall be amended to incorporate any additional actions required resulting from subsequent AA Reports and/or subsequent changes to Applicable Law. • All work shall be performed in accordance with Applicable Law, including but not limited to the *Ontario Heritage Act*, 1990 (OHA), the Ministry of Tourism, Culture and Sport (MTCS) *Standards and Guidelines for Consultant Archaeologists* (2011b), and the MTCS document, *Engaging Aboriginal Communities in Archaeology: A Draft Bulletin for Consultant Archaeologists in Ontario* (2011). • In the event that archaeological materials are encountered or suspected of being encountered during construction, all work will cease. The location of the findspot should be protected from impact by employing a buffer in accordance with requirements of the MCM. A professionally licensed archaeologist will be consulted to complete the assessment. If materials are confirmed to possess cultural heritage value/interest then they will be reported to the MCM, and further AA of the materials may be required. If it is determined that there is a potential for Indigenous artifacts, Metrolinx should be contacted, and Applicable Law will be followed. • If final limits of the Project Footprint are altered and fall outside of the assessed area, additional AAs will be conducted by a professionally licensed archaeologist prior to construction activities. This will include completing all required AAs resulting from the Stage 1 AA (Stage 2, Stage 3 and Stage 4, as required) as early as possible. • For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, additional AA will be conducted by a professionally licensed archaeologist prior to disturbance.	• Performance of the work will occur within land previously subject to an Archaeological Assessment. • Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities in the event that an archaeological resource is encountered. • Further archaeological assessment is not recommended for any portion of the Project's anticipated construction which impacts area previously assessed and not recommended for further archaeological work.

Environment	Environmental Component	Potential Effects	Project Phase - Construction	Project Phase - Operations	Project Components	Mitigation Measure(s)	Monitoring Activities
Cultural Environment cont.	Archaeological Resources	Potential for the disturbance of unassessed or documented archaeological resources	Potential effects anticipated	No potential effects anticipated	All Project Components	• If human remains are encountered or suspected of being encountered during project work, all activities must cease immediately and the local police/coroner as well as the Bereavement Authority of Ontario on behalf of the Ministry of Government and Consumer Services must be contacted. Archaeological investigations of human remains will not proceed until police have confirmed the remains are not subject to forensic investigation. Once human remains have been cleared of police concern, the MCM will also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the OHA. If the human remains are determined to be of Indigenous origin, Metrolinx should be contacted, and all applicable law must be adhered to. • All AA findings will be shared with Indigenous communities, as per Metrolinx procedures.	
	Archaeological Resources	Potential to impact portions of the boundary of St. Wolodymyr and St. Olha Ukrainian Cemetery	Potential effects anticipated	No potential effects anticipated	**Linear Facilities**	• The St. Wolodymyr and St. Olha Ukrainian Cemetery property retains archaeological potential for archaeological resources not related to the cemetery, and Stage 2 archaeological assessment is recommended if design cannot be refined to avoid encroachment on this area. • A Cemetery Investigation Authorization issued by the Bereavement Authority of Ontario is required in advance of invasive archaeological fieldwork within the cemetery property. • Parts of the St. Wolodymyr and St. Olha Ukrainian Cemetery contain burials and cemetery investigation is recommended prior to construction impacts in these areas	• Further AA may identify the need for monitoring during construction.

6.0 Climate Change Considerations

This section outlines how climate change considerations were taken into account in the environmental assessment and design of the proposed infrastructure associated with the Project. Specifically, this section describes how the Transit Project Assessment Process (TPAP) incorporates the Ministry of Environment, Conservation and Parks (MECP) guidance for considering climate change in environmental assessments, with a focus on climate change mitigation and adaptation.

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as:

> *"…a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use." (Intergovernmental Panel on Climate Change 2014)*

The term "climate change" can apply to any major variation in temperature, wind patterns or precipitation that occurs over time. Changes in the composition of the atmosphere are resulting in processes that alter global temperature, precipitation, and are affecting local weather patterns. These processes are leading to increased occurrence of extreme weather events such as floods, droughts, ice storms and heat waves across the Greater Golden Horseshoe (GGH) (Metrolinx 2017).

To mitigate climate change and its effects on the natural and built environments, government agencies at all levels have developed strategies and guidelines to reduce Greenhouse Gas (GHG) emissions into the atmosphere. Government agencies are also implementing measures that promote resiliency to a changing climate. Consistent with these strategies and guidelines, the planning and design of this Project will consider both climate change *mitigation* (i.e., limiting effects of a project on climate change) and *adaptation* (i.e., resilience of a project to future climatic conditions).

Section 6.1 outlines the policy context which guides how climate change has been considered in the planning of this Project. Sections 6.2 (mitigation) and 6.3 (adaptation) describe how these considerations are being implemented in Project planning and design. Given the relatively small effects of the transit project on climate change, and Metrolinx's extensive existing guidance on how to build and operate the infrastructure considering future extreme weather events, reference to existing climate change strategies and policies was judged to be sufficient in considering climate change in the TPAP.

6.1 Policy Context

6.1.1 Government of Ontario

The Government of Ontario has committed to reducing GHG emissions to 30% below the 2005 levels by 2030 (i.e., 143 megatonnes (mt) of carbon dioxide equivalent (CO_2e) by 2030) (Government of Ontario 2018).

The *Infrastructure for Jobs and Prosperity Act*, *2015* indicates that infrastructure should be planned to mitigate effects on climate change and be designed to consider climate change adaptation. Specifically, Section 3.11 of this Act states that:

> *"Infrastructure planning and investment should minimize the impact of infrastructure on the environment and respect and help maintain ecological and biological diversity, and infrastructure should be designed to be resilient to the effects of climate change."*

The 2020 Provincial Policy Statement (PPS) (Ministry of Municipal Affairs and Housing 2020) issued under the *Planning Act* advises on the need to consider reducing GHG emissions and reducing the potential risk of climate change-related events like droughts or intense precipitation. It encourages green infrastructure and strengthens stormwater management requirements; energy conservation and efficiency; reduced GHG emissions; climate change adaptation (e.g., tree cover for shade and for carbon sequestration); and consideration of the increased risk associated with natural hazards (e.g., flooding due to severe weather).

Applicability to the Transit Project

Improving the public transit network can reduce traffic congestion and reduce the need for new road infrastructure, as well as reduce carbon emissions and Air Quality (AQ) concerns associated with automobile use, contributing to reductions in GHG emission and helping to achieve provincial targets. Metrolinx is working in alignment with the intent of the *Infrastructure for Jobs and Prosperity Act*, *2015* in the planning and design of the Project.

Since infrastructure proposed by the Project have life spans that have the potential to face significant climatic changes based on conservative climate projections, there is a need to consider both the operational impacts to climate change, as well as how the Project will be affected by future climate change-related events such as droughts or intense precipitation. This includes consideration of most of the aspects highlighted in the PPS, including green infrastructure; stormwater management; energy conservation and efficiency; GHG emissions; vegetation/carbon sequestration; and resiliency to natural hazards such as flooding. Specific measures related to these aspects are further discussed in Sections 6.2 and 6.3.

6.1.2 Ministry of the Environment, Conservation and Parks

The MECP has prepared a guide titled Considering Climate Change in the Environmental Assessment Process (MECP 2017), to describe how environmental assessment processes shall incorporate consideration of climate change impacts, including:

- the effects of a project on climate change
- the effects of climate change on a project
- various means of identifying and minimizing negative effects during project design

Considering climate change in accordance with the guide is meant to result in a project that is more resilient to future changes in climate and helps maintain the ecological integrity of the local environment in the face of a changing climate.

The guide states that proponents should take into account climate change mitigation and adaptation during both the assessment of alternatives to the undertaking and alternative methods of implementing the undertaking. Specific to transit projects assessed under the TPAP, the guide advises that the consideration of climate change should be scaled to the significance of the project's potential environmental effects, and that evaluation can be qualitative and/or quantitative.

Applicability to the Transit Project

The TPAP starts with a selected transit project. Ontario Regulation (O. Reg.) 231/08 does not require proponents to look at the rationale and planning alternatives or alternative solutions to public transit or the rationale and planning alternatives or alternative solutions to the particular transit project (MOECC 2014). The climate change assessment contained in this Environmental Project Report (EPR) focuses on the various design and mitigation measures that will support climate change mitigation and adaptation during operations of the Project.

Since the Project will be operational for the foreseeable future, it will likely be affected by future climate change-related events such as droughts or intense precipitation. As a result, designs, construction and operations should consider the potential for these future events. The Project will continue to take climate change considerations into account as the design progresses beyond the TPAP, advancing from its current conceptual level of design in future Project phases.

Table 6.1 outlines how climate change was considered in this Project. Each of the areas considered is described in greater detail in Sections 6.2 and 6.3.

Table 6.1: Consideration of Climate Change in the Pre-TPAP and TPAP Phases

Consideration	Project Phase	Areas considered	Type of Evaluation
Effects of the Project on climate change (mitigation)	TPAP, detailed design, construction, operations	• Planning for transit	• Qualitative
		• GHG emissions	• Quantitative
		• Vegetation removal and compensation	• Quantitative
		• Energy consumption and emissions	• Qualitative
		• Environmental Management System	• Qualitative
Effects of climate change on the Project (adaptation)	Detailed design, construction, operations	• Air temperature (building materials, solar infiltration, shade, urban heat island effect)	• Qualitative
		• Precipitation (stormwater management, low impact development, erosion and sediment control)	• Qualitative
		• Drought (water reuse/reduction, vegetation)	• Qualitative

Further, Table 6.2 outlines how the primary expectations for proponents when considering climate change according to the MECP's guide (as indicated by "should" statements in the guide) have been addressed in the EPR Addendum.

Table 6.2: Consideration of Climate Change in the EPR Addendum

Recommendation	Section(s)
The MECP expects proponents to take into account: • The project's expected production of greenhouse gas emissions and effects on carbon sinks[25] (climate change mitigation) • Resilience or vulnerability of the undertaking to changing climatic conditions (climate change adaptation)	Section 6.2.2 (greenhouse gas emissions) Section 6.2.3 (effects on carbon sinks) Section 6.3 (climate change adaptation)
The proponent should also include a discrete statement in their study report detailing how climate change was considered in the environmental assessment	Section 6.1.2, Table 6.1
Proponents of natural resource related projects should consult Appendix B for treatment of carbon stocks as sinks versus sources	The transit project is not natural resource related, so this is not applicable
Proponents should include evaluation criteria, such as greenhouse gas emissions and effects on carbon sinks, in the assessment of alternatives and alternative methods	The TPAP does not include an assessment of alternatives or alternative methods, so this is not applicable
In concluding an environmental assessment study, the proponent should also include a statement in their study report about how climate change was considered in the environmental assessment and how the preferred alternative (project) is expected to perform with climate change considered	Section 1.0
Proponents should include evaluation criteria such as extreme weather events in their screening of alternatives, and alternative methods	The TPAP does not include an assessment of alternatives or alternative methods, so this is not applicable
Proponents should also include in their study report, a statement about how climate change was considered in the environmental assessment, specifically in relation to the preferred alternative (project)	The TPAP does not include an assessment of alternatives or alternative methods, so this is not applicable
All climate parameters with potential to interact with a project should be defined and considered at a screening level to fully understand which interactions pose higher risk	Section 6.3, Table 6.3

[25] A carbon sink refers to "the ability of a forest, ocean or other natural environment to absorb carbon dioxide from the atmosphere." (Government of Canada 2021)

Recommendation	Section(s)
Proponents should also document any uncertainty related to either downscaling climate change projections to specific sites, or expected effects to the environment or project, within the environmental assessment	Metrolinx is moving towards using downscaling projections as described in its *Planning for Resiliency* report (Metrolinx 2017) to inform decisions regarding planning, construction and operations of infrastructure. This considers adaptation to climate change across all infrastructure assets, including existing and future stations
Considering climate change in the terms of reference for an environmental assessment should commit the proponent to considering climate change effects in related project studies prepared in support of the environmental assessment report	The TPAP does not include a terms of reference, so this is not applicable
Considering climate change in an environmental assessment should result in the proponent refining and documenting measures for dealing with climate change effects as the undertaking moves toward implementation stage. Examples could include adapted design or maintenance schedules, additional studies, and revised operating procedures	Section 6.3
Considering climate change in streamlined environmental assessment processes and studies could result in the inclusion of a commitment on how the proponent will implement climate change adaptation and mitigation measures during the detailed design phase of any given project	Section 6.2.3 and Section 6.3.2
Proponents should consider whether making reference to existing climate change strategies or policies alone is sufficient as a consideration of climate change, or whether a more detailed consideration of climate change should be carried out when conducting project-specific environmental assessment studies. Documentation of the results of this consideration should be included as part of project reporting	Section 1.0

6.1.3 Metrolinx

Metrolinx's RTP 2041 (Metrolinx 2018b) outlines the long-term projects, plans, and activities Metrolinx will deliver to support reduction of Ontario's overall GHG emissions by promoting a shift from single occupant vehicles to more energy-efficient options such as public transit, walking, cycling, carpooling, and teleworking.

Metrolinx is committed to ensuring that the existing transit network and proposed infrastructure will have a low-carbon footprint[26] and contribute to a clean and healthy environment for future generations (Metrolinx 2016). Metrolinx has outlined key climate change goals in its Sustainability Strategy (2015 – 2020) (Metrolinx 2016). The Sustainability Strategy addresses climate change through five goals, which are:

- **Goal 1**: Become Climate Resilient – Accelerate and intensify our efforts to implement a climate adaptation and resilience program to manage and mitigate climate change risks.
- **Goal 2**: Reduce Energy Use and Emissions – Adopt processes, programs and technologies that allow us to effectively track, monitor and reduce our energy consumption, and carbon and air emissions.
- **Goal 3**: Integrate Sustainability in our Supply Chain – Minimize the impact associated with the use, extraction, processing, transport, maintenance, and disposal of materials and integrate sustainability criteria into our vendor management decisions. This goal extends to consideration of embodied carbon (i.e., the carbon dioxide emitted during the manufacture, transport and construction of materials, together with end of life emissions).
- **Goal 4**: Minimize Impacts on Ecosystems – Consider the impact of infrastructure and services on ecosystems and ecosystem services and make best efforts to manage, preserve and protect. This includes the consideration of infrastructure projects within the broader context of ecosystems and ecological values, including watershed/stormwater management considerations.
- **Goal 5**: Enhance Community Responsibility – Leverage our significant investment in the region to create a lasting legacy for our communities and work closely with communities to create economic and social value.

For GO stations, terminals, and facilities, including this Project, Metrolinx generally requires that contractors adhere to the GO Design Requirements Manual (DRM) (Metrolinx 2020b) and other applicable Metrolinx design standards, including the Metrolinx Sustainable Design Standard. The DRM outlines the Guiding Principles and technical details for designing and building GO station infrastructure (Off Corridor [OffCorr] infrastructure). The DRM covers a number of areas directly and indirectly related to climate change adaptation and mitigation, including stormwater management, energy consumption and emissions, and vegetation. Effort will be made to apply DRM

[26] A carbon footprint is the total greenhouse gas emissions attributed to a body (e.g., person, facility, or event) expressed as carbon dioxide equivalent (CO_2e). CO_2e is a standard unit for measuring carbon footprints, as a way to express the impact of each different greenhouse gas in terms of the amount of CO_2 that would create the same amount of warming.

requirements to the infrastructure components to the maximum extent possible. The Metrolinx Sustainable Design Standard outlines specific design requirements and reporting direction for designing and building projects with capital costs over $100 million or otherwise required by Metrolinx. The Sustainable Design Standard covers a number of areas related to climate vulnerability and risk assessments and stormwater management. Effort will be made to apply Sustainable Design Standard requirements to infrastructure components to the maximum extent possible.

Applicability to the Transit Project

Of the goals identified above, Goals 1, 2 and 4 align most directly with climate change adaptation and mitigation as described in the MECP's guide. Goal 1 is focused on adaptation and has been considered in various aspects of new facilities design. Goal 2 relates to minimizing emissions during operations (mitigation), while Goal 4 focuses on minimizing impacts to ecosystems both during construction and operations (adaptation and mitigation). The following sections outline how project planning and design have been undertaken with regard to climate change mitigation and adaptation.

Goals 3 and 5 more broadly speak to how the construction and operations of the Project can limit environmental impacts as well as maximize social value. These goals are discussed throughout this section.

6.2 Considering the Effects of the Transit Project on Climate Change (Climate Change Mitigation)

As indicated in Table 6.1, the effects of the Project on climate change (mitigation) have been evaluated both quantitatively (for GHG emissions) and qualitatively (for transit planning, vegetation compensation/revegetation, energy consumption/emissions and environmental management systems).

6.2.1 Planning for Transit

Public transportation is a beneficial service that can reduce traffic congestion, the need for new road infrastructure, and carbon emissions and AQ concerns associated with automobile use.

Improvements to transit will decrease average transit trip times in the GGH, even with an increasing population, leading to more people using public transportation and fewer vehicle-kilometres travelled in congested conditions. This reduction in congestion, when combined with expected improvements in automobile fuel efficiency, will result in a decrease in per capita GHG emissions from automobile trips (Metrolinx 2018b).

The Project has been identified for implementation through a comprehensive, iterative planning process for new infrastructure in the GGH. It is anticipated that the introduction of these new tracks and facilities will assist in implementing the planned service increases and thus increasing the use of public transportation, thereby decreasing congestion and improving per capita GHG emissions.

6.2.2 Greenhouse Gas Emissions

Direct (project-related) and indirect (third-party) GHG emissions are estimated for the construction and operation of the Project.

Direct GHG emissions are expected during construction and operation as a result of equipment and vehicles burning hydrocarbon fuel. Direct construction phase emissions are estimated to be 4.1 kilotonnes of carbon dioxide equivalent (kt CO_2e) per year. Direct operation phase emissions are estimated to be 14.7 kt CO_2e/year.

Following implementation of mitigation measures, direct Project contributions to GHG emissions from annual construction and operation are estimated to be:

- 0.001% (construction) and 0.002% (operation) of Canada's total GHG emissions
- 0.003% (construction) and 0.009% (operation) of Ontario's total GHG emissions
- 0.002% (construction) and 0.008% (operation) of the Canadian Transportation sector emission total
- 0.008% (construction) and 0.03% (operation) of the Ontario Transportation sector emission total

Indirect (third-party) GHG emissions from electricity may be released during operation as a result of additional electrical power required to operate the stations and for wayside power. Predicted annual indirect (third-party) electricity operation emissions are estimated to be 0.4 kt CO_2e/year.

The GHGs released by the Project are expected to comprise 0.004% and 0.01% of the Government of Canada's and Province of Ontario's 2030 emission target, respectively.

The implementation of the Project is predicted to reduce the use of private vehicles in and near the Project footprint. Over a 60-year lifecycle, Metrolinx estimates that the Project can result in a reduction of 1.7 billion vehicle kilometers travelled and is equivalent to a reduction of up to 353 kt CO_2e. The reduction is estimated using a Canada specific average fuel consumption emission factor per kilometer travelled for light duty vehicles (International Energy Agency 2019). On an annual basis, the Project can reduce up to 31 million vehicle kilometers traveled which is equivalent to 6.4 kt CO_2e. It is expected that over time, more electric vehicles will be deployed in the area

and the electricity GHG intensity will decline, leading to less GHG savings from the project annually over time.

There is expected to be a small net increase in GHG emissions as a result of the operation of the Project. However, the preliminary GHG emissions are estimated assuming that diesel locomotives will be used for the 60-year lifecycle of the Project which is likely to change over time toward the use of some electrically driven locomotives. This assumption for GHG emissions from the Project is therefore conservative.

6.2.3 Vegetation Compensation and Revegetation

As noted in Sections 4.2 and 4.3, the construction of the new infrastructure will require the removal of trees and vegetation, which will result in a temporary loss of an existing carbon sink within the local environment.

The Metrolinx Vegetation Guideline (Metrolinx 2022, and subsequent updates prior to construction) will be applied to the Project. Vegetation or trees that are removed will be compensated for in accordance with the provisions of this protocol, as follows:

- **For Municipal/Private Trees:** Metrolinx will work with each municipality to develop a municipality-wide streamlined tree permitting/compensation approach for municipal and private trees. The goal is to reduce administrative permitting burden for trees along extended stretches of rail corridor.
- **For Trees Within Metrolinx Property:** Metrolinx is developing a methodology to compensate for trees located within Metrolinx's property. This will involve categorizing trees community types/ecological value and establishing the appropriate level of compensation. Metrolinx will be looking to partner with Conservation Authorities and municipalities to develop the final compensation plan.
- **Conservation Authorities:** For vegetation removals within Conservation Authority regulated areas where required, applicable removal and restoration requirements will be followed.
- **Federal lands**: For vegetation removals within Federally owned lands where required, applicable removal and restoration requirements will be followed.
- **Tree End Use**: Options for the end use of trees removed from Metrolinx property (e.g., reuse/recycling options) will be developed.

