Bus Rapid Transit

Environmental Studies

The Durham-Scarborough Bus Rapid Transit project has begun the Transit Project Assessment Process, a streamlined Environmental Assessment process under Ontario Regulation 231/08. To support the project, environmental studies are being completed to document existing conditions and assess any potential impacts from the Bus Rapid Transit project.

Field investigations were undertaken in 2019, 2020, and 2021 to collect data on existing conditions.

The studies will determine potential impacts and document mitigation measures that could be applied to reduce or eliminate potential impacts. Mitigation measures proposed will be used by the design team to review and improve the design.

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These studies will form part of the Environmental Project Report which will be posted for public review.





The following draft studies are being completed:

Natural Environment Studies

Natural Heritage Assessment • Tree Inventory Noise and Vibration Assessment Air Quality Assessment Climate Change Assessment Drainage and Stormwater Management

Social Environment Studies

Stage 1 Archaeological Assessment Cultural Heritage Resource Assessment • Socio-economic and Land Use Study



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Matters of Provincial Importance

Matters of Provincial Importance must be considered during the Transit Project **Assessment Process, following Ontario Regulation 231/08.**



Indigenous Relations

Constitutionally protected Aboriginal or treaty rights and areas of concern





Natural Heritage

- Park, conservation reserve or protected area
- Extirpated, endangered, threatened, or species of special concern and their habitat
- Wetland, woodland, habitat of wildlife or other natural heritage area
- Area of natural or scientific interest
- Stream, creek, river, or lake containing fish and their habitats







Hydrology

- Area or region of surface water or groundwater or other important hydrological feature
- Areas that may be impacted by a known or suspected on or off-site source of contamination

Heritage & Archaeology

- Protected heritage properties
- Built heritage resources
- Cultural heritage landscapes
- Archaeological resources and areas of potential archaeological interest





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Natural Heritage & Tree Inventory

Detailed field investigations were undertaken between April 2019 and June 2020 to examine natural heritage features and tree resources.

The following are present within the study area:



305 plant species, 57% native and 43% non-native



7 herpetofauna, 1 invertebrate, 9 mammal species and 69 bird species



17 species at risk (3 aquatic, 2 plant, and12 wildlife):3 were identified during field investigations: BarnSwallow, Butternut and Kentucky coffee tree



3 Provincially Significant Wetlands, 14 Environmentally Sensitive Areas, and 3 Areas of Natural and Scientific Interest



23 watercourses within 10 watersheds





Potential construction impacts include:

- Removal / disturbance of roadside trees, vegetation/vegetation communities and significant natural heritage features
- Removal / disturbance of wildlife/wildlife habitat
- Disturbance to species at risk/species at risk habitat
- Disturbance to fish/fish habitat
- Increase in erosion and sedimentation

To mitigate construction impacts, the following measures are proposed:

- Designate tree protection zones (TPZ) around trees adjacent to construction works
- Adhere to timing restrictions for construction, tree removal, and in-water works
- Implement erosion and sediment control measures
- Meet requirements under the Canada Species at Risk Act and Ontario Endangered Species Act





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Natural Heritage Potential operational impacts include:

- Effects on aquatic environment (e.g., culvert/bridge extensions/widenings, channel/ditch realignment, riparian vegetation clearing, modifications to drainage due to increase in impermeable surfaces, the addition of stormwater management features)
- Potential increases in water temperatures resulting from increased impervious areas
- Removal / disturbance of wildlife/wildlife habitat (e.g., barriers to wildlife movement, vehicle conflicts, displacement
 of significant wildlife habitat)
- Potential to result in disturbance to/displacement of rare, threatened or endangered aquatic, plant and wildlife SAR and SAR habitat, plant species of concern/regionally rare plant species





Ellesmere Road Bridge Dundas Street Bridge



To mitigate operational impacts, the following measures are proposed:

- Minimize the design to keep bridge widenings and culvert extensions as short as possible, include retaining walls to reduce encroachment into riparian areas
- Opportunities to improve fish passage via culvert works to be explored during detail design
- All major corridors associated with valleylands will be maintained to facilitate wildlife passage.
- Structure/culvert modifications to be designed to maintain and promote wildlife passage across the landscape.
- Further consultation with external agencies (e.g., Ministry of the Environment, Conservation and Parks, Fisheries and Oceans Canada Environment and Climate Change Canada and Parks Canada) during the detail design phase, as required, to discuss identified SAR (and SAR habitat) and mitigation measures
- Further targeted field investigations to be undertaken for SAR.
 Surveying for these species will establish their presence or absence, and, thus, the appropriate steps for protection and permitting
- Meet requirements under the Canada Species at Risk Act and Ontario Endangered Species Act





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Tree Inventory

Detailed field investigations were undertaken in winter and spring of 2020 to complete the tree inventory.