Compensation of disturbed areas will take place as soon as possible. Post-planting monitoring of restoration areas will occur for one year after installation. One site visit will be conducted during the subsequent growing season to confirm survival of plantings and/or seed mix. Should the plantings and/or seed mix not survive, additional seeding and/or plantings will be undertaken one year thereafter with one additional monitoring visit in the following growing season.

Additionally, the Metrolinx DRM requires that plant materials suitable to the growing environment at project sites be selected for vegetation/revegetation, and that species (native or non-native) must be hardy, drought and salt-tolerant, and resistant to the stresses of compacted soils and weather exposure.

6.2.4 Energy Consumption and Emissions

To lower the energy consumption and carbon footprint of the proposed infrastructure, the successful Project consortium will be required to explore (sequentially) the following groups of methods for applicability and feasibility: energy efficiency, energy conservation and recovery, and energy harvesting. Examples include:

- **Energy efficiency** – use premium efficiency motors or other equipment; applying passive means of reducing energy where it does not conflict with other operational design requirements, including the use of building materials with high-insulation/energy efficiency value where possible.
- **Energy conservation and recovery** – employ regenerative braking systems to capture energy from braking vehicles; and
- **Energy harvesting** – consider incorporating solar thermal systems, passive solar systems and/or ground source heat pump systems to replace or augment fuel-based systems.

These and other considerations will be developed into an Energy and Emissions Management Plan that will include targets and programs to promote continuous reduction of energy and emissions (both GHG and criteria air contaminant).

6.2.5 Environmental Management System

Metrolinx has developed an Environmental Management System (Env.MS), which outlines an organization-wide framework for pursuing environmental compliance and continuous environmental improvements. The Env.MS, which follows the International Organization for Standardization (ISO) 14001 standard[27], is currently expanding from its operational focus to encompass additional environmental responsibility and stewardship considerations.

The overall objectives of the Metrolinx Sustainability Strategy are reflected in the Env.MS with respect to climate change mitigation, energy use reduction, and air emissions (i.e., GHG) management. Both the construction and operation of the Project will be subject to Metrolinx's Env.MS.

The Env.MS includes:

- environmental standards for managing chemicals, solid waste, regulated waste, bulk storage and fuel handling, water use and disposal, energy use, air emissions, ozone-depleting substances, designated substances and hazardous materials, snow and ice, and wildlife and vegetation
- compliance audits and corrective action planning
- environmental reporting metrics
- monitoring of environmental impacts
- monitoring of energy use and air emissions

Through the use of standards, audits, and reporting, the Env.MS will promote ongoing compliance with regulatory and corporate environmental requirements throughout construction and operations of the Project. Additionally, monitoring of impacts will support ecosystem resilience, consistent with overall Metrolinx sustainability objectives.

Additionally, a Sustainability Plan for the Project will be developed by the successful Project consortium and will be aligned with the Env.MS. Once developed, this Sustainability Plan will be incorporated into the Env.MS to check that the Project maintains environmental compliance and continuous environmental improvement.

[27] ISO 14001 is an international standard that outlines specific requirements for an effective environmental management system. The standard provides a framework suitable for use by an organization, and covers topics such as: Context of the organization, Leadership, Planning, Support, Operation, Performance evaluation, and Improvement.

6.3 Considering Potential Effects of Climate Change on the Transit Project (Climate Change Adaptation)

It is recognized that climate change is already underway and can be anticipated to affect the construction and operations of the Project. There is general agreement that the Great Lakes Basin will see increases in temperature, precipitation, drought, wind gust events, and freezing rain by the end of this century; however, the level of confidence and quality of supporting evidence for these projections vary considerably (Metrolinx 2017). Table 6.3 shows changing climate parameters and predictions for climate change.

Table 6.3: Metrolinx Climate Parameters List: Probability and Scores

Climate Parameter	Threshold	Annual Probability		Prob. Of Occurrence for Period (2015-2050)	PIEVC Scoring		
		Historical	2050s		Annual: Historical	Annual: 2050s	Study Period (35 year)
Extreme Temperatures	40°C	~0.01 per year	1-7 days per year	~100%	1	7	7
	32°C	6.5 days per year	27.5 days per year	1	7	7	7
	-30°C	0.05 days per year	<0.01 days per year	<70%	2	0-1	5-6
	-23°C	1.1 days per year	0.1 days per year	1	7	3	7
Temperature Ranges	60°C in one year	0.1 days per year	<0.01 events per year	<90%	3	0-1	6
Reduced Visibility (e.g., fog, blowing snow)	400 m	49 hrs per year, 15.1 days per year	strong trend↓, stable recent period	1	7	6-7	7
	200 m	33 hrs per year, 11.9 days per year	strong trend ↓, stable recent period	1	7	6-7	7
Frost Penetration	1.2 m or below	0.17 per year	Trend↓ but some conflicting factors	>90%	4	3	6-7
High Winds (Gusts)	90 km/h	2 per year	>2.5 per year	1	7	7	7
	120 km/h	0.05 days per year	Likely ↑	85% or higher	2	2	6-7
Tornadoes	EF1+	1-in-6,000	Unknown	~0.6%	0	0	0-1

Climate Parameter	Threshold	Annual Probability		Prob. Of Occurrence for Period (2015-2050)	PIEVC Scoring		
		Historical	2050s		Annual: Historical	Annual: 2050s	Study Period (35 year)
Overland Flood/ Heavy Rainfall	≥25 mm in 2 hr	~ 0.8 events per year	Very likely ↑	1	6	6	7
	≥60 mm in 2 hrs	≤ 0.03 events or less per year	Very likely ↑	~70%	1-2	2	6
Freezing Rain	≥ 10 mm	~ 0.2 days per year	~ 0.3 days per year	~100%	4	4-5	7
	≥ 25 mm	0.06 days per year	>0.09 days per year	>95%	2	3	7
Snow	Blowing snow	7.8 days per year	Trends not significant to scoring	1	7	7	7
	≥ 20 cm in one day	0.1 days per year	Conflicting trends, likely remaining similar	>95%	3	3	6-7
Hail	“Golf ball” / 45 mm or larger	0.07 per year	Unknown	>90%	2-3	unknown	6
Horizontal Rain	Gusting 50 km/h + >25 mm rain	1.8 days per year	Slight trend ↑	1	7	7	7
Lightning	Direct strikes	~ 0.3% per year	Likely ↑	>99%	1	unknown	3

To focus the consideration of effects of climate change on the Project, only those themes where there is high or medium agreement on data are addressed in the sections below, for both the construction and operations phases of the Project.

6.3.1 Air Temperature

Recognizing increasing summer temperatures, the DRM considers reducing effects of extreme heat on all Metrolinx assets. It should be noted that DRM requirements may not be applicable for all of the different infrastructure components. The DRM indicates that new GO infrastructure designs will:

- Consider building material selection to limit absorption of solar radiation.
- Automate building systems to reduce solar infiltration (i.e., automatic window blinds) or provide manual alternatives.
- Maximize shade along pedestrian routes and in parking areas.
- Mitigate the urban heat island effect through plantings, selection of building materials and proactive shade management.

6.3.2 Precipitation

Precipitation, whether it is rainfall, snowfall, or other forms of frozen/liquid water, is the key climate and weather-related variable of concern in stormwater management. As a result of climate change, storm events are predicted to become more intense in the GGH, which can result in larger volumes of precipitation at one time.

The stormwater management design for the Project will consider the drainage and stormwater management objectives of the following:

- MECP Stormwater Management Planning and Design Manual (2003)
- Ministry of Transportation (MTO) Drainage Management Manual (1997)
- Central Lake Ontario Conservation Authority (CLOCA) Technical Guidelines for Stormwater Management Submissions (2020)
- American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering (latest version)
- Metrolinx Standards (latest version)
- GO Design Requirements Manual (latest version)
- requirements of authorities having jurisdiction

This will be supplemented by current guidance such as the runoff volume control targets for Ontario recommended to MECP (Aquafor Beech Ltd. and Earthfx Inc. 2016) from local municipalities and Conservation Authorities.

Stormceptors[50] and stormwater management features must be sized appropriately to manage predicted future scenario flows and sediment loading (i.e., winter and spring).

A detailed Stormwater Management (SWM) Plan will be developed to demonstrate that the proposed Project complies with drainage and SWM requirements with respect to stormwater conveyance, quantity, quality, and water balance prior to the construction phase of the Project.

6.3.3 Intensity-Duration-Frequency Curves

A Draft SWM and Drainage Design Report has been prepared for the Project (Stantec 2023) and will be finalized as design progresses. Criteria for the Project were established to support the design, and analysis and evaluation within the Project limits were undertaken to confirm that the drainage and SWM design complies with applicable design standards, including the application of intensity-duration-frequency (IDF) parameters identified in local municipal standards.

IDF curves are graphical representations of the amount of water that falls within a given period of time in catchment areas and are used by decision makers to plan and design infrastructure to withstand severe weather impacts (Office of the Auditor General of Canada 2016). Current stormwater management practices include the use of IDF data and design storm distributions (e.g., Chicago Storm, Hurricane Hazel), as well as 2-year through to 100-year[51] storm events.

Designing the stormwater management systems for the Project based on up-to-date IDF curves will lead to:

- reduced ongoing operation and maintenance requirements; and,
- limit impacts on surrounding ecosystems, since stormwater management systems will be designed to control runoff from rainfall mostly on-site.

[50] A stormceptor is an oil grit separator/hydrodynamic separator, designed to protect waterways from hazardous material spills and stormwater pollution.
[51] Storm even frequency is used to simplify the definition of a rainfall event that statistically has a chance of occurring once within the given time period (e.g., a 100-year storm has a 1 in 100 (1%) probability of occurring in any given year.

6.3.4 Low-Impact Development

The stormwater management designs for the Project will consider implementation of Low Impact Development (LID) measures. LID is a SWM strategy that seeks to mitigate the impacts of increased runoff and stormwater pollution by managing runoff as close to its source as possible (i.e., in the vicinity of the proposed infrastructure). Compared to conventional design, LID measures allow for increased infiltration of stormwater through built infrastructure, which would be beneficial for managing stormwater should storms increase in intensity. LID design strategies include measures that can effectively remove nutrients, pathogens and metals from runoff, and reduce the volume and intensity of stormwater flows (Sustainable Technologies Evaluation Program (STEP) 2020).

The design of the LID measures will consider the guidance provided in the Low Impact Development Stormwater Management Planning and Design Guide (STEP 2020). Over the long-term operation of the Project, stormwater management facilities including LID measures will be monitored to check that these features are maintained appropriately and repaired where and when required.

6.3.4.1 Erosion and Sediment Control Measures

An increase in storm intensity, which is projected as a result of climate change (see Table 6.3), can make erosion and sedimentation more likely, especially during construction. Erosion and Sediment Control (ESC) measures, including the development of an ESC Plan, will be implemented during the construction phase of the Project to control stormwater runoff and prevent sediment from entering sewers and watercourses, to the extent feasible. The ESC Plan will detail necessary siltation control facilities and be designed in accordance with the current municipal and CLOCA guidelines. As per CLOCA guidelines, ESC Plans should be developed in accordance with the Erosion and Sediment Control Guideline for Urban Construction (TRCA 2019). Installation and monitoring of appropriate ESC measures will help mitigate potential effects of climate change on the Project.

6.3.5 Drought

As summarized in Table 6.3, the Great Lakes Basin is projected to see increases in frequency and extent of drought. Facilities design will include consideration of water conservation measures to reduce effects of drought on the Project, such as:

- metering indoor and outdoor water use to better track and manage the impacts of extended droughts on operations and landscape plantings.
- using collected rainwater for plant irrigation.
- using water conserving systems to reduce consumption.
- planting drought resistant vegetation.

7.0 Consultation Process

7.1 Consultation Overview

In accordance with Section 15 of O. Reg. 231/08, this section summarizes the consultation activities carried out with respect to the EPR Addendum. Consultation is required for an EPR Addendum if, after submitting a statement of completion of the TPAP, the proponent wishes to make a change to the transit project that is inconsistent with the EPR, and if they deem that change to be significant. As described in Section 1.3.2, this EPR Addendum is considered a Significant Addendum.

Consultation occurred with Project stakeholders (public [including property and business owners], agencies, municipalities, elected officials, and interest groups) and Indigenous communities during the course of the Addendum. This section includes a list of consultation activities, the feedback and comments received, and how they were considered.

7.1.1 Approach to Consultation

The objectives for the consultation program were openness, transparency, access to information, early and ongoing opportunities for input, responsiveness, accountability, and accessible and accurate documentation. These objectives support the purpose of the TPAP, which is to support the design and delivery of a transit solution in a manner that addresses the objectives of provincial and regional transit policy, while limiting negative environmental effects.

An approach that Metrolinx implemented for this Project was the establishment of technical working groups with interested parties. This forum allowed for direct interaction and real time feedback on the Project.

The following draft reports were provided to Indigenous communities for review and comment:

- Draft EPR Addendum
- Tree Inventory Report
- Arborist Report for 450 Fox Street, Oshawa
- Cultural Heritage Report - Existing Conditions and Preliminary Impact Assessment

- Cultural Heritage Evaluation Reports[52] for:
  - 83 Avenue Street, 349 Ritson Road, 356 Ritson Road, 359 Ritson Road, 374 Farewell Street, 394 Simcoe Street South, 399 Simcoe Street South, 464 Ritson Road, 470 Ritson Road, 1490 Baseline Road, 1598 Baseline Road, 1558/1580 Baseline Road, 1604 Baseline Road, 1766 Baseline Road, 2228 Baseline Road, St. Wolodymyr and St. Olha Ukrainian Cemetery
- Cultural Heritage Evaluation Reports for:
  - Albert Street Bridge and Farewell Street Multi-Use Bridge
- Natural Environment Technical Report
- Stage 1 Archaeological Assessment (AA) Report
- Stage 1 AA for Updated Footprint
- Limited Phase I ESA

The consultation process for the EPR Addendum included the following:

- the draft EPR Addendum was distributed to Indigenous communities and agencies for comment on May 10, 2022
- a Notice of Virtual Public Information Centre was:
  - distributed to Project stakeholders (including government agencies, elected officials, and members of the public) and Indigenous communities on May 17, 2023
  - posted on the Metrolinx Project website on May 23, 2023
  - published to local media on May 25th and June 1, 2023
  - Metrolinx's news blog on May 29, 2023
  - social media (@GOExpansion) on May 29 and June 5, 2023
- the Project website (www.metrolinx.com/bowmanville) and email address (DurhamRegion@Metrolinx.com) from the TPAP phase were maintained for Project information and consultation purposes

[52] Indigenous communities were contacted to advise if there was an interest in reviewing the Cultural Heritage Evaluation Reports; only those that requested a review opportunity were provided the reports.

- a virtual Public Information Centre was held to provide information on the addendum process and preliminary findings for environmental technical reports for the proposed Project and to receive feedback and questions about the Project
- engagement with government agencies, elected officials, members of the public, and Indigenous communities
- a Notice of EPR Addendum was distributed to government agencies, elected officials, members of the public and Indigenous communities, published to local media and posted on the Project website to initiate the final 30-day review of this EPR Addendum. The EPR Addendum was made available electronically for public review on October 5, 2023.

Metrolinx has the ultimate responsibility for the safe and effective implementation of the Project and will manage consultation approaches consistently with applicable regulations and standards, making reasonable effort to resolve issues, and track outstanding issues and commitments through subsequent Project phases.

7.1.2 Record of Consultation

Comments and questions arising from consultation activities were tracked and managed on an ongoing basis and incorporated into the development of the EPR Addendum as appropriate. All documents produced for consultation activities, including a comment tracking table and registry, were maintained as part of a Record of Consultation (RoC) (Appendix B). The RoC includes the following:

- Project Contact List that provides details of contacts included on Project correspondence (contact details redacted as required for privacy) (Appendix B1)
- Project Correspondence Tracking Log that documents consultation activities and includes information on relevant correspondence, notices, presentation materials and communication items for the Project (contact details redacted as required for privacy) (Appendix B2)
- copies of correspondence letters between Metrolinx and interested parties (contact details redacted as required for privacy) (Appendices B3, B4, B5, B6, B7 and B8)
- records of meetings and pop-events held in support of the Project (Appendix B9)
- a summary of the Virtual Public Information Centre and Virtual Open House (Appendix B10)

7.1.3 Identification of Interested Parties

Potentially interested parties were initially identified through review of the MECP Government Review Team (GRT) list, by reaching out to a local and regional municipal bodies and agencies with jurisdiction in the Study Area, obtaining a list of Indigenous communities contacts from the MECP (Section 7.6.3), developing a distribution map for Canada Post mailings within the City of Oshawa and the Municipality of Clarington, obtaining a list of property owners within 800 m of the Project Footprint, and identifying any elected officials who may have an interest in the Project. The contact list for the Project has evolved throughout the environmental assessment (EA) process, based on the level of interest expressed by individuals or additional guidance received by regulatory bodies throughout the study.

Agencies and Public Bodies

Representatives from the following public bodies were included in the stakeholder contact list:

Federal Government

- Canadian Pacific Railway (CP Rail)
- Canadian National Railway (CN Rail)
- Environment and Climate Change Canada (ECCC)
- Fisheries and Oceans Canada (DFO)
- Transport Canada
- VIA Rail Canada (VIA)

Provincial Government

- Conservation Ontario
- Infrastructure Ontario
- Ministry of Citizenship and Multiculturalism (MCM)
- Ministry of Community Safety and Correctional Services
- Ministry of Economic Development, Job Creation and Trade
- Ministry of Education

- Ministry of Environment, Conservation and Parks (MECP)
- Ministry of Tourism, Culture and Sport (MTCS)
- Ministry of Indigenous Affairs
- Ministry of Municipal Affairs and Housing
- Ministry of Natural Resources, and Forestry (MNRF) (formerly Ministry of Northern Development, Mines, Natural Resources and Forestry)
- Ministry of Mines
- Ministry of Transportation (MTO)
- Ontario Heritage Trust (OHT)
- Ontario Power Generation
- Ontario Provincial Police

Municipal Government, Conservation Authorities and Related Municipal Bodies

- Central Lake Ontario Conservation Authority (CLOCA)
- Clarington Library
- City of Oshawa
- Durham Catholic District School Board
- Durham District School Board
- Municipality of Clarington
- Municipal police, fire and emergency services
- Oshawa Public Libraries
- Regional Municipality of Durham
- Town of Whitby

7.1.3.1 Elected Officials

The following elected officials were included in the contact list:

Members of Parliament

- Ajax – Hon. Mark Holland
- Durham – Hon. Erin O'Toole
- Pickering-Uxbridge – Hon. Jennifer O'Connell
- Oshawa – Hon. Colin Carrie
- Whitby – Hon. Ryan Turnbull

Members of Provincial Parliament

- Ajax – Patrice Barnes
- Durham – Todd McCarthy
- Durham – Lindsey Park (former)
- Kawartha Lakes-Brock – Laurie Scott
- Northumberland-Peterborough South – David Piccini
- Oshawa – Jennifer French
- Peterborough-Kawartha – Dave Smith
- Pickering-Uxbridge – Peter Bethlenflavy
- Whitby – Lorne Coe

Regional and Municipal Officials

- City of Oshawa – Dan Carter (Mayor), John Neal (Regional and City Councillor), Rosemary McConkey (City Councillor), Tito-Dante Marimpietri (Regional and City Councillor), Jane Hurst (former City Councillor), Bob Chapman (Regional and City Councillor), Bradley Marks (City Councillor), Rick Kerr (Regional and City Councillor), Derek Giberson (City Councillor), Brian Nicholson (Regional and City Councillor), John Gray (City Councillor), Jim Lee (City Councillor), Mary Mederios (City Clerk)
- City of Pickering – Kevin Ashe (Mayor), Marisa Carpino (Chief Administrative Officer), Linda Cook (Regional Councillor), Lisa Robinson (Regional Councillor), David Pickles (Regional Councillor), Maurice Brenner (City Councillor), Mara Nagy (City Councillor), Shaheen Butt (City Councillor)
- Municipality of Clarington – Adrian Foster (Mayor), Joe Neal (former Regional and Municipal Councillor), Granville Anderson (Regional and Municipal Councillor),

Corinna Traill (Municipal Councillor), Margaret Zwart (Municipal Councillor), Willie Woo (Regional Councillor), Sami Elhaijeh (Municipal Councillor), Lloyd Rang (Municipal Councillor), June Gallagher (City Clerk)

- Regional Municipality of Durham – John Henry (Regional Chair), Elaine Baxter-Trahair (Chief Administrative Officer)
- Town of Ajax – Shaun Collier (Mayor), Jennifer Larmand (City Clerk), Marilyn Crawford (Regional Councillor), Sterling Lee (Regional Councillor), Joanne Dies (Regional Councillor), Rob Tyler Morin (Town Councillor), Ashmeed Khan (Town Councillor), Lisa Bower (Town Councillor)
- Town of Whitby – Elizabeth Roy (Mayor), Kathryn Douglas (City Clerk), Chris Leahy (Regional Councillor), Rhonda Mulcahy (Regional Councillor), Maleeha Shahid (Regional Councillor), Steve Yamada (Regional Councillor), Steve Lee (Town Councillor), Matt Cardwell (Town Councillor), Niki Lundquist (Town Councillor), Victoria Bozinovski (Town Councillor)
- Township of Brock – Walter Schummer (Mayor), Dean Hustwick (Chief Administrative Officer), Peter Frank (Regional Councillor), Michael Jubb (Township Councillor), Claire Doble (Township Councillor), Angela Canavan (Township Councillor), Cria Pettingill (Township Councillor), Lynn Campbell (Township Councillor)
- Township of Scugog – Wilma Wotten (Mayor), Lisa Fitton (City Clerk), Ian McDougall (Regional Councillor), David LeRoy (Township Councillor), Janna Guido (Township Councillor), Robert Rock (Township Councillor), Harold Wright (Township Councillor), Terry Coyne (Township Councillor), Ken Knix (Chief Administrative Officer)
- Township of Uxbridge – Dave Barton (Mayor), Kristi Honey (Chief Administrative Officer), Bruce Garrod (Regional Councillor), Pamela Beach (Township Councillor), Gord Shreeve (Township Councillor), Zed Pickering (Township Councillor), Willie Popp (Township Councillor), Todd Snooks (Township Councillor)

7.1.3.2 Other Stakeholders

Stakeholders who may have an interest in the Project and were not identified through GRT review and consultation with agencies were contacted through email, where email addresses were available and direct mail where address information was available. The stakeholders contacted include:

Interest Groups and Community-Based Organizations

- Electrical Vehicle Society – Northumberland Chapter
- Oshawa Senior Community Centres 55+
- Trent University

Individuals and Landowners

- Property owners within 500 m of the Project Footprint for the Notice of Virtual Public Information Centre
- Property owners within 800 m of the Project Footprint for the Notice of EPR Addendum
- Virtual Public Information Centre and live Virtual Open House attendees

Utilities

- Hydro One Networks Inc.

7.1.4 Influence of Consultation on the EPR Addendum

Consultation activities undertaken throughout the study were documented and incorporated into the EPR Addendum. Key comments received include input on:

- The design approach to Project components, which influenced conceptual design changes and consideration of refinements to the Project, such as adjustments to the Michael Starr Trail Multi-Use Crossing.
- Potential effects to the environmental components, which resulted in:
  - Incorporation of additional details of proposed mitigation to address known potential effects, providing improved clarity and understanding for stakeholders.
  - Review of the effects assessment and associated updates to proposed mitigation measures, as required.
- Project components and mitigation measures subject to the need for ongoing discussions, which resulted in commitments to undertake additional engagement activities with certain stakeholders following the TPAP.

Comments and questions received by the Project team were considered and addressed in the report or through direct follow-up by the Project Team.

An overview of the comments received and resulting changes to the Project is presented in Sections 7.3, 7.4, 7.5, and 7.6.

7.2 Engagement with the Public

7.2.1 Pop-Up Events

Metrolinx held a number of pop-up events to provide the opportunity for the public to ask questions and provide feedback on the Project. The pop-up events were not Bowmanville Extension specific events, and are not considered as a formal consultation opportunity, however the majority of the comments received were on the Project. The information was shared through the Metrolinx Twitter handle @GOExpansion and the Durham Region online news platform. Table 7.1 below provides a summary of the pop-up events.

Table 7.1: Summary of Pop-up Events

Pop-up Date	Event Details	Pop-up Event Summary
August 26, 2022	Touch a Truck – Tribute Communities Centre 99 Athol Street East, Oshawa 4:00 pm to 8:00 pm	400 members of the public attended. Discussion topics included: • Project completion date and updates
October 15, 2022	Bowmanville Applefest Bowmanville 9:00 am to 5:00 pm	220 members of the public attended. Discussion topics included: • Bus routes and connections • Project completion date and updates • GO Expansion details and upgrades
November 15, 2022	Clarington Library – Bowmanville Branch 163 Church Street, Bowmanville 10:00 am to 1:00 pm	20 members of the public attended. Discussion topics included: • Project completion date and updates • Proposed GO station locations
November 29, 2022	Iroquois Sports Park Centre 500 Victoria Street West, Whitby 5:00 pm to 9:00 pm	40 members of the public attended. Discussion topics included: • Project completion date and updates • Proposed GO station locations
December 13, 2022	Clarington Library – Bowmanville Branch 163 Church Street, Bowmanville 10:00 am to 1:00 pm Delpark Homes Centre	45 members of the public attended. Discussion topics included: • Project completion date and updates • Proposed GO station locations • How to utilize PRESTO

Pop-up Date	Event Details	Pop-up Event Summary
	1661 Harmony Road North, Oshawa 2:00 pm to 4:00 pm	
December 20, 2022	Clarington Library – Bowmanville Branch 163 Church Street, Bowmanville 10:00 am to 1:00 pm	25 members of the public attended. Discussion topics included: • Project completion date and updates • Proposed GO station locations
January 18, 2023	Clarington Library – Bowmanville Branch 163 Church Street, Bowmanville 10:00 am to 1:00 pm	40 members of the public attended. Discussion topics included: • Project completion date and updates • Proposed GO station locations • Status of the Project • GO Expansion details and upgrades
January 24, 2023	Clarington Library – Bowmanville Branch 163 Church Street, Bowmanville 10:00 am to 1:00 pm	25 members of the public attended. Discussion topics included: • Bus routes and connections • Project completion date and updates • GO Expansion details and upgrades
February 3, 2023	Clarington Public Library Bowmanville Branch 163 Church Street, Bowmanville 10:00 am to 1:00 pm	15 members of the public attended. Discussion topics included: • Project completion date and updates • Proposed GO station locations • Status of the Project • GO Expansion details and upgrades
February 6, 2023	Oshawa Library – McLaughlin Branch, 65 Bagot Street, Oshawa 11:00 am to 1:00 pm	20 members of the public attended. Discussion topics included: • Project completion date and updates • Proposed GO station locations • Proposed alignment
February 8, 2023	Pickering Public Library Central Branch 1 The Esplanade South, Pickering 10:00 am to 12:00 pm Pickering Public Library George Ashe Branch 470 Kingston Road, Pickering 1:00 pm to 3:00 pm	15 members of the public attended the two pop-up events. Discussion topics included: • GO Expansion details and upgrades • Project completion date and updates

Pop-up Date	Event Details	Pop-up Event Summary
February 15, 2023	Ajax Public Library 55 Harwood Avenue South, Ajax 10:00 am to 1:00 pm	20 members of the public attended. Discussion topics include: • GO Expansion details and upgrades • Project completion date and updates • Bus routes and connections
February 20, 2023	Ajax Winterfest Audley Recreation Centre 1955 Audley Road, Ajax 11:00 am to 4:00 pm	280 members of the public attended the pop-up table. Discussion topics included: • GO Expansion details and upgrades • Project completion date and updates • Bus routes and connections
February 22, 2023	Oshawa Library – McLaughlin Branch 65 Bagot Street, Oshawa 10:45 am to 12:45 pm	25 members of the public attended. Discussion topics included: • Project completion date and updates • Proposed GO station locations • Proposed alignment
February 27, 2023	Whitby Public Library 405 Dundas Street West, Whitby 10:00 am to 12:00 pm	25 members of the public attended. Discussion topics included: • GO Expansion details and upgrades • Bus routes and connections • Construction impacts
March 8, 2023	Garnet B. Rickard Arena 2440 Durham Regional Highway 2, Bowmanville 11:00 am to 1:00 pm	18 members of the public attended. Discussion topics included: • Project completion date and updates
March 14 and 16, 2023	March Break Events Clarington Library Bowmanville Branch 163 Church Street, Bowmanville March 14 and 12, 2023 10:00 am to 12:30 pm Clarington Library Courtice Library Branch 2950 Courtice Road, Courtice March 14, 2023 2:00 pm to 4:00 pm Clarington Library Newcastle Branch, 150 King Avenue East, Newcastle March 16, 2023 1:00 pm to 2:30 pm	75 members of the public attended the four March Break Events. Discussion topics included: • Project completion date and updates • upcoming public engagement opportunities

Pop-up Date	Event Details	Pop-up Event Summary
March 21, 2023	Oshawa Library McLaughlin Branch 65 Bagot Street, Oshawa 10:45 am to 12:45 pm	22 members of the public attended. Discussion topics included: • Project completion date and updates • Bus routes and connections
March 23, 2023	Whitby Library Central Branch 405 Dundas Street West, Whitby 10:00 am to 12:00 pm	18 members of the public attended. Discussion topics included: • Project completion date and updates • Bus routes and connections
March 28, 2023	Pickering Public Library George Ashe Branch 470 Kingston Road, Pickering 11:00 am to 1:00 pm	18 members of the public attended. Discussion topics included: • GO Expansion details and upgrades • Project completion date and updates • Bus routes and connections
April 3, 2023	Ajax Public Library 55 Hardwood Avenue South, Ajax 11:00 am to 1:00 pm	20 members of the public attended. Discussion topics included: • GO Expansion details and upgrades • Project completion date and updates • Bus routes and connections • How to utilize PRESTO
April 13, 2023	Oshawa Library – McLaughlin Branch 65 Bagot Street, Oshawa 11:00 am to 1:00 pm	30 members of the public attended. Discussion topics included: • Project completion date and updates • Bus routes and connections • Construction impacts
April 19, 2023	Chestnut Hill Developments Community Centre 1867 Valley Farm Road, Pickering 4:30 pm to 7:00 pm	30 members of the public attended. Discussion topics included: • GO Expansion details and upgrades • Recent construction notices • Project completion date and updates
April 25, 2023	Clarington Library – Bowmanville Branch 163 Church Street, Bowmanville 11:00 am to 1:00 pm	22 members of the public attended. Discussion topics included: • Project completion date and updates • Bus routes and connections
May 6, 2023	Bowmanville Maplefest 8:30 am to 5:00 pm	345 members of the public attended the pop-up table. Discussion topics included: • Project completion date and updates • GO Expansion details and upgrades • How to utilize PRESTO and Triplinx • Bus routes and connections

Pop-up Date	Event Details	Pop-up Event Summary
July 21, 2023	Bowmanville Farmers' Market 2440 Highway 2, Bowmanville 7:45 am to 3:00 pm	61 members of the public attended the pop-up table. Discussion topics included: • Project completion date and updates • GO Expansion details and upgrades • How to utilize PRESTO and Triplinx • Bus routes and connections
July 24, 2023	Oshawa Library – McLaughlin Branch 65 Bagot Street, Oshawa 10:00 am to 2:00 pm	30 members of the public attended the pop-up table. Discussion topics included: • Project completion date and updates • GO Expansion details and upgrades
August 8, 2023	Oshawa Library – Delpark Branch, 1661 Harmony Road North, Oshawa 10:00 am to 2:00 pm	47 members of the public attended the pop-up table. Discussion topics included: • Project completion date and updates • Proposed GO station locations
August 16, 2023	Whitby Library Central Branch / Whitby Farmers' Market 405 Dundas Street West, Whitby 9:30 am to 3:00 pm	96 members of the public attended the pop-up table.
August 18, 2023	Bowmanville Farmers' Market 2440 Highway 2, Bowmanville 8:30 am to 2:00 pm	12 members of the public attended the pop-up table.
August 22, 2023	Pickering Recreation Complex – Pickering Farmers' Market 1867 Valley Farm Road, Pickering 9:00 am to 2:30 pm	90 members of the public attended the pop-up table.
August 31, 2023	Durham College Whitby Welcome – Whitby Campus 1690 Champlain Avenue, Whitby 11:00 am to 2:00 pm	200 members of the public attended the pop-up table. Discussion topics included: • The U-Pass • Student discounts on PRESTO
September 5, 2023	Durham College Fest – Durham College Oshawa Campus – South Village Courtyard 2000 Simcoe Street. North, Oshawa 12:00 pm to 4:00 pm	650 members of the public attended the pop-up table. Discussion topics included: • The U-Pass • Student discounts on PRESTO
September 19, 2023	Pickering Recreation Complex – Pickering Farmers' Market 1867 Valley Farm Road, Pickering 9:00 am to 2:30pm	47 members of the public attended the pop-up table. Discussion topics included: • The Project • GO Expansion • Durham Region Bus Rapid Transit

7.2.2 Notice of Virtual Public Information Centre

A Notice of Virtual Public Information Centre was sent to parties on the contact list in multiple formats (i.e., email notices, bulk mailout, newspaper notices, Twitter, GO train announcements on the Lakeshore East Line) to invite stakeholders with a potential interest in the Project and other interested persons to attend the Virtual Public Information Centre hosted on the event webpage and the Live Virtual Open House held through Microsoft Teams Webinar which attendees registered for. The virtual Public Information Centre provided the opportunity to learn about the Project and provide their questions and/or comments to members of the Project Team.

The Notice was also delivered via Canada Post mail to property owners by using a 500 m postal code walk, which included postal codes of residents and businesses within approximately 500 m of the Project Footprint and posted to the Project website.

Prior to the Virtual Public Information Centre, to help promote the Virtual Open House and the Virtual Public Information Centre, flyers were posted on community boards in each of the following locations:

- Clarington Library – for both Courtice and Bowmanville Branch
  - 200 postcards dropped off and flyers for the community bulletin board
- Oshawa Library – McLaughlin Branch
  - 100 postcards dropped off and flyers for the community bulletin board
- Oshawa Senior Community Centres 55+ (All Branches)
  - 200 postcards dropped off and flyers for the community bulletin board

A news release was sent out on June 15, 2023 by the Ontario government online describing the Project's progress and how the Project will affect local communities. The news release also indicated that a Virtual Public Information Centre was ongoing for the Project's EPR Addendum and the materials were available online for review and comment (https://www.metrolinx.com/en/projects-and-programs/lakeshore-east-line-go-expansion/get-involved/bowmanville-extension-pic-june-8-to-21) until June 21, 2023.

A copy of the Notice is in Appendix B11.

7.2.2.1 Metrolinx Website

Notice was posted on the Metrolinx website on May 29, 2023 (https://www.metrolinx.com/en/news/virtual-open-house-to-be-held-in-June-for-Bowmanville-Extension). The Notice identified changes to the Project since the completion of the 2011 EPR, such as changes to track alignment, bridges including new crossings, replacements and expansions, new potential stations and layover facility. Further background information was described and instructions on how to participate.

7.2.2.2 Social Media

The Notice was posted on the GO Expansion Twitter page on May 29, 2023 (https://twitter.com/GOExpansion/status/1663283271386398720?s=20) and June 5, 2023 (https://twitter.com/GOExpansion/status/1665743272914944001?s=20i). As of July 19, 2023 the tweet posted on May 29 received 3,782 views,12 retweets and 26 likes while the tweet on June 5 received 4,148 views with 11 retweets and 24 likes. These postings can be found in Appendix B.

7.2.2.3 GO Train Announcements

During the week of May 22nd and May 29th, the Lakeshore East GO Trains played onboard announcements for riders entering and exiting the trains at the DC Oshawa GO Station.

The onboard announcements played during the two-week period were played in both English and French and said:

> "We're one step closer to bringing you two-way, all-day rail service from Oshawa to Bowmanville, and we want your feedback. An addendum to our Environmental Project Report is ready and available to review and comment on until June 21st. You can also join our virtual open house on June 14th from 6:30 PM to 8:00 PM. Learn more and register at metrolinx.com/bowmanville."

7.2.2.4 Canvassing to Support the Virtual Public Information Centre and Virtual Open House

The Metrolinx Community Engagement Team carried out neighbourhood canvassing, targeting specific neighbourhoods in the Project area which are located beyond the 500 m mail-out area (refer to Section 7.1.3.2) but where residents are likely to have an interest in the Project. From May 30 to June 20, 2023, Metrolinx distributed approximately 1,500 postcards containing information about the Project and the Virtual Public Information Centre and Virtual Open House. Since canvassing was carried out both before and after the Virtual Open House, Metrolinx distributed two versions of the flyers; one version of the flyer was used prior to the Virtual Open House, and the other was distributed following the Virtual Open House, but still within the period of the Virtual Public Information Centre.

Overall, Metrolinx canvassed 3,100 households and spoke to approximately 45% of homeowners. About 166 interaction reports, where Project specific comments were provided by a resident, were created based on the conversations with homeowners and the Metrolinx team. Areas canvassed, the date and time and approximate number of door knocks are detailed in Table 7.2 below. Copies of the flyers and postcards can be found in Appendix B.

Table 7.2: Summary of Canvassing Details

Area	Date / Time	Door Knocks (Number Approximate)
Bowmanville	May 30, 2023 10:00 am to 2:00 pm	400
Oshawa	May 31, 2023 10:30 am to 2:30 pm	400
Oshawa	June 5, 2023 11:00 am to 3:00 pm	400
Oshawa / Whitby	June 9, 2023 11:00 am to 3:00 pm	500
Bowmanville	June 13, 2023 11:00 am to 5:00 pm	600
Bowmanville	June 15, 2023 11:00 am to 2:00 pm	300
Bowmanville	June 19, 2023 11:00 am to 2:00 pm	300
Bowmanville	June 20, 2023 11:00 to 2:00 pm	200

7.2.2.5 Notice to Regional and Municipal Staff and Elected Officials

On May 24, 2023, Metrolinx also contacted Durham Region, the City of Oshawa, Municipality of Clarington and Town of Whitby elected officials, staff and MPP Lorne Coe and MPP Todd McCarthy regarding the upcoming Virtual Public Information Centre and Virtual Open House. The Metrolinx team also contacted Municipal Communications staff and library contacts. The email included website links to review the Public Information Centre materials, a link to post questions to be answered during the Virtual Open House via Slido, where to register for the Virtual Open House and dates of the online events. A postcard containing information about the Project and the Virtual Public Information Centre and Virtual Open House was attached to this email.

7.2.2.6 Libraries and Posting to Community Boards

Prior to the Virtual Open House, Metrolinx also deposited postcards at local libraries and community centers and posted flyers on community boards on May 24, 2023. Materials were provided to the following locations:

- Courtice and Bowmanville Branches, Clarington Public Library
  - 200 postcards

  - Flyers posted to community board
- McLaughlin Branch, Oshawa Public Library
  - 100 postcards
  - Flyers posted to community board
- John Street, Northview, Conant, Delpark Homes, Sikorski Branches, Oshawa Senior Community Centres
  - 200 postcards
  - Flyers posted to community board

7.2.2.7 On the GO Alerts

The On the GO (OTG) Alerts were sent to subscribers of the OTG Alerts tool for DC Oshawa GO Station and who were subscribed to marketing notifications.
The OTG Alerts went out on: May 25, June 2, 9, 13, and 14, 2023. The text used for the OTG Alerts was:

SUBJECT LINE:
We're one step closer to starting construction and bringing two-way, all-day rail service from Oshawa to Bowmanville.
HEADER:
We've been making progress on the design for the Bowmanville Rail Service Extension project, which means we needed to update our environmental studies.

BODY:
The addendum to our Environmental Project Report is almost ready, and we can’t wait to share it with you. Why? Because it means that we’re one step closer to starting construction and bringing two-way, all-day rail service from Oshawa to Bowmanville. We know you have questions about how we’ll protect the environment during this project and we’re ready to answer them.
Materials will be available online for review and comment from June 8th to June 21st, 2023. Register for the open house taking place on June 14th from 6:30-8:00 pm on the Bowmanville Extension webpage.

More GO Transit service in the Durham Region means more people connecting with what’s important to them. It’s more places to call home, more ways to get to school or your dream job, more access to healthcare and so much more.

Register for our open house here: www.metrolinx.com/bowmanville.

7.2.3 Virtual Public Information Centre

The Virtual Public Information Centre was hosted by Metrolinx via their website (https://www.metrolinx.com/en/projects-and-programs/lakeshore-east-line-go-expansion/get-involved/bowmanville-extension-pic-june-8-to-21) from June 8 to 21, 2023. The material posted can be found in Appendix B.

The information posted in the Public Information Centre included background information related to the 2011 EPR; the existing conditions at the Project locations; the EPR Addendum process; potential effects, and next steps on the Project. Additionally, the results of the technical studies, ongoing Indigenous communities engagement and Project maps were also provided. Potential impact and proposed mitigation measures for the following disciplines were also posted:

- Natural Environment
- Tree Inventory
- Geology & Groundwater
- Stormwater Management
- Air Quality
- Noise & Vibration
- Socio-Economic and Land Use
- Traffic & Transportation
- Cultural Heritage
- Archaeology

The purpose of the Virtual Public Information Centre was to gather feedback on the Project to better understand the main concerns from the public. The comments and questions raised on Slido, a virtual Q&A and polling platform, were answered by the Team Panel during the live Virtual Open House. Those that were missed were responded to via email. Comments or questions received through direct email were addressed by the Project Team through an email response. Copies of these can be found in Appendix B.

Table 7.3: Summary of Virtual Public Information Centre Details

Category	Details
Date	June 8 to 21, 2023
Project Information Presented and Made Available	• Background information related to the 2011 EPR • The existing conditions at the Project locations • The TPAP Addendum Process • Potential effects, impacts, and proposed mitigation measures from the various disciplines (Natural Environment, Tree Inventory, Geology & Groundwater, Stormwater Management, Air Quality, Noise & Vibration, Socio-Economic and Land Use, Traffic & Transportation, Cultural Heritage, and Archaeology) • Results of the technical studies and ongoing Indigenous Communities engagement and Project maps • Next Steps for the Project

A live Virtual Open House was held on June 14, 2023 with advertised start and end times from 6:30-8:00 pm during which the Project team was available to answer questions about the Project. A summary of topics discussed during the live Virtual Open House are below in Table 7.4. Attendees were encouraged to submit questions prior to and during the live Virtual Open House on the Project website (www.metrolinx.com/bowmanville). The link for the Project's Virtual Open House was uploaded to YouTube on June 16, 2023 (https://www.youtube.com/watch?v=h3gpGWGm9M0).

Table 7.4: Summary of Key Live Virtual Open House Details

Category	Details
Date and Time	June 14, 2023 from 6:30 to 8:00 pm
Registration page views	2,350
Registered participants	410
Canceled registrations	1
Attended participants	226

Category	Details
Topics Discussed	• Opportunities and concerns identified on previously submitted comments • A description of the Project and key Project components, including Transit Oriented Communities • Benefits of the Project • The TPAP and EPR Addendum process, including anticipated timelines • Rationale for the Addendum • A list of environmental studies undertaken to support the Project • A description of the potential effects as a result of the Project by technical disciplines and proposed mitigation measures • A request for comments to be submitted by June 21, 2023

7.2.4 Canvassing

In addition to the canvassing to support the Virtual Public Information Centre and Virtual Open House (refer to Section 7.2.2.4), the Metrolinx Community Engagement Team carried out additional neighbourhood canvassing in areas where residents are likely to have an interest in the Project.

Overall, Metrolinx canvassed over 2,800 households and spoke to approximately 45% of homeowners. About 400 interaction reports, where Project specific comments were provided by a resident, were created based on the conversations with homeowners and the Metrolinx team. Areas canvassed, the date and time and approximate number of door knocks are detailed in Table 7.5 below.

Table 7.5: Summary of Canvassing Details

Area	Date / Time	Door Knocks (Number Approximate)
Oshawa	August 14, 2023 10:00 am to 2:00 pm	450
Oshawa	August 21, 2023 10:00 am to 2:00 pm	350
Pickering	August 24, 2023 10:00 am to 2:00 pm	250
Whitby	August 28, 2023	280

Area	Date / Time	Door Knocks (Number Approximate)
	10:00 am to 2:00 pm	
Pickering	August 31, 2023 10:00 am to 2:00 pm	350
Whitby	September 11, 2023 10:00 am to 2:00 pm	200
Ajax	September 14, 2023 10:00 am to 2:00 pm	240
Ajax	September 18, 2023 10:00 am to 2:00 pm	265
Clarington	September 21, 2023 10:00 am to 2:00 pm	200
Clarington	September 25, 2023 10:00 am to 2:00 pm	235

7.2.5 Key Comments Received from the Public

Project documents and details were made available on the Project website (www.metrolinx.com/bowmanville) for public review and comment. Documents available include Project Information Centre materials. The public and interested parties were able to submit comments through the Durham Community Engagement regional email address (DurhamRegion@metrolinx.com), via Slido on the website, and via telephone throughout the TPAP. Project specific comments are summarized in the table below (Table 7.6).

Table 7.6: Summary of Comments Received from the Public and Responses

Topic	Comment/Concern	Response/Influence on the Project and/or EPR Addendum
Potential Impacts	Members of the public were concerned about the increase of noise as a result of the increased rail traffic.	Potential noise effects are included in the EPR Addendum and mitigation measures such as sound barriers are recommended in the EPR Addendum. Noise barriers are subject to change and will be confirmed as detailed design progresses.

Need for an Addendum	Members of the public asked for clarity as to a technical reason to warrant an EPR Addendum.	Based on the advancements of the design since the 2011 EPR, it was determined that an EPR Addendum was required to assess the environmental impacts that were not previously assessed.
Conceptual Design Drawings	Member of the public requested copies of the conceptual design drawings.	Metrolinx confirmed that conceptual design drawings will be included in the EPR Addendum for review.
Construction Timeline	Members of the public were concerned regarding the length of Project construction.	Metrolinx will develop a timeline for construction following the completion of the EPR Addendum and with input from the Project Manager.
Transit Oriented Community	Members of the public were concerned with the construction and coordination regarding Transit Oriented Communities.	Metrolinx will continue to advance discussions with third parties to explore opportunities to deliver the GO stations proposed through the Transit Oriented Community.

7.2.6 Direct Engagement with the Property Owners

Throughout the Project, letters were provided to property owners where the potential property impacts were anticipated.

Project specific comments are included in Table 7.6 above.

7.3 Engagement with Agencies

Initial consultation with agencies included introducing the Project through an introduction letter and a request for information regarding any required regulatory processes that the Project would be required to follow. Metrolinx also sent the MECP a letter (April 7, 2021) requesting direction on Indigenous consultation for the Project. Metrolinx offered Agency representatives a chance to meet to discuss the Project, with a focus on identification of concerns or requirements that needed to be met.

Agency consultation included information requests, telephone conversations, email correspondence, and meetings with agency representatives. The MTCS, CLOCA and the Ontario Heritage Trust (OHT) were also contacted to collect information that was used to develop the baseline studies and technical assessment reports. Metrolinx will continue to consult with representatives from these agencies and others as the Project progresses.

As part of engagement for the Project, Metrolinx shared the following Project notices and reports with agencies:

- Metrolinx sent an Upcoming Notice of TPAP Addendum to agencies on March 25, 2022 (with a follow-up email to several recipients with incorrect emails addresses on March 28, 2022) which outlined the Project background, status of the Project, and preliminary Project schedule.
- On May 10, 2022, Metrolinx provided a link to all agencies listed in Section 7.1.3.1 to access and review the draft EPR Addendum and technical reports.
- On September 19, 2022, Metrolinx provided comment response sheets back to agencies (MNRF, CP Rail, MTO, CLOCA) who had responded by the appropriate deadline for the draft EPR Addendum.
- On April 20, 2023, Metrolinx provided an update noting that additional footprint requirements were identified at various locations and requested confirmation on if the agencies would be interested in reviewing the updated technical reports.
- On May 5, 2023, Metrolinx provided a comment response sheet to MCM for comments received on the draft EPR Addendum. The comment response sheet was resent to MCM on June 28, 2023.
- On May 29, 2023, Metrolinx provided a comment response sheet to CLOCA for comments received on the draft EPR Addendum.
- On June 30, 2023, Metrolinx provided comment response sheets back to agencies (CP Rail, MECP, MTO) who had provided response on the draft ERP Addendum.
- On August 11, 2023, Metrolinx provided draft conceptual drawings to CP Rail, MCM, MECP, CLOCA, MTO for review.
- On August 18, 2023, Metrolinx provided responses to comments received from CP Rail on the draft 95% EPR Addendum.
- On September 5, 2023, Metrolinx provided the draft 95% EPR Addendum and technical reports to the Ministry of Economic Development for review.
- On September 29, 2023, Metrolinx provided comment response sheets back to agencies (i.e., MCM, MECP, MTO) who had responded by the appropriate deadline for the draft 95% EPR Addendum.
- On September 29, 2023, Metrolinx provided comment response sheets back to agencies (i.e., CP Rail, MTO) who had responded by the appropriate deadline for the draft conceptual level design drawings.

The engagement with the agencies focused on Project design elements and implementation and has included discussions on design standards, impacts to infrastructure, heritage properties and the environment, and alignment with relevant policies and plans. A summary of all engagement activities and records of correspondence are included in the RoC, in Appendix B.

Additionally, Metrolinx met regularly with technical working groups to discuss the preliminary design of the Project and updates to the EPR Addendum. The working group meetings provided an opportunity for the agencies to provide input on the Project. Table 7.7 provides a high-level summary of meetings held with agencies and technical working groups. This table outlines the context of the meetings.

Table 7.7: Summary of Meetings with Agencies

Date	Agency	Meeting Summary
December 18, 2021	MTO	This technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
May 3, 2022	MCM	This meeting was held to provide an overview of the Project and discuss the studies that had been completed to date and shared with Indigenous communities.
October 20, 2022	MECP	This meeting was held to address comments the MECP had regarding the Noise/Vibration Technical Report.
December, 2022	MTO	This meeting was held to provide an overview of the Project.
February 15, 2023	MTO Regional Municipality of Durham City of Oshawa	This technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
May 24, 2023	CLOCA	This workshop was held to review the 50% Detailed Design comments.
May 31, 2023	CLOCA	This meeting was held to discuss the draft EPR Addendum and technical reports.

Agencies were provided the Notice of Virtual Public Information Centre and were invited to submit comments and questions during the TPAP comment period. Key review agencies which were included on the Project distribution list and had identified an interest in the Project and were provided an opportunity to review and comment on the draft EPR Addendum and supporting documents. A summary of key comments and Metrolinx responses are presented in Table 7.8.

Table 7.8: Key Comments from Agencies

Stakeholder/ Commenter	Topic	Comment/Concern	Response/Influence on the Project and/or EPR Addendum
CLOCA	Natural Environment Aspects	Related to language and clarification for the aquatic environment, GO station locations, in-water works timing windows, the NETR, and the existing conditions summary.	Language within the EPR Addendum and NETR was updated to reflect the data received from CLOCA. Further consultation has been undertaken with MNRF and CLOCA to confirm restricted in-water works timing windows.
CN	Pedestrian bridge at the DC Oshawa GO	Additional information was requested regarding the pedestrian bridge at the DC Oshawa GO.	Metrolinx provided the requested information to CN. No updates to the EPR Addendum were required.
CP Rail	EPR Addendum and Technical Studies	The Growth Plan being recently amended, the use of arriving and departing bells and their assessment, tree pruning and removal permit clarification, Migratory Birds Regulation updates, erosion and sediment control clarification.	The EPR Addendum and technical studies were revised as appropriate.
CP Rail	Conceptual Design Drawings	Suggested a note that specifies the designs are preliminary and conceptual, removing dimensions, profile view and labels.	Metrolinx will revise the conceptual design drawings as required.
Hydro One Networks Inc.	Utilities	Confirmed there are existing assets in the subject area but there are no impacts anticipated to their infrastructure.	Metrolinx thanked Hydro One Networks Inc for their confirmation.

Stakeholder/ Commenter	Topic	Comment/Concern	Response/Influence on the Project and/or EPR Addendum
MCM	Archaeology and Cultural Heritage	Provided guidance on the application of the standards and guidelines for conservation of provincial heritage properties, the provincial significance of 500 Howard Street, and the status of the Stage 1 AA. Comments were also provided for properties within the vibration zone of influence and their potential impacts.	The EPR Addendum and CHR were revised to include updated language to address additional clarification and mitigation measures as requested by MCM.
MECP	Air Quality	Provided recommendations and guidelines to maintain consistent air quality requirements with other transit undertakings.	Metrolinx provided additional clarification regarding the methodology established in the air quality workplan, with minor adjustments made to the methodology to align with MECP's recommendations.
MECP	Draft EPR Addendum, Air Quality, Noise and Vibration, Groundwater, Surface Water, and Source Protection	MECP provided comments including, requesting further clarification of Project changes from 2011 to the current conceptual design, including more detail on Indigenous communities in the consultation program overview section, noise wall mitigation measures, updates in text and figures/tables. They requested additional clarification on why certain steps and numbers regarding thresholds for air quality were used.	The EPR Addendum and technical reports were revised based on the comments provided, as appropriate. Meetings were scheduled on September 29, 2022 and October 4, 2022 to discuss the EPR Addendum and technical reports to gain alignment on the approach to report revisions.
MNRF	Permits and Approvals under the Jurisdiction of MNRF, Timing Windows for In-Water Works,	The requirement for a License to Collect Fish for Scientific Purposes and a Wildlife Scientific Collector's Authorization for fisheries work, and the in-water work timing windows	Updates to Section 8.3 of the EPR Addendum to include the permits/approvals identified by MNRF. Further consultation has been undertaken with MNRF and CLOCA to confirm restricted in-water works timing windows.

Stakeholder/ Commenter	Topic	Comment/Concern	Response/Influence on the Project and/or EPR Addendum
MTO	MTO Interests and Jurisdiction	MTO provided comments including Ministry of Labour Requirements, traffic around the closure of Simcoe Street and Ritson Road, consultation, the preliminary design for their new Right-of-Way and Highway 418 and proposed upgrades for their at-grade crossing.	The EPR and technical reports were refined for the construction staging scenario through discussions with stakeholders proceed.
MTO	Conceptual Design Drawings	Commented on the Highway 401 bridge design and traffic control and management during the construction phase.	Metrolinx will revise the conceptual design drawings as required.

7.4 Engagement with Municipalities

Metrolinx engaged with the City of Oshawa, Municipality of Clarington, Town of Whitby, and Regional Municipality of Durham at both the staff and leadership levels to help inform the conceptual design assessed in this EPR Addendum and confirm commitments for incorporating additional design detail as planning progresses beyond the TPAP phase. Metrolinx acknowledges the integral relationship required with the City of Oshawa, Municipality of Clarington, Town of Whitby, and Regional Municipality of Durham to support the development of the conceptual design and in the identification of applicable policies, standards and the future municipal initiatives relevant to key structural Project components.

The engagement with the City, Municipality, Town, and Region focused on Project design elements and implementation and has included discussions on design standards, impacts to infrastructure and alignment with relevant policies and plans. As part of engagement for the Project, Metrolinx shared the following Project notices and reports with agencies:

- Metrolinx sent an Upcoming Notice of TPAP Addendum to the Regional Municipality of Durham, City of Oshawa, Municipality of Clarington and Town of Whitby on March 25, 2022 which outlined the Project background, status of the Project, and preliminary Project schedule.
- On May 10, 2022, Metrolinx provided a link to the Regional Municipality of Durham, Municipality of Clarington and Town of Whitby access and review the draft EPR Addendum and technical reports.

- On September 19, 2022, Metrolinx provided comment response sheets back to the Regional Municipality of Durham who had provided comments on the draft EPR Addendum.
- On April 20, 2023, Metrolinx provided an update to the Regional Municipality of Durham, City of Oshawa, Municipality of Clarington and Town of Whitby noting that additional footprint requirements were identified at various locations and requested confirmation on if the agencies would be interested in reviewing the updated technical reports.
- On May 24, 2023, Metrolinx provided notification of the Virtual Public Information Centre and Virtual Open House to the Regional Municipality of Durham, City of Oshawa, Municipality of Clarington and Town of Whitby.
- On June 30, 2023, Metrolinx provided a link to the Regional Municipality of Durham and City of Oshawa access and review the revised draft EPR Addendum and technical reports.
- On August 11, 2023, Metrolinx provided draft conceptual design drawings to the Regional Municipality of Durham, City of Oshawa, and Municipality of Clarington for review.
- On September 29, 2023, Metrolinx provided comment response sheets back to the Regional Municipality of Durham who had responded by the appropriate deadline for the draft 95% EPR Addendum.
- On September 29, 2023, Metrolinx provided comment response sheets back to municipalities (i.e., Regional Municipality of Durham, City of Oshawa) who had responded by the appropriate deadline for the draft conceptual level design drawings.

A summary of all engagement activities and records of correspondence are included in the RoC, in Appendix B.

The Project Description outlined in Section 2.0 represents a conceptual design that considers input from the municipalities. This EPR Addendum specifically summarizes municipal input related to the assessment of the Project as described in this report and acknowledges that future design input will be provided by the municipalities, and will be addressed through subsequent design phases.

Metrolinx had met regularly with technical working groups to discuss the preliminary design of the Project and updates to the EPR Addendum. The working group meetings provided an opportunity for the municipalities to provide input on the Project. Table 7.9 provides a summary of meetings with municipalities.

Table 7.9: Summary of Meetings with Municipalities

Date	Municipality	Meeting Summary
October 19, 2017	Regional Municipality of Durham City of Oshawa Municipality of Clarington Town of Whitby	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
December 4, 2018	Regional Municipality of Durham	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
March 13, 2020	Regional Municipality of Durham	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
April 14, 2020	Regional Municipality of Durham	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
May 15, 2020	Regional Municipality of Durham City of Oshawa Municipality of Clarington Town of Whitby	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
July 7, 2020	Regional Municipality of Durham City of Oshawa Municipality of Clarington Town of Whitby	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
August 31, 2020	Regional Municipality of Durham City of Oshawa Municipality of Clarington Town of Whitby	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
October 30, 2020	Regional Municipality of Durham City of Oshawa Municipality of Clarington Town of Whitby	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
March 4, 2021	Regional Municipality of Durham City of Oshawa Municipality of Clarington Town of Whitby	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
April 29, 2021	Regional Municipality of Durham City of Oshawa	Technical working group meeting to discuss preliminary design of the

Date	Municipality	Meeting Summary
	Municipality of Clarington Town of Whitby	Project and updates to the EPR Addendum.
June 29, 2021	Regional Municipality of Durham City of Oshawa Municipality of Clarington Town of Whitby	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
August 25, 2021	Regional Municipality of Durham	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
September 23, 2021	Regional Municipality of Durham City of Oshawa Municipality of Clarington Town of Whitby	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
February 24, 2022	Regional Municipality of Durham City of Oshawa Municipality of Clarington Town of Whitby	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
June 29, 2022	Regional Municipality of Durham City of Oshawa Municipality of Clarington Town of Whitby	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
December 14, 2022	Durham Region Committee of the Whole	This meeting was held to discuss updates, construction timelines and upcoming milestones. Specific questions were posed regarding parking availability, electrification of the CP corridor, and station design.
February 15, 2023	Regional Municipality of Durham City of Oshawa MTO	Transportation Coordination Meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
February 20, 2023	Regional Municipality of Durham	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
February 28, 2023	Regional Municipality of Durham	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.

Date	Municipality	Meeting Summary
March 24, 2023	City of Oshawa	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
March 28, 2023	Regional Municipality of Durham City of Oshawa	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
April 5, 2023	Regional Municipality of Durham	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
April 26, 2023	Regional Municipality of Durham	Technical working group meeting to discuss preliminary design of the Project and updates to the EPR Addendum.
May 19, 2023	Municipality of Clarington	This workshop was held to review the 50% Detailed Design comments.
June 25, 2023	Regional Municipality of Durham	The Regional Municipality of Durham held a meeting to discuss their upcoming project on Bloor Street West surrounding the Durham College Oshawa GO Station.
July 5, 2023	Regional Municipality of Durham	The Regional Municipality of Durham held a meeting to discuss their upcoming Bloor Street Grade Separation Project
July 11, 2023	Regional Municipality of Durham City of Oshawa Municipality of Clarington MTO	This meeting was held to provide an introduction to the Construction Manager at Risk Contracting Model and Construction Management Team.
July 6, 2023	Regional Municipality of Durham City of Oshawa	This technical working group meeting was held to discuss detailed design development.
July 26, 2023	Regional Municipality of Durham City of Oshawa MTO	This technical working group meeting was held to discuss detailed design development.
August 30, 2023	City of Oshawa	This meeting was held to discuss the detailed design development of the Project.
September 13, 2023	Regional Municipality of Durham	This meeting was held to discuss the detailed design development of the Project.

The municipalities were provided the Notice of Virtual Public Information Centre and were invited to submit comments and questions throughout the TPAP. A high-level summary of key comments and Metrolinx responses are below in Table 7.10.

Table 7.10: Key Comments from Municipalities

Stakeholder/ Commenter	Topic	Comment/Concern	Response/Influence on the Project and/or Draft EPR Addendum
Regional Municipality of Durham	Draft EPR Addendum	The Regional Municipality of Durham provided comments on soft mobility connections, additional studies and design changes at bridges, the Fox Street (B1 Thornton's Corners East) station, traffic impacts, permits, pedestrian and cycling connections.	Metrolinx committed to continue to consult with the Regional Municipality of Durham regarding construction of the GO stations. The draft EPR Addendum was revised accordingly to address comments on the Traffic Impact Analysis, bridge design permits and regarding the proposed Stellar Drive Extension.
Regional Municipality of Durham	Draft Traffic Impact Analysis	The Regional Municipality of Durham provided comments on mapping, posted speed limits, traffic counts, the existing GO rail service, the 2021 Regional Cycling Plan, Durham Region Transit operations, lane configurations and road closures.	The Traffic Impact Analysis and EPR Addendum report were revised to include text regarding the posted speed limits, traffic counts, the existing GO rail service and 2021 Regional Cycling Plan, DRT operations and traffic impacts. Mapping was also updated as required.
Regional Municipality of Durham	Conceptual Design Drawings	The Regional Municipality of Durham provided comments on the draft conceptual design drawings and requested increased platforms, label edits and for bridges to accommodate the panned four-lane cross-section for Wilson Road.	Metrolinx will review the comments and update the drawings as necessary.
City of Oshawa	Draft EPR Addendum	The City of Oshawa provided comments on the Ritson station, Laval Drive/Stellar Drive connection, dedicated parking spaces, impacts on adjacent property, station access management, impacts on road closures, development in the study	The draft EPR Addendum was updated to include text that modifications to the design may be required during future design phases to accommodate the proposed extension at Laval Drive and Stellar Drive, impacts on adjacent property and road closures. Commitments

Stakeholder/ Commenter	Topic	Comment/Concern	Response/Influence on the Project and/or Draft EPR Addendum
		area, parkland, Michael Starr Trail, Farewell Street Pedestrian Bridge, 500 Howard Street and identified cultural heritage resources.	regarding undertaking a Heritage Impact Assessment for 500 Howard Street were also included in the EPR Addendum.
City of Oshawa	Conceptual Design Drawings	The City of Oshawa provided comments on the draft conceptual design drawings related to the design of Michael Starr Trail Multi-Use Crossing and accessibility.	Metrolinx will review the comments and update the drawings as necessary.

7.5 Engagement with Elected Officials

Elected officials at the federal and provincial level in whose jurisdiction the Project falls within were included in the Project contact list. Municipal and Regional Councillors for the Wards in which the Project falls and the Wards adjacent to it were also included in the contact list. The full distribution list is available in Appendix B.

Metrolinx met with elected officials to discuss the TPAP and EPR Addendum. Table 7.11 provides a high-level summary of meetings held with elected officials during the TPAP phase of the Project. This table summarizes the context of the meetings.

Table 7.11: Summary of Meetings with Elected Officials

Date	Elected Officials	Attendees	Meeting Summary
December 8, 2022	MPPs	Lorne Coe (MPP- Whitby) Todd McCarthy (MPP-Durham)	This meeting was held to provide background information about the Project and an opportunity to ask questions.
December 14, 2022	Regional Municipality of Durham	John Henry (Chair - Durham Regional) Durham Region Committee of the Whole Durham Region CAO Durham Regional Staff	This meeting was held to provide background information about the Project and an opportunity to ask questions.
May 23, 2023	MPPs	Todd McCarthy (MPP-Durham)	This meeting was held to discuss the TPAP and EPR Addendum.
May 24, 2023	MPPs	Lorne Coe (MPP-Whitby)	This meeting was held to discuss the TPAP and EPR Addendum.

Date	Elected Officials	Attendees	Meeting Summary
May 30, 2023	Regional Municipality of Durham City of Oshawa Municipality of Clarington	John Henry (Chair -Durham Regional) Dan Carter (Mayor - City of Oshawa) Adrian Foster (Mayor - Municipality of Clarington)	This meeting was held to discuss the TPAP and EPR Addendum.
June 2, 2023	MPPs	Jennifer French (MPP-Oshawa)	This meeting was held to discuss the TPAP and EPR Addendum.
June 2, 2023	City of Oshawa	John Gray (City Councillor)	This meeting was held to discuss the TPAP and EPR Addendum.

7.6 Engagement with Indigenous Communities

Metrolinx is committed to building meaningful and long-term relationships with Indigenous communities. Through its Indigenous Relations Office (IRO), Metrolinx engages with Indigenous communities on all projects on an ongoing basis. The following presents an overview of the engagement that has taken place with Indigenous communities to-date in support of the Project.

Metrolinx consults with Indigenous communities with respect to the Constitution Act of Canada (Section 35) and as part of EA requirements. Metrolinx's Duty to Consult is triggered when Metrolinx is contemplating an action or decision that may have the potential to adversely impact aboriginal and/or Treaty rights, Often Metrolinx is engaging and consulting with Indigenous communities to fulfill both consultation requirements and EA requirements. Elements of fulfilling the Duty to Consult do not change based on EA requirements and include but are not limited to: regular communication with Indigenous communities as the project progresses, meetings with leadership, members, and consultation offices within Indigenous communities, and identifying accommodation measures to avoid, mitigate and/or minimize adverse impacts on aboriginal and/or Treaty rights.

7.6.1 Background

In 2018, Metrolinx made a commitment to build positive and meaningful relationships with Indigenous Peoples, in alignment with its strategic objectives. To that end, the Indigenous Relations Office (IRO) was established in 2019 with a mandate to build and grow relationships with Indigenous communities, organizations, businesses and customer-residents. As part of this work, the IRO provides guidance to the organization with respect to engaging Indigenous communities on projects and is dedicated to

working towards establishing and maintaining meaningful relationships with Indigenous communities.

In 2020, the IRO became the sole point of contact for Indigenous communities within Metrolinx and, in that capacity, supports the organization in coordinating engagement and communication with Indigenous communities related to all projects and Metrolinx activities.

7.6.2 Engagement with Indigenous Communities

The IRO is working to identify best practices for engagement and/or consultation with each Indigenous community that may have aboriginal and/or Treaty rights where Metrolinx operates and/or that may have an interest in Metrolinx projects. General feedback from Indigenous communities regarding Metrolinx's current engagement approach includes:

- Ensure consistent, timely and transparent communication through a single point of contact.
- Ensure appropriate engagement across the project lifecycle, with a specific focus on review and participation in natural environment, cultural heritage, archaeological studies and reports, and the development of mitigation and compensation plans as well as environmentally or culturally sensitive construction activities.
- Indigenous communities cannot keep pace with the growing volume of engagement from Metrolinx and, in some cases, do not have the in-house technical expertise to facilitate meaningful review and comment on project materials. As such, many Indigenous communities have requested that Metrolinx consider long term relationship and capacity building through regular meetings, evaluation of funding requests and negotiation of relationship framework agreements.

Metrolinx recognizes that meaningful engagement with Indigenous communities requires moving beyond simply sharing information regarding project milestones and technical reports that are largely related to the Environmental Assessment process, and is actively working toward deeper engagement with Indigenous communities on matters of interest to each community – including, but not limited to, natural environment, heritage and cultural resources, and other environmentally sensitive activities across the entire project lifecycle.

As an interim step, Metrolinx is putting processes in place to streamline communication and limit the administrative burden placed on Indigenous communities by:

- Establishing the IRO as the single point of contact within Metrolinx to coordinate the timing of communications across projects and limit the number of Metrolinx staff that contact Indigenous communities

- Preparing and sending monthly forecasts consolidating requests for feedback and reminders of deadlines to help Indigenous communities to plan for upcoming engagement activities
- Establishing administrative tools and strategies for sharing and tracking the review of materials and associated comments
- Building meaningful relationships through standing monthly meetings

The nature of establishing a single point of contact for Indigenous communities across all Metrolinx projects often means that engagement can occur in both formal and informal ways, which are summarized below.

7.6.3 List of Indigenous Communities

The IRO supported the development of a list of potentially interested Indigenous communities for the Project which, as per O. Reg. 231/08, was sent to the MECP for feedback and approval on April 7, 2021, which MECP responded on June 14, 2021 confirming the Indigenous communities list and provided an official letter on June 22, 2021. The following Indigenous communities were identified as being potentially interested in the Project:

- Williams Treaties First Nations
  - Alderville First Nation
  - Beausoleil First Nation
  - Chippewas of Georgina Island
  - Chippewas of Rama First Nation
  - Curve Lake First Nation
  - Hiawatha First Nation
  - Mississaugas of Scugog Island First Nation
- Huron-Wendat Nation
- Kawartha Nishnawbe First Nation
- Métis Nation of Ontario

7.6.4 Summary of Notices and Reports

As part of engagement for the Project, the IRO shared the following Project notices and reports with identified Indigenous communities:

- Project Introduction Letter and Invitation to Participate on March 25, 2021
- Draft Stage 1 AA on August 10, 2021
- Invitation for Stage 2 AA fieldwork participation on September 21, 2021
- Draft Tree Inventory Technical Report, Arborist Report and Cultural Heritage Report on October 22, 2021
- Draft Natural Environment Report, Cultural Heritage Evaluation Report, and Draft Cultural Heritage Evaluation Cultural Heritage Evaluation Recommendations Report for Albert Street Bridge and Farewell Street Multi-Use Bridge on December 9, 2021
- Draft Limited Phase I ESA on March 17, 2022
- Project Updates and Invitations to Participate in Arborist, Tree Inventory, Natural Environment, and Stage 2 AA Fieldwork on April 21, 2022
- Draft EPR Addendum (including Appendices) on May 10, 2022
- Project Updates for the Stage 2 AA, Stage 2 AA test pit survey dates; and an invitation to participate in the Stage 2 AA fieldwork on June 28, 2022
- Project Updates for the Stage 2 AA fieldwork and invitation for it on August 3, 2022
- Fieldwork update for Stage 2 AA fieldwork on August 18, 2022
- Fieldwork update for Stage 2 AA fieldwork on October 21, 2022
- Project Update Letter on April 18, 2023 and May 9, 2023
- Draft Cultural Heritage Report, Stage 1 AA and draft Stage 1 AA for Updated Footprint for review on May 11, 2023
- The Notice of Virtual Public Information Centre to be held virtually from June 8 to June 21, 2023 was sent on May 17, 2023
- Invitation for Stage 2 AA fieldwork on May 29, 2023
- Fieldwork update for Stage 2 AA on June 7, 2023
- Invitation for Stage 2 AA fieldwork on June 8, 2023

- Invitation for Stage 2 AA fieldwork on June 15, 2023
- Fieldwork update for Stage 2 AA on June 16, 2023
- Fieldwork update for Stage 2 AA on July 17, 2023
- Invitation for Stage 2 AA fieldwork on July 27, 2023
- Fieldwork update for Stage 2 AA on August 1, 2023
- Invitation for Stage 2 AA fieldwork on August 16, 2023

Although the Huron Wendat have no treaties in Ontario, there have been many large and significant archaeological sites that attest to their historical presence in Ontario. Huron Wendat have primary and secondary areas of interest in Huron-Sud as well as archaeological sites. The project area falls within the primary area of interest indicated by the Huron Wendat. Huron Wendat were contacted and were provided with the project information and areas of potential archaeological impact as well as summary of fieldwork findings / progression.

7.6.4.1 Summary of Feedback

The following feedback was received:

- On March 28, 2021, Huron-Wendat Nation confirmed they have an interest in participating in fieldwork.
- On September 23, 2021, Huron-Wendat Nation provided comments on the draft Stage 1 AA, noting it adequately contextualizes the study areas but requested some modifications to the text.
- On September 28, 2021, Huron-Wendat Nation confirmed they have an interest in participating in Stage 2 AA fieldwork.
- On October 26, 2021, Mississaugas of Scugog Island First Nation submitted questions on bat habitat compensation and surveys, and if Indigenous Cultural Heritage Landscapes have been considered.
- On November 26, 2021, Chippewas of Rama First Nation asked if a tree replacement plan has been developed at this time related to the Tree Inventory, Arborist Report, and CHR that was sent out by Metrolinx.
- On December 7, 2021, Curve Lake First Nation provided comments on the draft Tree Inventory Report, Arborist Report and Cultural Heritage Report.

- On December 17, 2021, Chippewas of Rama First Nation confirmed they do not have any comments on the proposed activity but wish to be informed as the development of the Project continues.
- On February 3, 2022 Curve Lake First Nation provided comments on the Natural Environment Technical Report and impacts, mitigation, and monitoring.
- On March 16, 2022, Chippewas of Rama First Nation requested additional information regarding actions to protect existing trees and replenish trees that have been removed.
- On April 21, 2022, Huron-Wendat Nation confirmed they have interest in participating in Arborist, Tree Inventory, Natural Environment, and Stage 2 AA fieldwork and would like to complete construction monitoring work as needed.
- On April 21, 2022, Curve Lake First Nation confirmed they would like to tentatively accept participation in the Stage 2 AA fieldwork but cannot guarantee a liaison at this time.
- On April 28, 2022, Curve Lake First Nation confirmed they reviewed the Limited Phase I ESA and have no comments at this time but recommends if additional site inspections, investigations or sampling is required that Curve Lake First Nation is invited to attend.
- On June 21, 2022, Curve Lake First Nation provided comments on the draft EPR Addendum including requests that Oral histories and Traditional Land Use Studies be included as part of the Project and requested that site restorations and plantings be approved by Curve Lake First Nation.
- On June 22, 2022, Mississaugas of Scugog Island First Nation provided comments on the draft EPR Addendum, including requesting additional information regarding construction fencing, post-construction habitat restorations and requests to be included in discussions regarding potential habitat connectivity resulting from the Project. On July 14, 2023, Metrolinx provided a response to comments on the draft EPR Addendum, which included updated mitigation measures and noted that the Mississaugas of Scugog Island First Nation will be invited for further discussions regarding potential habitat connectivity opportunities.
- On June 28, 2022, Mississaugas of Scugog Island First Nation confirmed they do not have any archaeological monitors to send at this time. However, they requested to be apprised of the work being completed for the Project.
- On July 11, 2022, Chippewas of Georgina Island asked if it would be possible to get a map where the listed properties for the Stage 2 AA test pit surveys are located so they can prioritize their site visits.

- On July 25, 2022, Curve Lake First Nation confirmed they don't have a liaison available for the Stage 2 AA test pit survey dates that were shared on June 28, 2022.
- On August 3, 2022, Curve Lake First Nation confirmed they received the reminder of the fieldwork dates from August 3, 2022, to September 30, 2022.
- On August 13, 2022, Curve Lake First Nation provided comments from their June 27, 2022, site visit with Metrolinx, including reference to Indigenous Knowledge and Project recommendations.
- On October 24, 2022, Huron-Wendat Nation confirmed they would like to have a monitor on site for the Stage AA fieldwork dates as outlined in an email sent out on October 21, 2022.
- On April 19, 2023, Mississaugas of Scugog Island First Nation confirmed they would like to review all of the Cultural Heritage Evaluation Reports.
- On May 11, 2023, Alderville First Nation requested to have a meeting to review the draft Cultural Heritage Report, Stage 1 AA and draft additional Stage 1 AA for Updated Footprint. On June 26, 2023 Metrolinx met with Alderville First Nation and provided an overview of the Project
- On May 18, 2023, Mississaugas of Scugog Island First Nation requested information on how to attend the Virtual Public Information Centre. On May 18, 2023 Metrolinx confirmed there is a link available to register for the event on the Project website.

7.6.5 Archaeology

Metrolinx recognizes the significance of archaeology to many Indigenous communities. As such, Metrolinx endeavors to offer opportunities for participation of Indigenous communities in archaeological fieldwork. Metrolinx has also made commitments to share archaeological reports with Indigenous communities for feedback in draft form prior to submission to the MCM and to offer opportunities for Indigenous communities to participate in archaeological field work monitoring for the Project. Metrolinx aims to incorporate comments and feedback from Indigenous communities into archaeological reports.

Metrolinx made a commitment to Indigenous communities to include Indigenous monitors in Stage 2 archaeological fieldwork being completed for the Project. Metrolinx sent invitations to participate in the summer 2022 and 2023 fieldwork and continues to share regular updates with Indigenous communities who are interested in participating.

Indigenous communities were sent the following archaeological reports for review and comment and invitations for field work:

- Project Addendum Introduction and Invitation for Participation in the Stage 2 AA – March 25, 2021
- Draft Stage 1 AA – August 10, 2021
- Project Update – Invitation for Participation in the Stage 2 AA – September 21, 2021
- Project Update – Invitation for Participation in the Stage 2 AA – April 21, 2022
- Project Update – Follow up for Invitation for Participation in Stage 2 AA – June 28, 2022
- Project Update – Follow up for Invitation for Participation in Stage 2 AA – August 3, 2022
- Fieldwork Update – Delay of Stage 2 AA Fieldwork – August 18, 2022
- Fieldwork Update – Delay of Stage 2 AA Fieldwork – October 21, 2022
- Stage 1 AA and draft Stage 1 AA for Updated Footprint – May 11, 2023
- Invitation to Participate in Stage 2 AA Fieldwork – April 14, 2023
- Invitation for Stage 2 AA fieldwork on May 29, 2023
- Fieldwork update for Stage 2 AA on June 7, 2023
- Invitation for Stage 2 AA fieldwork on June 8, 2023
- Invitation for Stage 2 AA fieldwork on June 15, 2023
- Fieldwork update for Stage 2 AA on June 16, 2023
- Fieldwork update for Stage 2 AA on July 17, 2023
- Invitation for Stage 2 AA fieldwork on July 27, 2023
- Fieldwork update for Stage 2 AA on August 1, 2023
- Invitation for Stage 2 AA fieldwork on August 16, 2023

7.6.5.1 Feedback

The following feedback was received regarding archaeology:

- On March 28, 2021, Huron-Wendat Nation confirmed they have an interest in participating in archaeological field work.

- On September 23, 2021, Huron-Wendat Nation provided comments on the draft Stage 1 AA, noting it adequately contextualizes the Study Area but requested some modifications to the text. Subsequently, adjustments to the Stage 1 AA have been made to address Huron-Wendat Nation's comment.
- On September 28, 2021, Huron-Wendat Nation confirmed they would participate in archaeological field work. The Stage 2 AA work was originally rescheduled due to weather and scheduling conflicts.
- On April 21, 2022, Huron-Wendat Nation confirmed they have interest in participating in archaeological field work and would like to complete construction monitoring work as needed.
- On April 21, 2022, Curve Lake First Nation confirmed they would like to tentatively accept participation in the Stage 2 AA but cannot guarantee a liaison at this time.
- On June 28, 2022, Mississaugas of Scugog Island First Nation confirmed they do not have any archaeological monitors to attend field work but requested to be informed of the work taking place.
- On July 11, 2022, Chippewas of Georgina Island requested confirmation regarding location of properties for the Stage 2 AA fieldwork. On July 22, 2022, Metrolinx provided an updated schedule and list detailing the property locations of the Stage 2 AA fieldwork.
- On July 25, 2022, Curve Lake First Nation confirmed they do not have a liaison available for the Stage 2 AA test pit survey dates that were shared on June 28, 2022.
- On August 3, 2022, Curve Lake First Nation confirmed they received the reminder of the fieldwork dates from August 3, 2022 to September 30, 2022.
- On October 24, 2022, Huron-Wendat Nation confirmed they would like to have a monitor on site for the Stage 2 AA fieldwork dates as outlined in an email sent out on October 21, 2022.
- On April 27, 2023, Huron-Wendat Nation confirmed they would like to participate in Stage 2 AA fieldwork monitoring on dates outlined in an email sent on April 14, 2023.
- On May 11, 2023, Alderville First Nation requested to have a meeting to review the draft Cultural Heritage Report, Stage 1 AA and draft additional Stage 1 AA for Updated Footprint.

- On August 21, 2023, Huron-Wendat Nation participated in Stage 2 AA fieldwork monitoring.

7.6.6 Cultural Heritage

Metrolinx recognizes the significance of cultural heritage to many Indigenous communities. As such, Metrolinx offers opportunities for Indigenous communities to participate in and provide feedback on draft Cultural Heritage studies prior to submission to the MCM. Metrolinx aims to incorporate comments and feedback from Indigenous communities into cultural heritage assessments.

Indigenous communities were sent the following reports for review and comment:

- Draft Cultural Heritage Report on October 22, 2021
- Draft Cultural Heritage Evaluation Report and Cultural Heritage Evaluation Recommendations Report for Albert Street Bridge and Farewell Street Multi-Use Bridge on December 9, 2021
- Draft Cultural Heritage Report for review on May 11, 2023
- Draft Cultural Heritage Evaluation Reports for 83 Avenue Street, 349 Ritson Road, 356 Ritson Road, 359 Ritson Road, 374 Farewell Street, 394 Simcoe Street South, 399 Simcoe Street South, 464 Ritson Road, 470 Ritson Road, 1490 Baseline Road, 1598 Baseline Road, 1558/1580 Baseline Road, 1604 Baseline Road, 1766 Baseline Road, 2228 Baseline Road, St. Wolodymyr and St. Olha Ukrainian Cemetery were provided to Mississaugas of Scugog Island First Nation on May 5, 2023[53]

7.6.6.1 Feedback

The following feedback was received regarding cultural heritage:

- On October 26, 2021, Mississaugas of Scugog Island First Nation provided comments on the draft Cultural Heritage Report including a question about whether Indigenous Cultural Heritage Landscapes had been considered as part of the report. On June 9, 2022, Metrolinx replied that based on a review of publicly available material and fieldwork, no Indigenous Cultural Heritage Landscapes were identified and invited the Mississaugas of Scugog Island First Nation to assist with the identification of Indigenous Cultural Heritage landscapes within the Study Area. On

[53] Indigenous communities were contacted to advise if there was an interest in reviewing the Cultural Heritage Evaluation Reports; only those that requested a review opportunity were provided the reports.

May 4, 2023, the Mississaugas of Scugog Island First Nation requested to review all 14 CHER reports, Metrolinx provided the reports on May 5, 2023.

- On December 7, 2021, Curve Lake First Nation provided comments on the draft Cultural Heritage Report including on the assessment of Cultural Heritage Landscapes of value to Indigenous communities. On July 21, 2022, Metrolinx responded and confirmed that they will incorporate relevant and historical information into the Cultural Heritage Report. Metrolinx also requested any relevant Indigenous worldview information from Curve Lake First Nation that could be incorporated into the Cultural Heritage Report.

- On December 17, 2021, Chippewas of Rama First Nation confirmed they do not have any comments on the proposed activity but wish to be informed as the development of the Project continues.

- On May 11, 2023, Alderville First Nation requested to have a meeting to review the draft Cultural Heritage Report, Stage 1 AA and draft additional Stage 1 AA for Updated Footprint. On June 26, 2023, Metrolinx met with Alderville First Nation to discuss Metrolinx-wide projects. A general overview of the Oshawa to Bowmanville Rail Service Extension was presented. On August 9, 2023, Alderville also mentioned cultural heritage landscapes have been obliterated, very European-centric and expressed a need for truth telling. Metrolinx agreed to developing a collaborative approach with Alderville to capture the community's perspective on future Metrolinx project's cultural heritage reporting.

7.6.7 Natural Environment

During the course of this Project, Metrolinx learned that several Indigenous communities had an interest in natural environment studies (including tree inventory / arborist work) and construction monitoring. Metrolinx committed to providing more opportunities for Indigenous communities to participate in such activities for the Project.

Indigenous communities were sent the following reports for review and comment and invitations for field work:

- Invitation for Curve Lake First Nation to Participate in Natural Environment Surveys – June 16, 2021

- Draft Tree Inventory Report – October 22, 2021

- Draft Natural Environment Report – December 9, 2021

- Project Update – Invitation for Participation in the Arborist, Tree Inventory and Natural Environment Fieldwork – April 21, 2022

7.6.7.1 Feedback

The following feedback was received regarding natural environment, tree inventory and arborist reports:

- On October 26, 2021, Mississaugas of Scugog Island First Nation submitted questions on bat habitat compensation and surveys. On June 9, 2022, Metrolinx provided additional information on bat survey methodologies.
- On November 26, 2021, Chippewas of Rama First Nation asked if a tree replacement plan had been developed. On March 16, 2022, Metrolinx confirmed that during the detailed design process, an arborist report will be undertaken to identify areas suitable for landscaping, restoration and compensation. Metrolinx also confirmed that they will plant species native to the area and will work with interested rightsholders and stakeholders prior to implementation.
- On December 7, 2021, Curve Lake First Nation provided comments on the draft Arborist Report and Tree Inventory Technical Report including a request that Curve Lake First Nation participate during construction monitoring and comment to use ornithologist or wildlife biologist instead of a bird specialist.
- On December 17, 2021, Chippewas of Rama First Nation confirmed they do not have any comments on the proposed activity but wish to be informed as the development of the Project continues.
- On February 3, 2022, Curve Lake First Nation provided additional comments on the Natural Environmental Technical Report, including the context of the reporting, lack of a traditional knowledge study, presence of American Eel and American Brook Lamprey in Oshawa Creek, and lack of site visit for Curve Lake First Nation.
- On March 16, 2022, Chippewas of Rama First Nation requested additional information regarding actions to protect existing trees and replenish trees that had been removed. On March 25, 2022, Metrolinx responded and confirmed that this work has not yet been completed, however as detailed design progresses, Metrolinx will be undertaking an Arborist Report to identify areas suitable for landscaping, restoration and compensation.
- On April 21, 2022, Huron-Wendat Nation confirmed they would like to participate as construction monitors, as needed.
- On June 21, 2022, Curve Lake First Nation provided comments on the draft EPR Addendum including requests that oral histories and traditional land use studies be included as part of the Project and requested that site restorations and plantings be approved by Curve Lake First Nation.

- On June 22, 2022, Mississaugas of Scugog Island First Nation provided comments on the draft EPR Addendum, including requesting additional information regarding construction fencing, post-construction habitat restorations and requests to be included in discussions regarding potential habitat connectivity resulting from the Project.

- On July 21, 2022, Metrolinx replied to Curve Lake First Nation's December 7, 2021, and February 3, 2022 letters. Metrolinx confirmed that they will continue to engage with Curve Lake First Nation during detailed design, compensation will be provided for the removal of vegetation, and temporarily disturbed areas will be re-vegetated using native plants appropriate to the site conditions. Metrolinx also requested any relevant Indigenous worldview information from Curve Lake First Nation that could be incorporated into the Natural Environment Technical Report. A site visit with Curve Lake First Nation occurred on June 27, 2022. On January 8, 2023, Metrolinx responded to Curve Lake First Nation by sharing datasets (CLOCA and MNRF) related to the Project that were discussed during an in-person meeting on September 20, 2022.

- On August 9, 2023, Alderville expressed interest in learning about impact on native fish species, and requested insights into if wildlife corridors could be installed along tracks in future Metrolinx projects. Metrolinx confirmed all fisheries related information was provided from Conservation Authorities and the MNRF. Alderville also requested information regarding what happens to cut trees. Metrolinx confirmed that the outcome depends on the tree species as per the 2022 Metrolinx Vegetation Guide, however would be open to providing the community with logs, if requested.

7.6.8 Limited Phase I Environmental Site Assessment

During the course of this Project, Metrolinx has learned that several Indigenous communities have an interest in the Limited Phase I ESA. Metrolinx is committed to ensuring opportunities for Indigenous communities to participate in providing feedback on reports.

Indigenous communities were sent the following report for review and comment:

- Draft Limited Phase I ESA – March 17, 2022

7.6.8.1 Feedback

The following feedback was received regarding the Limited Phase I ESA:

- On April 28, 2022, Curve Lake First Nation confirmed they reviewed the Limited Phase I ESA and had no comments, but recommended if additional site inspections, investigations or sampling is required that Curve Lake First Nation be invited to participate.

7.6.9 Meetings

The IRO facilitated the following meetings to discuss the Project:

- Curve Lake First Nation – June 29, 2021
- Curve Lake First Nation – October 26, 2021
- Curve Lake First Nation – November 23, 2021
- Curve Lake First Nation – April 26, 2022
- Mississaugas of Scugog Island First Nation – May 10, 2022
- Curve Lake First Nation – May 17, 2022
- Curve Lake First Nation (Site Visit) – June 27, 2022
- Curve Lake First Nation - September 20, 2022
- Alderville First Nation – June 26, 2023
- Alderville First Nation – August 9, 2023

Meeting minutes are not included as part of the record of consultation as these discussions are sensitive and confidential.

7.6.10 Formal Feedback

Throughout the TPAP, comments were received from Indigenous communities. A high-level summary of key comments and Metrolinx responses are presented in Table 7.12, below.

Table 7.12: Key Comments from Indigenous Communities

Indigenous Community	Formal Feedback	Metrolinx Response
Alderville First Nation	Alderville First Nation requested a meeting to review the draft Cultural Heritage Report, Stage 1 AA and draft additional Stage 1 AA for Updated Footprint.	• Metrolinx held a meeting on June 26, 2023 to provide a general overview of the Project. • Metrolinx held a meeting on August 9, 2023 to discuss the Project. Topics discussed included a general Project overview including natural environment, cultural heritage and tree inventory technical studies.
Beausoleil First Nation	To date, Beausoleil First Nation has not communicated or expressed concerns to Metrolinx about the Project.	• Metrolinx continues to welcome opportunities to meet with Beausoleil First Nation to discuss the Project; Metrolinx continues to provide information, updates and technical reports to Beausoleil First Nation and extend invitations to archaeological and environmental field work.
Chippewas of Georgina Island	The Chippewas of Georgina Island has requested additional information regarding the locations for the Stage 2 AA fieldwork.	• Metrolinx provided locations of the Stage 2 AA fieldwork.

Indigenous Community	Formal Feedback	Metrolinx Response
Chippewas of Rama First Nation	Chippewas of Rama First Nation has submitted comments to Metrolinx regarding tree protection and replacement plans.	• Metrolinx appreciated Chippewas of Rama First Nation's feedback and confirmed that during detailed design an Arborist Report will be completed to identify areas suitable for landscaping, restoration and compensation. Metrolinx continues to provide information, updates and technical reports to Chippewas of Rama First Nation and extend invitations to archaeological and environmental field work.
Curve Lake First Nation	Curve Lake First Nation has submitted comments to Metrolinx regarding the following: • corrected mis-use of the term bird specialist • concern with the cultural heritage values or interests of Indigenous communities included in the Cultural Heritage Report • request to approve site restorations and planting plans • requested invitation to additional site inspections, investigations or sampling • oral histories and traditional land use studies to be included as part of the Project • shared Indigenous Knowledge and Project recommendations from their site visit on June 27, 2022	• Metrolinx appreciates Curve Lake First Nation's feedback and will work to incorporate its comments into the Project reports, as applicable. Metrolinx requested Curve Lake First Nation provide relevant Indigenous worldview information that could be included in the Project reports. Metrolinx continues to welcome opportunities to meet with Curve Lake First Nation to discuss the Project. Metrolinx continues to provide information, updates and technical reports to Curve Lake First Nation and extend invitations to archaeological and environmental field work.

Indigenous Community	Formal Feedback	Metrolinx Response
Hiawatha First Nation	To date, Hiawatha First Nation has not expressed concerns to Metrolinx about the Project.	• Metrolinx continues to welcome opportunities to meet with the Hiawatha First Nation to discuss the Project; Metrolinx continues to provide information, updates and technical reports to the Hiawatha First Nation and extend invitations to archaeological and environmental field work.
Mississaugas of Scugog Island First Nation	Mississaugas of Scugog Island First Nation has submitted comments to Metrolinx regarding the following: • commented on whether habitat value of dead standing trees to bats had been considered • commented on whether Indigenous Cultural Heritage Landscapes had been considered in the Cultural Heritage Report • construction fencing and post-construction habitat restorations • request to be included in discussions regarding habitat connectivity	• Metrolinx requested information regarding Indigenous cultural heritage landscapes to be included in the Project reports. Metrolinx appreciates Mississaugas of Scugog Island First Nation's feedback Metrolinx continues to welcome opportunities to meet with Mississaugas of Scugog Island First Nation to discuss the Project. Metrolinx continues to provide information, updates and technical reports to Mississaugas of Scugog Island First Nation and extend invitations to archaeological and environmental field work.

Indigenous Community	Formal Feedback	Metrolinx Response
Huron-Wendat Nation	Huron-Wendat Nation has submitted comments to Metrolinx regarding the Historical Context and Pre-Contact Indigenous Resource sections of the Stage 1 AA.	• Metrolinx appreciates Huron-Wendat Nation's feedback and will work to incorporate its comments into the Project reports, as applicable. Metrolinx continues to welcome opportunities to meet with Huron-Wendat Nation to discuss the Project. Metrolinx continues to provide information, updates and technical reports to Huron-Wendat Nation and extend invitations to archaeological and environmental field work.
Kawartha Nishnawbe First Nation	To date, Kawartha Nishnawbe First Nation has not expressed concerns to Metrolinx about the Project.	• Metrolinx continues to welcome opportunities to meet with the Kawartha Nishnawbe First Nation to discuss the Project; Metrolinx continues to provide information, updates and technical reports to the Kawartha Nishnawbe First Nation and extend invitations to archaeological and environmental field work.
Métis Nation of Ontario	To date, Métis Nation of Ontario has not expressed concerns to Metrolinx about the Project.	• Metrolinx continues to welcome opportunities to meet with the Métis Nation of Ontario to discuss the Project; Metrolinx continues to provide information, updates and technical reports to the Métis Nation of Ontario and extend invitations to archaeological and environmental field work.

7.6.11 Additional Engagement

In addition to the formal engagement outlined above, the IRO contacted or communicated with Indigenous communities on the Project through:

- Forecasting upcoming communication across all projects to each Indigenous community on a monthly basis
- Providing regular email reminders to each Indigenous community regarding deadlines across all projects
- Receiving feedback and answering questions over the phone or during non-project specific meetings or engagements

Consultation with Indigenous communities will continue as planning progresses. Correspondence records are provided in Appendix B.

7.7 Notice of EPR Addendum

On September 28, 2023, Metrolinx sent the Notice of EPR Addendum to Indigenous communities. On September 29, 2023, the Notice of EPR Addendum was sent to government agencies, municipal and regional staff. The notice was also issued in different media as summarized in Table 7.13, including bulk mailout, newspaper publication and electronic media.

On October 3, 2023, Metrolinx sent the Notice of EPR Addendum to elected officials. On October 5, 2023, the Notice of EPR Addendum was sent to stakeholders who had expressed interest to be notified and to the e-newsletter subscribers. A reminder email was also sent to municipal staff and elected officials on October 5, 2023 that the EPR Addendum was available for review and comment. The Notice of EPR Addendum includes information about the Project and TPAP as well as how to provide comments. A copy of the Notice of EPR Addendum is provided in Appendix B11.

Table 7.13: Publication Details for Notice of EPR Addendum

Media	Date of Publication	Audience
Digital Newspapers (www.durhamregion.com and www.thestar.com)	October 5, 2023	General public
Email	September 28, 2023	Indigenous communities
	September 29, 2023	Government agencies
	September 29 and October 5, 2023	Municipal and regional staff (City of Oshawa, Municipality of Clarington and Regional Municipality of Durham)
	October 3 and 5, 2023	Elected officials
	October 5, 2023	Project contact list, e-newsletter subscribers, those who requested to be added to the email list through the Virtual Public Information Centre.

Media	Date of Publication	Audience
Bulk mailout	October 3, 4 and 5, 2023 (estimated)	Property owners within approximately 800 m of the rail corridor
www.metrolinx.com/bowmanville	October 5, 2023	General public, interested parties

7.7.1 30-Day Public Review

Upon issuing the Notice of EPR Addendum, the Final EPR Addendum and environmental technical reports were made available for a 30-day review period by the public, Indigenous communities and stakeholders. The EPR Addendum and environmental technical reports will be posted online on the Metrolinx Project website.

During the 30-day review period, if concerns pertaining to the potential of negative effects on a matter of Provincial importance according to *O. Reg. 231/08* that relates to natural environment or cultural value or interest, or protected aboriginal or Treaty rights, an objection may be submitted to the Minister of Environment, Parks and Conservation (the Minister) as outlined in the Notice of EPR Addendum.

The 30-day review period is anticipated to begin on October 5, 2023 and conclude on November 6, 2023.

7.7.2 35-Day Ministers Review

Following the 30-day public review period, the Minister has 35-days to review the EPR Addendum, received concerns and issue on of three notices:

- proceed with the Project in accordance with the EPR Addendum; or
- proceed with the Project in accordance with the EPR Addendum subject to conditions; or
- require the proponent to conduct further work and submit a revised EPR Addendum

The 35-day review period is anticipated to begin on November 7 and finish on December 12, 2023.

8.0 Permits and Approvals, and Commitments and Future Work

All applicable permits, licenses, approvals and monitoring requirements under environmental laws will be reviewed, confirmed and obtained by Metrolinx prior to the construction of the Project. An outline of key legislation and regulations that are anticipated to apply to the proposed Project are outlined below. These will be confirmed prior to commencing construction. A detailed list of potentially applicable permits and approvals requirements that will be confirmed during detailed design is provided in Section 8.3.

8.1 Impact Assessment Act

The Physical Activities Regulations under the *Impact Assessment Act* (IAA*)* identify the physical activities (i.e., types of projects) that constitute "designated projects" that may require a Federal Impact Assessment. A review of the Regulations was carried out by Metrolinx with respect to the Project. Based on this review, this Project does not constitute a designated project under the IAA.

The IAA also outlines requirements for determination of the likelihood of significant environmental effects for a physical activity that is carried out on federal lands, or outside of Canada, in relation to a physical work and that is not a designated project (Section 82 of IAA*)*. All of the proposed work for the Project will be carried out on lands currently owned or that will be purchased by Metrolinx, and lands that Metrolinx has agreements for such as the CP Rail corridor. As such, the requirements under the IAA do not apply.

8.2 Permits and Approvals

In accordance with *O. Reg. 231/08*, a Notice to Proceed will be issued by the MECP if there are no outstanding issues on a matter of provincial importance that relates to the natural environment, cultural heritage/interest, or on a constitutionally protected aboriginal or Treaty rights. In addition to carrying out the TPAP in accordance with *O. Reg. 231/08*, there are also a number of other provincial, municipal, and other permits/approvals required for the Project prior to implementation. Accordingly, the following section summarizes the anticipated permits and approvals based on the proposed work and input received from the public, stakeholders, and Indigenous communities to date.

In addition to the commitments to future work outlined in Section 8.5, permits and approvals obtained for the proposed works, as outlined in the following sections, may identify the need for additional mitigation. Any additional mitigation measures required in connection with a permit or approval shall be implemented.

8.2.1 Federal

At the time of publication, the following federal regulations are expected to be triggered by the Project:

- Transport Canada, *Railway Safety Act*
- Transport Canada, *Canadian Navigable Waters Act, 2019*
- DFO, *Fisheries Act*

Migratory bird species listed in the *Migratory Birds Convention Act, 1994* (MBCA) and listed as extirpated, endangered or threatened on Schedule 1 of the *Species at Risk Act, 2002* (SARA) are regulated under the SARA. Should construction result in potential impacts to a regulated migratory bird species, consultation with ECCC is recommended to confirm authorization requirements under the SARA. Contravention of the SARA can be avoided by implementing measures (i.e., construction and operational maintenance activities outside of breeding bird timing window) to prevent the disturbance, destruction or taking of a nest as described for the MBCA (refer to Section 8.4 for further details); as such neither SARA nor MBCA are listed in Table 8.1 below.

8.2.2 Provincial

At the time of publication, the following provincial permits / approvals / requirements have been identified as required for the Project:

- MECP, Notice to Proceed
- MECP, Environmental Activity Sector Registry (EASR)
- MECP, Permit to Take Water (PTTW)
- MECP, Environmental Compliance Approval (ECA) (Industrial Sewage)
- MECP, ECA (Air)
- MECP, Drinking Water Works Permit
- MECP, Requirements for Addressing Contaminants
- MECP, Excess Waste Removal

- MECP, On-Site and Excess Soil Management
- MECP, *Endangered Species Act, 2007* (ESA, 2007)
- MNRF, License to Collect Fish of Scientific Purposes
- MNRF, Wildlife Scientific Collector's Authorization MNRF, Authorization or Tenure under the *Public Lands Act*
- MCM, AA Review Letters
- Ministry of Labour, Notice of Project
- Ministry of Government and Consumer Services, Notification

Table 8.1 provides a list of other potentially applicable approvals. As the Project proceeds the provincial permit and approval requirements shall continue to be assessed and addressed.

8.2.3 Conservation Authority

Note that, Metrolinx as a Crown Agency of the Province of Ontario is not subject to the *Conservation Authorities Act (CAA)*. However, Metrolinx will engage with CLOCA to incorporate their requirements as a best practice, where practical, and may obtain associated permits and approvals if agreement is reached with CLOCA to facilitate their review.

Communication and engagement with the CLOCA will continue as design and construction planning progress to address matters related to their mandate.

8.2.4 Municipal

A range of municipal permits and approvals may be required for the Project, particularly as pertaining to municipally owned lands and infrastructure. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

Water, sanitary, and storm servicing will be reviewed during detailed design. The City of Oshawa, Municipality of Clarington and Regional Municipality of Durham will be consulted during detailed design to address impacts to municipal water, sanitary, and storm sewer systems.

Communication and engagement with the municipalities shall continue as design and construction planning progress to address municipal interests.