The following are present within the study area:

7,926 trees consisting of 86 species

Two Species at Risk were identified during field investigations: Butternut and Kentucky coffee tree

The streetscape Kentucky coffee trees do not require Ontario Endangered Species Act authorizations as they are cultivors



Ellesmere Road in the City of Toronto





- Removal / disturbance of roadside trees
- Removal / disturbance of wildlife/wildlife habitat
- Disturbance to species at risk/species at risk habitat To mitigate construction impacts, the following
- Designate tree protection zones (TPZ) around trees adjacent to construction works.
- Adhere to timing restrictions for construction, April 1 -August 31 for migratory birds (e.g., *Migratory Bords Convention Act*) or have a qualified Avian Biologist complete a survey within in 24-hours if removals must occur during this timing window
- Consider transplanting trees identified for removal during detail design
- During detail design, undertake a detailed butternut survey and implement appropriate steps for protection under the Ontario Endangered Species Act
- Undertake steps to preserve heritage trees on properties listed on the Heritage Registers and are part of the cultural heritage landscape

Potential construction impacts include:

measures are proposed:





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Cultural Heritage

Cultural heritage specialists reviewed the corridor to identify known and potential cultural heritage (CH) properties. A known CH resource is a property that has been evaluated against Ontario Regulation <u>9/06</u> and <u>10/06</u>. A potential CH resource is a property that has potential but is yet to be evaluated.

A total of 230 built heritage resources and cultural heritage landscapes were identified in the study area. Assessment of impacts is underway.





City of Toronto 15 Total

- 2 Known CH Properties
- 1 Commemorative Feature:
 - Park at Ellesmere Rd & Military Trail
- **1** National Urban Park:
 - Rouge National Urban Park
- **11** Potential CH Properties

City of Pickering 17 Total

- **1** Known CH Property
- 16 Potential CH Properties

Town of Ajax 59 Total

- **1** Heritage District:
 - Pickering Village
- **12** Known CH Properties
- **46** Potential CH Properties

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The Rouge National Urban Park is Canada's first national urban park.

Some of Downtown Oshawa's mixed-use buildings are potential built heritage resources.

Town of Whitby 62 Total

- **1** Heritage District:
 - Werden's Plan Neighbourhood
- **2** Known CH Properties
- 59 Potential CH Properties

City of Oshawa 77 Total

- **1** Known CH Property
- 76 Potential CH Properties









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Cultural Heritage

The preliminary preferred design strives to stay within the road allowance to minimize impacts to cultural heritage resources.

In some areas, where avoidance is not possible, the design may result in direct impacts to known/potential cultural heritage resources.

Construction activities may result in indirect impacts.



This built heritage resource is a known CH property, designated under the Ontario Heritage Act.

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To mitigate impacts, the following measures are proposed:

Cultural Heritage Evaluation Report(s) will be completed to determine if directly impacted resources have cultural heritage value or interest.

If a directly impacted property has cultural heritage value or interest, a Heritage Impact Assessment will be completed to identify appropriate mitigation measures.

Local Heritage Advisory Committees, Indigenous Nations, and the Ministry of Heritage, Sport, Tourism and Culture Industries will be consulted during any cultural heritage studies.

Indirect impacts include temporary adverse vibration from construction activities. A condition assessment of the structures within the vibration zone of influence is recommended.





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Ellesmere Rd and Markham

This area has no archaeological potential.

Dundas St near Garden St

The area beyond the bridge footing and rightof-way requires a Stage 2 survey.

Parts of the study area have archaeological potential and will require a Stage 2 assessment prior to disturbance / construction. This excludes areas with slopes in excess of 20 degrees, low and wet conditions, and deep and extensive land disturbance.

Interested Indigenous Nations may be engaged during further assessments.

Cemeteries

5 cemeteries were identified within the study area. 3 require a Cemetery Investigation:

- Church Cemetery

A Stage 3 Cemetery Investigation is required for lands impacted by the project within 10 m of cemetery properties to confirm the presence or absence of unmarked graves.

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• Ajax - St. George's Anglican Whitby - Mount Lawn Cemetery • Oshawa - Union Cemetery

Previously Registered Archaeological Sites

3 previously registered archaeological sites are located within the study area.

None of the registered archaeological sites exhibit cultural heritage value or interest or require further assessment.

If unexpected archaeological materials are encountered, all work will stop. The site will be protected until assessed by a licensed archaeologist.





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Air Quality

Data from air quality monitoring stations was examined to determine existing conditions and the locations of sensitive receptors.

Air emissions that were assessed include: CO, NO₂, SO₂, volatile organic compounds (VOCs), $PM_{2.5}$, PAH, and greenhouse gases (GHGs).

Examples of sensitive receptors include:

- Place of residence
- Child care facility
- Health care facility
- Senior citizens residence
- Long-term care
- School

Potential construction impacts include:

• Air pollution and dust from construction activities





To mitigate construction impacts, the following measures are proposed:

- Cover sources of dust where possible
- Apply dust suppressants
- Use low emissions equipment where possible
- Limit dust generating activities during high-wind conditions

Potential operational impacts include:

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To mitigate operational impacts, the following measures are proposed:

- Fuel and technology are available to reduce tailpipe emissions of the proposed BRT buses
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Air pollution from operational activities

- Upgrading transit buses from conventional internal combustion engine technology to hybrid or electric technology
- Blending of biological-based fuels





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Noise & Vibration

A background review has been completed. About 40 potential sensitive receptors were studied to help understand the ambient noise within the study area.