8.2.5 Utilities

Coordination with the City of Oshawa, Municipality of Clarington, Regional Municipality of Durham and relevant utilities will be undertaken as design and construction planning progress. Potential utility conflicts shall be reviewed in consultation with each utility company as part of detailed design. Implementation and construction obligations shall be undertaken pursuant to the crossing agreements with each of the utility companies as required. Any associated permits and approvals will be obtained prior to construction.

8.3 Summary of Permits and Approvals

A preliminary list of the potentially applicable permitting and approval requirements for the Project are identified in Table 8.1. Permits/approvals required for Project Components are denoted by a "●". If no permits/approvals are anticipated for a Project component, a "-" is indicated. Additional requirements may be identified or confirmed during detailed design, or as ongoing consultation progresses. All required permits and approvals shall be obtained, and the Project completed in accordance with applicable law. The required permits and approvals shall be obtained prior to the associated work commencing. Permits and approvals obtained for the proposed works, as outlined in the following sections, may identify the need for additional mitigation. Any additional mitigation measures required in connection with a permit or approval shall be implemented.

Table 8.1: Potential Permitting, Approvals, and Other Permissions

Jurisdiction	Permit/Approval Name	Regulatory Authority	Legislation & Regulation	Project Components									Description of Project Activities that may Require Permits or Approvals
				Trackwork	B1 Thornton's Corners East GO Station	B2 Ritson GO Station	B3 Courtice GO Station	B4 Bowmanville GO Station	Bridges	At-Grade Crossing Widenings	Ancillary Structural Work	Utilities	
Federal	Notice of Certain Proposed Railway Works	Transport Canada	*Railway Safety Act*	●	-	-	-	-	●	●	-	-	Approval must be obtained before the Project can proceed to implementation.
	Notice under *Canadian Navigable Waters Act*	Transport Canada	*Canadian Navigable Waters Act* Section 9 and Section 10	-	-	-	-	-	●	-	-	-	Required for works that include construction, alteration, removal or decommission in, on, over, under, through or across any navigable water.
	Fisheries Act Authorization and/or Request for Review	DFO	*Fisheries Act* paragraph 35(2)(b)	-	-	-	-	-	●	-	-	-	Required if there is the potential for Project Activities to result in the death of fish or harmful alteration, disruption or destruction of fish habitat including Species at Risk (SAR) and impacts to Indigenous communities.
Provincial	Notice to Proceed	MECP	*Environmental Assessment Act* O. Reg 231/08 (Transit Projects & Metrolinx Undertakings)	●	●	●	●	●	●	●	●	●	Must be obtained before the Project can proceed to implementation. The Project meets the definition of a transit project under *O. Reg 231/08* and is subject to the Transit Project Approval Process.
	EASR	MECP	*O. Reg 63/16: Registrations Under Part II.2 of the Act – Water Taking*	-	●	●	●	●	●	-	-	●	Required if temporary water takings are estimated to be greater than 50,000 Litres/ day (L/day), but less than 400,000 L/day.
	PTTW	MECP	*Ontario Water Resources Act* (O. Reg 128/03) Section 34	-	●	●	●	●	●	-	-	●	Required if temporary water takings are estimated to be greater than 400,000 L/day; the need for dewatering during construction activities will be confirmed during detailed design.
	ECA – Industrial Sewage	MECP	*Environmental Protection Act* *Ontario Water Resources Act* Section 53	-	-	-	-	-	-	-	-	●	A new ECA (or an amendment to an existing ECA) would be required for affected sewer pipes and pumping stations. The ECA application would be completed by Metrolinx and provided to the City and Municipality for their approval prior to it being submitted to the MECP.

Jurisdiction	Permit/Approval Name	Regulatory Authority	Legislation & Regulation	Project Components									Description of Project Activities that may Require Permits or Approvals
				Trackwork	B1 Thornton's Corners East GO Station	B2 Ritson GO Station	B3 Courtice GO Station	B4 Bowmanville GO Station	Bridges	At-Grade Crossing Widenings	Ancillary Structural Work	Utilities	
Provincial cont.	ECA – Air	MECP	*Environmental Protection Act*	●	●	●	●	●	●	●	●	●	Environmental Compliance Approval(s) are required for equipment held by contractors, owners and operators of that equipment, which will be obtained in advance of construction, as necessary.
	EASR – Air and Noise	MECP	*Environmental Protection Act*, O. Reg. 1/17	-	●	●	●	●	-	-	-	-	Approvals for the GO Station air and noise emission sources, with the exception of equipment or activities exempted by O. Reg. 524/98 Environmental Compliance Approvals – Exemptions from Section 9 of the Act, are required prior to their construction and operation. The application for approvals will be conducted when the designs are finalized and prior to installation/start of operations.
	Drinking Water Works Permit	MECP	*Safe Drinking Water Act, 2002,* O. Reg. 170/03	-	-	-	-	-	-	-	-	●	Required to alter a drinking water system.
	Waste removal	MECP	*Environmental Protection Act* O. Reg. 347	●	●	●	●	●	●	●	●	●	Required to transport and process hazardous and non-hazardous materials.
	On-Site and Excess Soil Management	MECP	*Environmental Protection Act* O. Reg. 406/19	●	●	●	●	●	●	●	●	●	Required for the handling, management and disposal of excavated material.
	ESA, 2007 Permit	MECP	ESA, 2007 *Section 17* O. Reg 242/08	●	●	●	●	●	●	●	●	●	In accordance with the ESA, 2007, permitting with the MECP will be required to address butternut[32], Bobolink and SAR Bats (i.e., Little Brown Myotis) identified within the Natural Environment Assessment Area. Butternut and Bobolink will be addressed under a Conditional Exemption as per O. Reg. 830/21. Little Brown Myotis may require an Overall Benefit Permit. Candidate habitat for additional SAR has been identified. In consultation

[32] Tree B-002 has been visually identified as a pure Butternut. Genetic testing is underway to confirm purity.

Jurisdiction	Permit/Approval Name	Regulatory Authority	Legislation & Regulation	Project Components									Description of Project Activities that may Require Permits or Approvals
				Trackwork	B1 Thornton's Corners East GO Station	B2 Ritson GO Station	B3 Courtice GO Station	B4 Bowmanville GO Station	Bridges	At-Grade Crossing Widenings	Ancillary Structural Work	Utilities	
													with the MECP, additional surveys may be required to verify the presence or absence of SAR and confirm permitting requirements under the ESA, 2007.
Provincial cont.	License to Collect Fish for Scientific Purposes	MNRF	*Fish and Wildlife Conservation Act, 1997*	-	-	-	-	-	●	-	-	-	Fish recovery and transfer will need to be conducted during isolation of flow to facilitate bridge construction.
	Wildlife Scientific Collector's Authorization	MNRF	*Fish and Wildlife Conservation Act, 1997*	-	-	-	-	-	●	-	-	-	Removal of wildlife, such as turtles, frogs or small mammals from the work site.
	Authorization or Tenure	MNRF	*Public Lands Act*	-	-	-	-	-	●	-	-	-	Land patents will be reviewed to determine if the Crown retains ownership of parcels adjacent to, or the riverbed of, Oshawa, Farewell and Harmony Creeks. The *Public Lands Act* would apply should there be Crown land requirements during construction and/or operations.
	Archaeological Assessment Review Letters	MCM	*Ontario Heritage Act*	●	●	●	●	●	●	●	●	●	Stage 2 AA (and Stage 3 and 4, if recommend by the Stage 2 AA) will be undertaken by a licensed archaeologist early in and prior to the completion of detailed design and submitted to MCM for review. Upon confirmation that the report has met fieldwork and licensing requirements MCM will issue a letter confirming their entry into the Ontario Public Register of Archaeological Reports. Metrolinx and/or Project Co will confirm that any AA reports submitted to MCM for review have been entered into the Ontario Public Register of Archaeological Reports prior to commencing any ground disturbing activities.
	Notice of Project	Ministry of Labour	*Occupational Health and Safety Act* *Regulation for Construction Projects - O. Reg. 213/91* *Section 6(1)*	●	●	●	●	●	●	●	●	●	Provide a Notice of Project to the Ministry of Labour prior to starting projects that meet the standards set out in the Regulation.

Jurisdiction	Permit/Approval Name	Regulatory Authority	Legislation & Regulation	Project Components									Description of Project Activities that may Require Permits or Approvals
				Trackwork	B1 Thornton's Corners East GO Station	B2 Ritson GO Station	B3 Courtice GO Station	B4 Bowmanville GO Station	Bridges	At-Grade Crossing Widenings	Ancillary Structural Work	Utilities	
Provincial cont.	Notification	-	*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 and the Registrar of Cemeteries at the Ministry of Government and Consumer Services. Should human remains be encountered during construction activities, all work on site must cease and notification will be required.
	Certificate of Closing	Ministry of Public Business and Service Delivery	*Funeral, Burial and Cremation Services Act, 2002*	-	-	-	-	-	-	●	-	-	Specific to road work on Prestonvale Road where impacts to St. Wolodymyr and St. Olha Cemetery are anticipated.
Conservation Authority	Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses	CLOCA	*Conservation Authorities Act* *O. Reg. 42/06*	●	-	-	-	-	●	-	-	-	Metrolinx as a Crown Agency of the Province of Ontario is not subject to the *CAA*. However, Metrolinx will engage with the CLOCA to incorporate their requirements as a best practice, where practical, and may obtain associated permits and approvals or engage in a Voluntary Project Review where applicable.
Municipal	City Trees Removal	City of Oshawa	City Trees By-Law 78-2008	●	●	●	-	-	●	●	●	●	Removal of trees on City property. Permits are not required for trees on Metrolinx-owned lands.
	Building Permit	City of Oshawa	-	-	●	●	-	-	-	-	-	-	A permit is required for construction of any building.
	Demolition Permit	City of Oshawa	-	-	-	●	-	-	-	-	-	-	A permit is required for the demolition of any building.
	Road Occupancy Permit	City of Oshawa	Road Occupancy By-law 37-2007	●	●	●	-	-	●	●	●	●	Work within the road right-of-way and/or closure of one or more lanes of traffic for construction (required prior to commencement of construction).
	Oversize Load Permit	City of Oshawa	Road Occupancy By-law 37-2007	-	-	-	-	-	●	-	-	-	Required for the transport of loads on municipal roadways that exceed dimensions or load limits as set out in the *Highway Traffic Act*.
	Temporary Entrance Permits	City of Oshawa	-	-	●	●	-	-	●	-	●	●	Temporary access to construction sites from roadways.

Jurisdiction	Permit/Approval Name	Regulatory Authority	Legislation & Regulation	Project Components									Description of Project Activities that may Require Permits or Approvals
				Trackwork	B1 Thornton's Corners East GO Station	B2 Ritson GO Station	B3 Courtice GO Station	B4 Bowmanville GO Station	Bridges	At-Grade Crossing Widenings	Ancillary Structural Work	Utilities	
Municipal cont.	Noise	City of Oshawa	Noise By-law 112-82	●	●	●	-	-	●	●	●	●	Limitations to daily and weekly timing of construction works will be implemented in accordance with local noise by-laws and where feasible. An exemption can be sought if required.
	Official Plan (OP) Amendment	City of Oshawa	-	-	●	-	-	-	-	-	-	-	Required where changes to the OP is required for new development or redevelopment proposals.
	Zoning Amendment	City of Oshawa	-	-	●	-	-	-	-	-	●	-	Required where changes to Zoning is required for new development of redevelopment proposals.
	Urban Design Guidelines	City of Oshawa	-	-	●	●	-	-	●	●	●	●	A series of design statements and images that demonstrate the City of Oshawa's desired design elements and qualities that shape development.
	Site Plan Approval	City of Oshawa	-	-	●	●	-	-	-	-	-	-	Project will undergo site plan review by the City of Oshawa. City of Oshawa will provide a Notice of Completed Review.
	Sewer Discharge	City of Oshawa	Storm Sewer By-law 46-2013	●	●	●	-	-	-	-	-	●	Required when private water is discharged into the City of Oshawa's sewer system, including groundwater, surface water, construction dewatering, rainwater (mixed with construction material), and stormwater (mixed with construction material).
	Building Permit	Municipality of Clarington	-	-	-	-	●	●	-	-	-	-	A permit is required for construction of any building.
	Noise By-Law	Municipality of Clarington	Noise By-law 2007-071	●	-	-	●	●	●	●	●	●	Limitations to daily and weekly timing of construction works will be implemented in accordance with local noise by-laws and where feasible. An exemption can be sought if required.
	OP Amendment	Municipality of Clarington	-	-	-	-	-	-	-	-	-	-	Required where changes to the OP is required for new development or redevelopment proposals.
	Zoning Amendment	Municipality of Clarington	-	-	-	-	●	●	-	-	-	-	Required where changes to Zoning is required for new development of redevelopment proposals.

Jurisdiction	Permit/Approval Name	Regulatory Authority	Legislation & Regulation	Project Components									Description of Project Activities that may Require Permits or Approvals
				Trackwork	B1 Thornton's Corners East GO Station	B2 Ritson GO Station	B3 Courtice GO Station	B4 Bowmanville GO Station	Bridges	At-Grade Crossing Widenings	Ancillary Structural Work	Utilities	
Municipal cont.	Urban Design Guidelines	Municipality of Clarington	-	-	-	-	●	●	-	-	-	-	A series of design statements and images that demonstrate the Municipality of Clarington desired design elements and qualities that shape development.
	Site Plan Approval	Municipality of Clarington	-	-	-	-	●	●	-	-	-	-	Alternative process to Site Plan Approval established between Metrolinx and Municipality of Clarington. Project will undergo site plan review by the Municipality of Clarington, followed by a complete final site plan review package upon approval from the Municipality of Clarington. Municipality of Clarington will provide a Notice of Completed Review.
	Road Occupancy Permit	Municipality of Clarington	Road Occupancy By-law 2014-022	●	-	-	-	●	●	●	●	●	Work within the road right-of-way and/or closure of one or more lanes of traffic for construction (required prior to commencement of construction).
	Oversize Load Permit	Municipality of Clarington	Road Occupancy By-law 2014-022	-	-	-	-	-	●	-	-	-	Required for the transport of loads on municipal roadways that exceed dimensions or load limits as set out in the *Highway Traffic Act*.
	Temporary Entrance Permits	Municipality of Clarington	-	-	-	-	●	●	●	-	●	●	Temporary access to construction sites from roadways.
	Oversize Load Permit	Regional Municipality of Durham	Road Occupancy and Weight Restriction By-law 026-2018	-	-	-	-	-	●	-	-	-	Required for the transport of loads on municipal roadways that exceed dimensions or load limits as set out in the *Highway Traffic Act*.
	Temporary Entrance Permits	Regional Municipality of Durham	Controlled Access Roads By-law 211-79	-	●	●	●	●	●	-	●	●	Temporary access to construction sites from roadways.
	Road Occupancy Permit	Regional Municipality of Durham	Road Occupancy and Weight Restriction By-law 026-2018	-	●	●	●	●	●	●	●	●	Work within the road right-of-way and/or closure of one or more lanes of traffic for construction (required prior to commencement of construction).

Jurisdiction	Permit/Approval Name	Regulatory Authority	Legislation & Regulation	Project Components									Description of Project Activities that may Require Permits or Approvals
				Trackwork	B1 Thornton's Corners East GO Station	B2 Ritson GO Station	B3 Courtice GO Station	B4 Bowmanville GO Station	Bridges	At-Grade Crossing Widenings	Ancillary Structural Work	Utilities	
Municipal cont.	Discharges to Sanitary and Storm Sewers on Regional Roads	Regional Municipality of Durham	Sewer Use By-law 055-2013	●	●	●	●	●	●	-	-	●	Required for water discharges into the sanitary and/or sewer system on Regional roads.
	Regional Servicing Agreement	Regional Municipality of Durham	Servicing Agreement By-law 36-2018	-	●	●	●	●	●	-	-	●	Required for any construction of any new or modified water, sanitary sewer, Regional storm sewer, or Regional road infrastructure.
Third Party Utilities	Utility Crossing Agreements	Various Existing Utility Owners	-	-	-	-	-	-	-	-	-	●	Project construction activities associated with relocating or realigning existing third-party utilities

Notes:
" – " = Not Applicable; " ● " = Applicable

8.4 Timing Windows and Preventive Measures

It is recognized that there are overlapping timing windows related to restrictions on certain construction activities, and Metrolinx will consult further with the applicable regulatory agencies to determine a suitable approach for construction scheduling. Relevant timing windows that may apply to the Project include those linked to migratory birds and fisheries.

Under the MBCA, the nesting period for most migratory birds for Nesting Zone C21 that encompasses the Project is from early April to late August, during which time vegetation removal is strongly discouraged to avoid contravention of the MBCA. As such, it is recommended that vegetation clearing does not occur between April 1 and August 31 of any given year. In accordance with the MBCA, if vegetation removal or other development activity must occur during the migratory nesting period of April 1 to August 31, a certified biologist or ornithologist must complete a nesting survey within 24 hours of commencement of work to document the presence or absence of active nesting habitats.

The Migratory Birds Regulations were updated and came into force on July 30, 2022. If birds listed on Schedule 1 of the updated regulations are found in the Project Footprint, nests of these species will have to be registered under the Abandoned Nest Registry if they are to be disturbed by Project activities.

In-water work should be avoided during the restricted activity period. The restricted activity periods for each watercourse are shown in the Table 8.2 below. In Ontario, the MNRF has the responsibility for setting timing window guidelines. These guidelines are determined on a case-by-case basis according to the species of fish in the water body, whether those fish spawn in the spring or fall. Recommendations for timing windows in CLOCA's Fisheries Management Plan (2013) have also been reviewed for local context. MNRF and CLOCA were consulted regarding restricted windows for in-water work and have confirmed the restricted window that applies at each crossing location (Table 8.2).

Table 8.2: Restricted Activity Period by Watercourse

Aquatic Survey Station	Restricted Window for In-Water Work
Goodman Creek (WC-1)	March 15 to July 15
Oshawa Creek (WC-2)	September 15 to July 15
Harmony Creek (WC-3)	September 15 to July 15
Farewell Creek (WC-4)	September 15 to July 15
Unnamed Tributary of Lake Ontario in proximity to the rail corridor and west of Prestonvale Road (WC-5)	March 15 to July 15

Aquatic Survey Station	Restricted Window for In-Water Work
Robinson Creek (WC-6)	September 15 to July 15
Unnamed Tributary and Tooley Creek tributary in proximity to the rail corridor and west of Courtice Road and north of Baseline Road West (WC-7 and WC-9)	March 15 to July 15
Tooley Creek (WC-8)	September 15 to July 15
Darlington Creek (WC-11)	September 15 to July 15
Darlington Creek tributaries in proximity to the rail corridor and south of Baseline Road West; east of Holt Road; and east of Maple Grove Road (WC-10, WC-12, WC-13 and WC-14)	March 15 to July 15

8.5 Commitments and Future Work

The commitments outlined in this EPR Addendum are developed to a conceptual level of detail to satisfy the requirements of *O. Reg. 231/08*. The purpose of the commitments is to facilitate the implementation of the Project in accordance with the mitigation measures and monitoring activities described in this EPR Addendum and in a manner that does not result in negative effects on matters of provincial interest related to the natural environment, cultural heritage value or interest, or constitutionally protected aboriginal or Treaty rights.

Where the content in this EPR Addendum varies from the mitigation measures and future commitments prescribed in the 2011 EPR, they are considered to be applied in addition to those identified in the 2011 EPR and should be carried forward as applicable. However, mitigation measures and future commitments prescribed in the 2011 EPR specific to B1 Thornton's Corners East GO Station, the CP Rail connection through Corbett Creek, East Rail Maintenance Facility, Bloor Street GO Station and new train layover site are no longer applicable, as those Project components are no longer consistent with this EPR Addendum.

Metrolinx is committed to implementing the mitigation and monitoring activities outlined in Section 5.10. Commitments for future work for subsequent phases of the Project linked to the implementation of the identified mitigation and monitoring activities are outlined in Table 8.3.

Table 8.3: Summary of Commitments

Discipline	Commitments
Detailed Design	
General	• Implement mitigation measures and monitoring activities as outlined in Section 5.10. • Develop/undertake design and management plans in accordance with the specific mitigation measures identified through the effects assessment and listed in Section 5.10. • A range of municipal permits and approvals may be required for the Project, particularly pertaining to municipally owned lands and infrastructure. All required permits and approvals shall be obtained. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals. • Communication and engagement with the relevant agencies shall continue as design and construction planning progress to address agency interests. • Final detailed monitoring plans will be developed as part of detailed design activities. • Metrolinx is committed to working with Indigenous communities to develop environmental and construction monitoring plans to ensure regulatory compliance. Metrolinx will continue to work with Indigenous communities to come to a mutually agreeable approach to on-site compliance monitoring and join construction monitoring.
Construction	
General	• Implement mitigation measures and monitoring activities related to construction as outlined in Section 5.10. • Develop/undertake design and management plans in accordance with the specific mitigation measures identified through the effects assessment and listed in Section 5.10. • An Environmental Mitigation and Monitoring Plan (EMMP) will be developed prior to construction to outline the responsibilities for carrying out monitoring activities (see Section 8.5.2).
Natural Environment	• An Erosion and Sediment Control Plan, in accordance with the Greater Golden Horseshoe's Erosion and Sediment Control Guideline for Urban Construction (2019), as amended from time to time, will be prepared prior to and implemented during construction to reduce the risk of sedimentation to the waterbody. • A Spill Prevention and Response Plan will be developed before work commences. • Metrolinx will provide Indigenous communities with updates, as they become available, regarding bat monitoring, mitigation and compensation at regularly planned meetings.

Discipline	Commitments
Natural Environment cont.	• The contractor will develop an Amphibian and Reptile Management Plan for construction activity in relevant areas, which will be circulated to Indigenous communities for comment. • Wildlife exclusionary fencing designs will be circulated to Indigenous communities for comment. • Vegetation restoration and planting plans will be shared with Indigenous communities for feedback. • Indigenous communities will be invited to provide input to discussions regarding potential habitat connectivity opportunities, as part of vegetation restoration planning. • The contractor will develop an Invasive Species Management Plan, which will be circulated to Indigenous communities for comment. • The contractor will be in adherence with DFO's Code of Practice: Beaver Dam Breaching and Removal. • A Permit to Take Water or Environmental Activity and Sector Registry (EASR) may be required prior to dewatering. • The dewatering monitoring plan, if required, will monitor for potential negative impacts on nearby wetlands and adjacent vegetation communities to confirm if they would be affected due to dewatering activities. An adaptive management plan will be prepared if negative impacts are observed. • Prior to dewatering isolated work areas, fish will be captured and relocated to suitable habitat outside of the work area under a Licence to Collect Fish for Scientific Purposes from the MNRF. • Fish passage analysis (e.g., 2-year storm event/bankfull) of all structures in the study area will be conducted to determine existing conditions to help guide detailed design of new structures (including extensions). • Wildlife will be captured and relocated to suitable habitat outside of the work area under a Wildlife Scientific Collector's Authorization from the MNRF. • An Arborist Report will be prepared by an ISA Certified Arborist with regard to Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction), *Ontario Forestry Act* R.S.O. 1990, the ESA, 2007, and other regulations, municipal by-laws and best management practices as applicable. • Provide compensation for the removal of vegetation in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Provide compensation for disturbed or removed wetlands based on Metrolinx guidelines and in consultation with CLOCA. • An IVM Plan will be developed and implemented that is in adherence with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction) and the IVM Program. • The presence, density, and location of compatible and incompatible species will be monitored as per the frequency and methodology established in the Bi-Annual Monitoring Program within Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction).

Discipline	Commitments
Natural Environment cont.	• Three active Barn Swallow nests were observed in one of the culverts associated with Darlington Creek in the Project Footprint, just east of Rundle Road. Nests must be protected (works will not occur that may damage or destroy the nest) between May 1 and August 31 (residency occupancy period). • Identify opportunities to promote pollinator species and habitat in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). • Opportunities to plant milkweed or forage vegetation outside and within the rail ROW will be undertaken, where possible, and in accordance with Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction). In consultation with the MECP, additional surveys may be required to verify the presence or absence of SAR and confirm permitting requirements under the ESA, 2007. • If any works are proposed within the critical root zone (i.e., 25 m radius from stem) of the tree visually identified as a butternut (i.e., B-002), mitigation, monitoring and compensation to address impacts to the butternut may be required based on the results of additional surveys (i.e., Butternut Health Assessment) and consultation with the MECP. Genetic testing is underway to confirm purity. • Data from motion sensor wildlife movement cameras at Tooley Creek will be analyzed following the survey period ending in May 2024 and will be reported under separate cover at that time. • Juvenile Rainbow Trout were captured at Tooley Creek in the spring and summer of 2023, where they had previously not been documented since 2015. Since there is the potential for Tooley Creek to contain salmonid spawning, spawning surveys are recommended for Tooley Creek along with some of the other nearby creeks in the fall season. Spawning surveys are recommended at the following creeks: – Harmony Creek (WC-3) – Farewell Creek (WC-4) – Robinson Creek (WC-6) – Tooley Creek (WC-8) – Darlington Creek (WC-10)
Tree Inventory	• Where trees on private property will be impacted by the Project and have not been inventoried, prior to the start of construction activities, an additional Arborist Report, or an addendum to the existing Arborist Report, will be prepared which meets regulatory requirements and is completed by an I.S.A. Certified Arborist. The report will be completed with regard to Metrolinx's Vegetation Guideline (Metrolinx 2022, and subsequent updates prior to construction). • A Tree Removal Strategy/Preservation Plan, building upon the considerations and elements set out in Metrolinx's Vegetation Guideline (2022, and subsequent updates prior to construction), will be developed during detailed design to document tree protection and mitigation measures that follow municipal by-laws and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections.

Discipline	Commitments
Geology and Groundwater	• Develop a Soil and Excavated Materials Management Plan (SEMMP) during Detailed Design for the handling, management and disposal of all excavated material (i.e., soil, rock and waste) that is generated or encountered during the Works. The SEMMP will be reviewed and approved by Metrolinx prior to construction.
Bedrock Geology	• Develop a Groundwater Management and Dewatering Plan (GMDP) during Detailed Design to guide the handling, management, and disposal of groundwater encountered during the Works. The GMDP will be overseen by a QP and will comply with O. Reg. 406/19 (On-Site and Excess Soil Management), 64/16 and 387/04, as amended under the *Ontario Water Resources Act*. • A Groundwater Management Monthly Dashboard Report will be developed by the Constructor for Metrolinx review to document performance monitoring data/results and any corrective actions implemented during the previous month. • Upon completion of the work, the Constructor will submit a Groundwater Management and Dewatering Implementation Report to Metrolinx. • A Spill Prevention and Response Plan will be developed and adhered to. Spills will be immediately contained and cleaned up in accordance with provincial regulatory requirements and the response plan.
Stormwater Management	• Prepare and implement a Drainage and SWM Report, an Erosion and Sediment Control Plan, detailed drainage design and ESC drawings in accordance with the MECP Stormwater Management Planning and Design Manual (2003), the Toronto and Region Conservation Area's Erosion and Sediment Control Guideline for Urban Construction (2019), as amended from time to time, the MECP Low Impact Development Stormwater Management Guidance Manual (draft) (2022) and the guidelines and regulatory requirements of the Conservation Authority having jurisdiction. • A detailed assessment of proposed ditches along the rail corridor is required to provide adequate drainage conveyance in accordance with municipal requirements, Metrolinx Standards and American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering (latest revision). • Develop and implement a Spill Prevention and Response Plan in accordance with the Project Agreement. • A hydraulic assessment of each crossing and any proposed bridges is required to determine proposed flood levels and associated creek bed and bank treatments to prevent scour and erosion and facilitate fish passage. Where applicable, the regulatory model(s) will be obtained from the local Conservation Authority to assess the hydraulic impacts along regulated watercourses. • Prior to construction, develop a Flood Contingency Plan with specific mitigation measures for any proposed works or temporary laydown and staging areas, as required. The Flood Contingency Plan may include risk mapping, and a monitoring strategy.

Discipline	Commitments
Air Quality	• If the types and quantities of construction equipment evaluated in the AQ Technical Report (Appendix A3) differ substantially from the types and quantities anticipated to be used by the Contractor, the Contractor will be responsible for ensuring equipment meets the emission limits referenced in the report. • Adherence to the site-specific mitigation and monitoring recommendations identified in the Air Quality Technical Report (Appendix A3). • Prior to commencement of construction, develop and submit a detailed Construction Air Quality Management Plan (AQMP). • Establish a communication protocol with nearby sensitive/critical receptors to provide alerts when monitoring indicates that air contaminant concentrations may be elevated for a prolonged period of time (e.g., over 8 hours), and also provide guidance on methods to limit exposure (e.g., remaining indoors with windows closed during periods of adverse AQ, confirm Heating, Ventilation, and Air-Conditioning System (HVAC) systems are maintained following manufacturer's recommendations, etc.)
Noise and Vibration	• If the types and quantities of construction equipment evaluated in the Noise and Vibration Technical Report (Appendix A4) differ substantially from the types and quantities anticipated to be used by the Contractor, the Contractor will be responsible for ensuring equipment meets the sound level limits referenced in the report. • Prior to start of construction, noise emissions of the construction equipment considered for the Project should be reviewed to confirm that they are within the NPC-115 and NPC-118 limits. If the limits cannot be met, noise control options should be investigated and implemented to bring them into compliance. • It is assumed that the western portion of the Courtice Road (B3 Courtice) GO Station location will be used for parking only. Should other types of development be placed on this portion of the site, additional noise / vibration assessment may be required to assess the potential for effects to adjacent receptors. • Additional noise and vibration monitoring will be conducted during the detailed design phase of the Project. These measurements should be collected to confirm that modelled ambient noise levels are a conservative estimate of existing ambient sound levels and that measured vibration levels are also representative of the existing conditions along the Project corridor. • Prior to commencement of construction, develop and submit a detailed Construction Noise and Vibration Management Plan based on the actual equipment sound levels and their locations.

Discipline	Commitments
Socio-Economic and Land Use	• Develop a Communications Protocol in accordance with the Project Agreement, which will indicate how and when surrounding property owners and tenants will be informed of anticipated upcoming construction works, including work at night, if any. • Develop a Complaints Protocol in accordance with the Project Agreement. • Develop a plan to reduce the effects of light pollution in accordance with the Project Agreement. • Implement Crime Prevention Through Environmental Design principals to address these concerns during detailed design. • Develop and implement a detailed Utility Infrastructure Location Plan that identifies all utilities anticipated to be impacted by the construction works, all relevant utility agencies and authorities, and outlines the approach to the utility relocation process. The Utility Infrastructure Location Plan will be developed in accordance with the Project Agreement.
Cultural Environment	• Archaeological concerns have not been addressed until a report(s) has been entered into the Ontario Public Register of Archaeological Reports where those reports recommend that: – the archaeological assessment of the Project Footprint is complete and; – all archaeological sites identified by the assessment are either of no further cultural heritage value or interest (as per Section 48(3) of the *Ontario Heritage Act*) or that mitigation of impacts has been accomplished through excavation or an avoidance and protection strategy • All AA findings will be shared with Indigenous communities, as per Metrolinx procedures. • The Constructor will develop and implement an Archaeological Risk Management Plan that addresses any recommendations resulting from Archaeological Assessments and documents all protocols for the discovery of human remains and undocumented archaeological resources. • A Cemetery Investigation Authorization issued by the Bereavement Authority of Ontario is required in advance of invasive archaeological fieldwork within the cemetery property. • HIAs are being undertaken for Albert Street Bridge (Built Heritage Resource (BHR-52)), Farewell Street Multi-Use Bridge (BHR-156), 356 Ritson Road South (BHR-147), St. Wolodymyr and St. Olha Cemetery (BHR-157), and 2228 Baseline Road (BHR-167).

Discipline	Commitments
Cultural Environment cont.	• The following reports will be completed for 500 Howard Street (BHR-115): – Phase I - HIA for the stabilization, protection and mothballing of Part 1 (all heritage attributes are encompassed in Part 1); the identification of all programming needs; the potential full or partial demolition of Part 2; and the potential (partial or complete) transfer of Part 2 out of provincial control. o The HIA for the demolition of Part 2 of the building on the property was completed on April 13, 2023. The demolition of Part 2 received MCM Minister's Consent on May 26th, 2023. o If construction of the Front Street (B2 Ritson) GO Station is to occur during this phase (Phase I), an additional HIA will be prepared, to describe all impacts and mitigations. – Phase II – HIA will be completed for the rehabilitation, interpretation and adaptive reuse of Part 1 of the property. If the construction of the new Front Street (B2 Ritson) GO Station was not assessed previously in Phase I, it will be included in this HIA. It will also include the development of the TOC and adaptive reuse of Part 1. To protect the heritage value of Part 1, legally binding protections are required and will be secured through applicable agreements via the TOC program, or as part of a future disposition. A future disposition would be subject to an additional Minister's Consent prior to any demolition, removal, or transfer of any part of the property out of provincial control. • The HIA is undertaken by a qualified person, and work closely with MCM to confirm all cultural heritage requirements are met. Additionally, MCM Minister's Consent is required before removing or demolishing buildings or structures on the property, or before transferring the property from provincial control. The HIA will provide the documentation and rationale for application for the Minister's Consent, should removal or demolition be required. The Minister may grant Consent, with or without conditions, where the Minister is of the opinion that all alternatives to the removal, demolition or the transfer of the property have been considered, including alternatives that would not adversely affect the property, and the best alternative in all the circumstances has been adopted. The Minister, as a condition of Consent, may require that such reasonable steps as the Minister may specify be taken to minimize or mitigate adverse effects on the property resulting from the removal, demolition or the transfer of the property.

Discipline	Commitments
Transportation	• Durham Region Transit will be consulted in advance of construction to confirm detour routing. • Prior to construction activities on roads impacted by structural work, Traffic Control and Management Plan(s) will be developed, as applicable, to maintain reasonable access through work zones for all travel modes, to the extent possible. • Construction staging scenarios assessed are considered conceptual and subject to refinement as planning progresses and further consultation is undertaken with applicable municipalities and agencies. If required, additional traffic assessment(s) will be undertaken in accordance with applicable guidelines. • Notify the public in advance of any potential service disruptions.
Operations	
General	• Implement mitigation measures and monitoring activities related to operations as outlined in Section 5.10. • Develop/undertake design and management plans in accordance with the specific mitigation measures identified through the effects assessment and listed in Section 5.10.
Natural Environment	• An Erosion and Sediment Control Plan, in accordance with the Greater Golden Horseshoe's Erosion and Sediment Control Guideline for Urban Construction (2019) will be prepared prior to and implemented during maintenance activities to reduce the risk of sedimentation to the waterbody. • A Spill Prevention and Response Plan will be developed before work commences.
Air Quality	• For the purposes of the air quality assessment, it was assumed that GO station development at Fox Street (B1 Thornton's Corners East) may be situated at the southern point of the proposed location (shown on Figure 2.1). Siting of the proposed GO station is subject to delivery by Metrolinx's TOC Program. Refinements to the air quality assessment may be required to assess the potential for effects to adjacent receptors following confirmation of GO station location. • Air approvals should be obtained for the GO station operations and air emission sources as applicable. • A detailed Operations Air Quality Management Plan should be developed to document the controls and methods that Metrolinx will implement during project operations to limit the generation and dispersion of airborne particulate matter and air contaminants associated with the project operations.

Discipline	Commitments
Noise and Vibration	• Five additional Point of Receptions (POR) were considered for assessing stationary noise impact from GO stations associated with the TOCs. GO stations are expected to be developed in conjunction with mixed uses such as commercial and residential. At the time of preparing this report, no information was available for TOCs. Therefore, they are not considered as receptors for this assessment. It is recommended that further detailed studies be conducted once the design of the GO stations and TOCs has advanced. • For the purposes of the noise and vibration assessment, it was assumed that GO station development at Fox Street (B1 Thornton's Corners East) may be situated at the southern point of the proposed location (shown on Figure 2.1). Siting of the proposed GO station is subject to delivery by Metrolinx's TOC Program. Refinements to the noise and vibration assessment may be required to assess the potential for effects to adjacent receptors following confirmation of GO station location. • Additional validation measurements will be collected after the commissioning of the Project to validate modelled sound levels.
Transportation	• Multi-modal planning and analysis for each proposed station site will be provided at later stages of the Project where further details of the proposed GO stations and their adjacent TOC plans become available in accordance with the municipal planning process and subject to delivery through Metrolinx's TOC Program.

8.5.1 Summary of Mitigation and Monitoring Requirements

This section is to be read in conjunction with Section 5.10 of the EPR Addendum. Upon completion of the TPAP, Metrolinx will finalize detailed design of the proposed improvements to the Project, while seeking necessary permits and approvals. Consultation will continue through detailed design and construction where required for obtaining permits, informing interested parties of construction updates, and coordinating with municipalities and Indigenous communities (where required).

To avoid and/or mitigate the potential adverse environmental effects associated with the Project to the extent possible, the following actions will be adhered to by Metrolinx during detailed design and construction phases of the Project:

- implement all mitigation measures as documented in Section 5.10 of this EPR Addendum during the detailed design, construction and operational phases of the Project
- capture the mitigation measures outlined in Section 5.10 of this EPR Addendum and commitments outlined in Table 8.3 of this EPR Addendum in the Contract Documents for implementation by Metrolinx, and/or the Contractor as appropriate

- capture mitigation measures outlined in the 2011 EPR in the Contract Documents for implementation by Metrolinx, and/or the Contractor as appropriate, where not superseded by those detailed within the EPR Addendum
- undertake all additional studies/work as outlined in this EPR Addendum prior to implementation of the undertaking

The key objectives of monitoring activities are as follows:

- confirm accuracy of predictions in the EPR Addendum
- facilitate compliance with regulatory standards, approval requirements, etc.
- track the status and resolution of EA commitments and requirements
- augment EA information if needed
- evaluate the effectiveness of mitigation measures
- identify where effects/conditions do not meet regulatory requirements so that contingency measures can be taken

In advance of commencing construction activities, mitigation measures will be implemented as outlined in Section 5.10 and monitoring activities (also outlined in Section 5.10) will continue throughout construction activities, and upon completion of construction, where required. Final, detailed monitoring plans will be developed as part of detailed design activities.

8.5.2 Environmental Mitigation and Monitoring Plan

Metrolinx prepares an EMMP for its projects, to guide contractors and site personnel in the effective implementation of environmental controls during construction. The EMMP will outline environmental protection measures for natural environment and socio-economic features located on or adjacent to the Project site. The EMMP will include both general and site-specific environmental protection measures based on Project-specific requirements, past project experience, current industry best management practices, and consistency with federal and provincial construction mitigation practices. The EMMP will:

- outline environmental protection measures related to Project activities
- provide instructions for carrying out construction activities to limit environmental effects

- serve as reference information for the environmental inspection staff to support decision making and provide links to more detailed information

The EMMP will be based on the fieldwork conducted in support of the EPR Addendum to provide Project-related environmental mitigation measures and follow-up commitments to be addressed during the detailed engineering design, construction and post-construction reclamation phases.

The EMMP will be developed with the goal of ensuring that construction is completed in compliance with environmental approvals, commitments and obligations. A core component of the EMMP will be engaging an Environmental Monitor, which will provide the following services in implementing the EMMP:

- conduct a routine monitoring program to confirm that environmental protection measures are conducted as planned
- identify and provide direction to remediate any unexpected environmental occurrences (i.e., failure of environmental protection measures, damage to protection measures resulting from unexpected storms)
- provide expert guidance to Project staff during construction to check that the environment is protected according to environmental approvals, commitments and obligations
- confirm that any commitments or requirements developed in accordance with regulatory authorities are carried out as planned, and recommend additional protection measures, if required
- document environmental protection measures, deficiencies and methods to address environmental deficiencies carried out by Project staff
- where required, act as a liaison between Metrolinx and regulatory agencies when issues arise during construction
- conduct additional field programs as required (i.e., fish rescue programs)
- identify appropriate timing windows (e.g., in-water works, breeding bird season) and clear sites for construction where required

The EMMP will outline how environmental monitoring staff will address deficiencies with the Contract Administrator and construction contractor so that these issues can be resolved in a timely manner to avoid negative effects to the environment.

The EMMP will also outline procedures for construction monitoring staff to provide direction to the construction contractor for location of environmental protection measures that require site specific considerations. They will also identify areas that may require additional environmental protection measures not identified on the construction drawings. Any additional environmental mitigation measures will be discussed with Metrolinx staff prior to directing the contractor to install them.

8.6 Mechanisms for Changes to the Approved Plan

8.6.1 Design Refinements

The Project presented in this EPR Addendum document is not a static plan, nor is the context in which it is being assessed, reviewed, approved, constructed, and used. Given the potential for changes to the Project resulting from the approvals, detailed design, and construction processes, it is the responsibilities of the proponent, should changes be required in the Project.

8.6.2 TPAP EPR Addendum Process

This EPR Addendum identified the effects associated with the Project presented in this document, and the Project Footprint within which the Project can feasibly be constructed. The layout of Project components is subject to detailed-design and any variations from that shown in this EPR Addendum, unless it results in an environmental effect which cannot be accommodated within the committed mitigation measures, may not require additional consideration under O. Reg. 231/08.

Metrolinx is committed to further consultation with Indigenous communities, the public and regulatory agencies during the design of the Project. Metrolinx will continue to mitigate disruptions to affected local communities and maximize public support for the Project.

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