Modelling was completed to analyze future conditions. Future 'with BRT' and 'without BRT' scenarios were modelled. The primary source of noise is traffic along Ellesmere Road and Highway 2.

Potential construction impacts include:

Noise and vibration from construction activities

To mitigate construction impacts, the following measures are proposed:

- Use low vibration construction equipment ۲ where possible
- Use construction equipment that is compliant with the • Ministry of the Environment, Conservation, and Parks' noise level specifications
- Implement restrictions on construction hours in • accordance with local by-laws





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To mitigate operational impacts, the following measures are proposed:

Potential operational impacts include:

Sound level predictions projected to be above the absolute sound level at some sensitive receiver locations (MTO threshold is 65 dBA and Durham Region is 60 dBA)

Incremental impacts are below the MTO and Durham Region threshold of +5 dBA at all locations in the study area

Noise barriers at sensitive receiver locations in compliance with MTO, Toronto and Durham Region noise guidelines





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Socio-Economic & Land Use Conditions

An existing conditions review was completed to understand the population that exists in the study area. Census data was reviewed to determine factors such as population and business density, age structure, household income, immigration and education attainment.

The review found that there are areas with a high density of businesses along the corridor. BRT will support expected growth by connecting people and jobs along the corridor.

The North American Industry Classification System structure was used to categorize businesses into the following classifications:

- Primary
- Employment Lands
- Retail and Service
- Office
- Institutional

Some businesses classifications are more sensitive to disruptions such as construction and loss of parking than others. Traffic mitigation measures are described on the next slide.





Community Liaison Committees

- Metrolinx will establish Community Liaison Committees (CLCs) that will meet regularly during detailed design and construction.
- CLCs will include stakeholders such as local residents, community associations, business associations, and other important organizations along the corridor.
- CLCs will provide Metrolinx and the constructor with feedback on matters such as traffic calming measures, business supports, and mitigation strategies for construction and noise disruption.

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Traffic Mitigation Measures

A draft traffic impact analysis has been completed. Metrolinx will actively communicate construction timelines as the project advances through detailed design.

Potential operational impacts include:

- Changing truck routes
- New bus routes and stops
- Accessibility support

To mitigate operational impacts, the following measures are proposed:

- Upgrade traffic signal technology and improved signal timing to reduce congestion
- Dedicated bus lanes will result in smoother traffic flow with fewer conflicts in the curb lane
- Where possible, streets will have the same number of • traffic lanes as today. Right-turn lanes are added where appropriate to increase intersection capacity



- Temporary disruption to accesses and parking
- Temporary disruption to curbside activities
- Temporary closure of sidewalks and cycling facilities
- Congestion related to construction activity and detours
- Visual effects from construction areas/activities
- Reduction of on-street parking

To mitigate construction impacts, the following measures are proposed:

- Metrolinx will establish Community Liaison Committees • to consult with local stakeholders during detailed design
- Identify alternative parking to support businesses
- Implement Curbside Management Plan for waste removal, deliveries and pedestrian activities

Potential construction impacts include:

- Develop an action plan to support businesses including signage, wayfinding and an ambassador program
- Create Emergency Response Plan; Traffic and Transit Management Plan and Access Management Plan





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Stormwater & Structures

Major culverts and bridges along the BRT corridor have been identified and reviewed to understand the existing hydraulic and structural conditions.

There are 32 crossings along the corridor, including 28 watercourse or drainage ditch crossings, and 4 other crossings of railways and highways.

Modification is recommended at multiple locations. Potential modifications include replacement, rehabilitation, extension or widening to meet current hydraulic standards, strengthen older structures, and accommodate the addition of bus lanes.







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Phase 1 ESA

The intent of the Phase I Environmental Site Assessment (ESA) is to determine if current or historical uses have impacted the soil or groundwater.

An investigation was completed, including a desktop review of contaminant data and field reconnaissance.

The findings suggest that a number of properties have Potentially Contaminating Activities present. Further recommendations will be explored that may affect detailed design, dewatering, construction activities, and other aspects related to the Project

Climate Change

Durham-Scarborough BRT will encourage more sustainable transportation choices and lead to increased climate resiliency. The project will:

- Increasing transit ridership by providing a more reliable, convenient, and comfortable transit service
- Improving existing active transportation facilities and eliminating • gaps in the network

Increase resilience by:

- Including street trees within the boulevard, where feasible
- Implementing Low Impact Development measures, where feasible
- Increasing the size and capacity of structures and culverts to accommodate greater storm events.

The impact of the project shows a decrease in overall greenhouse gas emissions. Mitigation factors include switching from buses from diesel to alternative fuels (e.g., natural gas), blending biological-based fuels, and upgrading buses from conventional internal combustion engine technology to hybrid or electric technology.





Encourage more sustainable modes of transportation by:



