

City of Oshawa

**Proposed Windfields Connection** 

Harmonized Category B Public Work Class Environmental Assessment / Schedule B Municipal Class Environmental Assessment Study

# **Project File Report**

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#### **Executive Summary**

#### EA Project E1

The City of Oshawa (City) conducted this Harmonized Category B Public Work Class Environmental Assessment / Schedule B Municipal Class Environmental Assessment Study for a proposed Windfields Farm Drive Connection from Windfields Farm Drive West to Winchester Road West. The public consultation and decision-making have met the requirements of both Class Environmental Assessments. The two Class Environmental Assessments were considered because the road will be a municipal road (Municipal Class Environmental Assessment) and is crossing Ontario Hydro One property (which has triggered the Infrastructure Ontario Class Environmental Assessment). However, should the Ontario Hydro lands be leased for the crossing, then the requirement to follow the Infrastructure Ontario Class Environmental Assessment may not apply.

#### E1.1 Project Limits

The Study Area is located within in the City of Oshawa, as illustrated in Figure E1.



Figure E1: Study Area

#### E1.2 Consultation

The study was carried out in consultation with the City, Durham Region (Region), Hydro One external agencies, property owners and the public. The consultation included the following:

- One (1) Public Information Centre
- Liaison with external agencies (including Ontario Hydro and Infrastructure Ontario)
- Liaison with Indigenous Peoples

Positive feedback was received on the evaluation and selections of the Technically Preferred Plan through this consultation. Refinements were made based on this input following the Public Information Centre to minimize travel delay from the public travelling from Windfields Farm Drive West. The final study recommendations reflect an iterative process, with input from the public and the Region of Durham in the development of the Intersection Control Study for Winchester Road. All parties provided input into an overall plan that involved a substantial number of stakeholders. The final Recommended Plan includes roundabout control at both Windfields Farm Drive West and at Winchester Road West.

The Project File (this document) will be available to the public, stakeholders and agencies for a 30-day review period from July 12, 2021 to August 10, 2021. The study completion notice was posted on the City website and advertised in the City News Oshawa.

#### **Indigenous Peoples Engagement E2**

The study included Indigenous Peoples engagement. Each Indigenous Peoples community was offered a meeting, separate from the Public Information Centre, if they so desired. A log of all Indigenous Peoples engagement was maintained throughout the Environmental Assessment.

#### Harmonized Public Work and Municipal Class EA Process **E**3

This Study followed both the Infrastructure Ontario Public Work Class Environmental Assessment (2012) and the Municipal Class Environmental Assessment (2015) processes for a Category B and Schedule B Study, respectively. The category and schedule were chosen based on the scope and complexity of the project as well as the estimated capital cost of the project<sup>1</sup> (including construction cost adjustment for annual inflation).

The Study approach followed the Ministry of the Environment, Conservation and Parks guiding principles for EA studies, namely:

Consider all reasonable alternatives;



<sup>&</sup>lt;sup>11</sup> Municipal Class Environmental Assessment, Municipal Engineers Association, 2015 "Municipal Road Projects"

- Provide a comprehensive assessment of the environment; and
- Provide clear and concise documentation of the decision-making process and the public consultation program.

The Class Environmental Assessment Process was undertaken in a series of phases commencing with problem identification and culminating in the filing of a Project File. The Municipal Class Environmental Assessment Process is illustrated in **Figure E2** and the Public Works Class Environmental Assessment Process is illustrated in **Figure E3**. The Class Environmental Assessment process includes an evaluation of all reasonable alternatives and the selection of a preferred alternative(s) with acceptable effects (including avoidance and mitigation of any residual effects) on the natural and social/cultural environments.

The following is the breakdown of tasks for this Schedule B Municipal Class Environmental Assessment project:

- Phase 1: Identify the Problem
- Phase 2: Alternative Solutions
- **Phase 3:** Alternative Design Concepts for Preferred Solution (does not apply for a Schedule B study)
- Phase 4: Environmental Study Report (does not apply for a Schedule B study)
- Phase 5: Implementation (Construction to follow)

The following is the breakdown of tasks for this Category B Public Work Environmental Assessment project:

- Step 1: Describe the Undertaking
- Step 2: Description of Environmental Effects, Mitigation and Monitoring
- Step 3: Consult with Directly Affected Agencies and Public
- Step 4: Reporting
- Step 5: Confirmation of Category B
- Step 6: Notice of Completion and 30 Calendar Day Review
- Step 7: Category Elevations and "Part II Order" Requests, if any





Figure E2: Municipal Class EA Planning and Design Process





Figure E3: Public Works Class EA Planning and Design Process



#### E4 Analysis and Evaluation

Based on the existing conditions and built environment, several cross section and intersection alternatives were developed for the proposed connection. These alternatives require a crossing of four (4) Hydro One transmission lines and an Enbridge pipeline.

#### E4.1 Cross-section Alternatives

Four (4) cross section alternatives were investigated for the new road connection to Winchester Road West:

- Alternative 1: Two-Lane Rural with Multi-Use Path
- Alternative 2: Two-Lane Rural with Paved Shoulders
- Alternative 3: Two-Lane Urban with Multi-Use Path and Sidewalk
- Alternative 4: Two-Lane Urban with Bike Lanes and Sidewalks

#### E4.2 Intersection Alternatives

The Study also considered the intersections of the proposed Windfields Connection with Winchester Road West and Windfields Farm Drive West. Alternatives evaluated at each location include:

- 1. Winchester Road West
  - Alternative 1: Unsignalized Left-Turn Lane and Right-Turn Lane
  - Alternative 2: Signalized Left-Turn Lane and Right-Turn Lane
  - Alternative 3: Roundabout
- 2. Windfields Farm Drive West
  - Alternative 1: Unsignalized 3-Way Stop
  - Alternative 2: Signalized Intersection
  - Alternative 3: Roundabout

#### E5 Technically Preferred Plan and Analysis of Refinements

The initial technical recommendations were presented to the public at the Public Information Centre. These recommendations included:

- Cross Section Alternative 1: Two-Lane Rural with Multi-Use Path;
- Winchester Road West: Stop Control (with potential flexibility to convert to a future roundabout or conventional signalized intersection)
- Windfields Farm Drive West Alternative 3: Roundabout.

The stop control intersection recommendation at Winchester Road West was based on a threelegged intersection and unknown timing of lands to the north. The focus of the comments from the public was to reduce delays associated with the interim stage of stop control.

Based on these comments, the Technical Advisory Committee reviewed the inclusion of the northern lands and the associated future traffic to assess the warrant for traffic signals or roundabout control at Winchester Road West. This confirmed the warrant for signals or roundabout control. The evaluation of traffic signals and roundabout control, including the employment lands to the north, selected roundabout control as the preferred design at this location.

#### E6 Recommended Plan

The Recommended Plan will include a new collector road connecting Windfields Farm Drive West and its new residential community to Winchester Road West. The new collector roadway will be built as a rural cross section (26 m width) including a separate multi-use path connecting to Winchester Road West. The new road will have a 50 km/h posted speed and will not allow parking due to induction from the Hydro One transmission towers .

At Winchester Road West, the intersection control is proposed to be a new single-lane roundabout which will provide a high-quality connection to the side street while also minimizing delays to the arterial roadway. This recommendation includes illumination from the roundabout to Simcoe Street North. This roundabout will provide a significant secondary access to the Windfields Farm community. Property acquisition is recommended at the intersection (where lands are to be acquired) to accommodate future 4-laning of Winchester Road (beyond 2031) by the Region of Durham.

The Recommended Plan also includes property protection for a future 2-lane roundabout. This recommendation is to accommodate the Region of Durham's plans for 4-laning Winchester Road (beyond 2031) as well as protection for a future fourth leg of the Winchester Road West/ Windfields Connection to employment lands, as designated in the Region's Official Plan.

#### E7 Next Steps and Phasing

At the end of the 30-day review period, should there be no objections to the project, the City may proceed with detail design and construction of the Recommended Plan, subject to availability of funding and construction priorities. The works may be phased or built as a single project. If phased the improvements on Winchester Road may delay the roundabout until development occurs north of the intersection, until the 4-laning is implemented by the Region or traffic volumes dictate. If phased the operation of the interim intersection should be monitored for safety.



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Assessment eport

#### **1.0 INTRODUCTION**

A Harmonized Category B Public Work Class Environmental Assessment (Environmental Assessment) / Schedule B Municipal Class Environmental Assessment Study was conducted by the City of Oshawa for a new connection from Windfields Farm Drive West to Winchester Road West. The City's Integrated Transportation Master Plan identified a new collector road for construction by 2023 to service the new Windfields subdivision. This Harmonized Environmental Assessment Study has considered both cross section and intersection alternatives for this new road. Alternatives are being considered to address the transportation needs of the subdivision. The Needs and Justification for the study are defined in more detail in Section 4.0.

This harmonized Environmental Assessment Study documents the transportation need and the Recommended Plan, considering all modes of travel and incorporating environmental protection and mitigation measures.

The public consultation and decision-making met the requirements of both the Public Works and Municipal Class Environmental Assessments. The two Class Environmental Assessments were considered because the road will be a municipal road (Municipal Class Environmental Assessment) and is crossing Ontario Hydro One property (which triggers the Infrastructure Ontario Class Environmental Assessment). Should the Ontario Hydro lands be leased for the crossing, then the requirement to follow the Infrastructure Ontario Class Environmental Assessment may not apply.

#### 1.1 Project Limits

The Study Area is located within in the City of Oshawa, as illustrated in Figure 1.



Figure 1: Study Area



#### 2.0 EA PROCESS

This Study has been completed as a Harmonized Class Environmental Assessment, following the Infrastructure Ontario Public Work Class Environmental Assessment (2012) for a Category B project and the Municipal Class Environmental Assessment (2015) for a Schedule B project.

#### 2.1 Guiding Principles

The Study approach will involve the following Ministry of the Environment, Conservation and Parks guiding principles for Environmental Assessment studies:

- Consider all reasonable alternatives;
- Provide a comprehensive assessment of the environment; and ٠
- Provide clear and concise documentation of the decision-making process and the public • consultation program.

#### 2.2 Environmental Assessment Act Requirements

This Study was initiated as a Category B (Infrastructure Ontario Class EA)/Schedule B (Municipal Class Environmental Assessment) Study, based on the range of anticipated effects and capital cost of the project.

#### **Environmental Assessment Phases**

The Municipal Class Environmental Assessment Process is illustrated in Figure 2 and the Public Works Class Environmental Assessment Process is illustrated in Figure 3. The Class Environmental Assessment process includes an evaluation of all reasonable alternatives and the selection of a preferred alternative(s) with acceptable effects (including avoidance and mitigation of any residual effects) on the natural and social/cultural environments.

The following is the breakdown of tasks for this Schedule B Municipal Class Environmental Assessment project:

- **Phase 1:** Identify the Problem
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NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA

Figure 2: Municipal Class Planning and Design Process





Figure 3: Public Works Class EA Planning and Design Process



#### 3.0 CONSULTATION PROGRAM

The following sections provide a summary of the consultation activities held during the study.

#### 3.1 Notices

Notices for the Study Commencement, Public Information Centre, and Notice of Filing Study Completion were published as follow:

- Study Commencement/ Public Information Centre City News Oshawa: October 16, 2019
- Filing of Study Completion City News Oshawa

Notices were also posted on the City of Oshawa's Facebook page.

See **Appendix A** for the Notice of Study Commencement, Public Information Centre Summary Report and Notice of Study Completion.

#### **3.2Contact Lists**

A mailing list was provided by the City at the start of the study. Additions to the list were made via the Study Commencement/ Public Information Centre Notice in addition to the sign-in sheet and comment sheets from the Public Information Centre. The lists were updated throughout the duration of the study.

An agency contact list was developed and expanded during the study. See Section 3.3.1 for the list of agencies and interest groups.

#### **3.3 Public Information Centre**

The Public Information Centre was held on Wednesday, October 30, 2019 at the Delpark Homes Centre from 5:00 pm to 8:00 pm, see Photo 1.

The Public Information Centre presented a project introduction, environmental inventories, alternative solutions, preliminary design alternatives, evaluation of alternatives, Technically Preferred Alternatives and the Recommended Plan to the public.

All members of the public and interest groups were invited to the Public Information Centre to view the presentation material and to discuss the project with City and consultant representatives.

Nine (9) people registered at the Public Information Centre. Each person was encouraged to provide a written response to any issues or concerns.

Refer to Appendix A for the Public Information Centre Summary Report, including comment sheets (with all personal information removed), the Notice and the Public Information Centre exhibits.



#### 3.3.1 Interest Groups and Agencies

All agencies or groups that may have had an interest in the project or any documentation to contribute to the study were contacted at the start of the Environmental Assessment for their input. All agencies were invited to attend the Public Information Centre.

The following agencies were contacted for information and/or input into the project:

- Region of Durham
- University of Ontario Institute of Technology
- **Tribute Communities**
- Central Lake Ontario Conservation
- Ministry of Heritage, Sport, Tourism and Culture Industries
- Ministry of Natural Resources and Forestry
- Ministry of Agriculture, Food and Rural Affairs
- Ministry of Aboriginal Affairs
- **Environment Canada**
- Fisheries and Oceans Canada
- Canada Post Corporation
- Ministry of Economic Development and Trade
- Ministry of Energy and Infrastructure
- Ministry of Health and Long-Term Care
- Ministry of Municipal Affairs and Housing
- Ministry of Transportation Ontario, Central Region



Photo 1: Public Information Centre

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- Ministry of the Environment, Conservation and Parks
- Ontario Federation of Agriculture Ontario AgriCentre
- Ontario Provincial Police
- GO Transit / Metrolinx
- Union Gas Ontario Inc.
- Trans Northern Pipelines
- Cogeco Cable
- Enbridge Gas Distribution Inc.
- Hydro One
- Oshawa Power and Utilities Corporation
- Bell Canada
- Nexicom

Appendix B compiles select correspondence received from interested agencies.

#### 3.3.2 Indigenous Peoples Engagement

The following Indigenous Peoples groups were contacted at various milestones throughout the Study, including Study Commencement, the Public Information Centre and Study Completion, and were offered individual meetings.

- Alderville First Nation
- MNO Peterborough and District Wapiti Metis Council
- Curve Lake First Nation
- Kawartha Nishnawbe First Nation (Burleigh Falls)
- Metis Nation of Ontario
- Mississaugas of Scugog Island First Nations
- Ontario Secretary of Aboriginal Affairs, Policy and Relationships Branch
- Williams Treaty First Nation
- Hiawatha First Nation
- Metis Nation of Ontario

Appendix B includes select correspondence from these Indigenous Peoples communities.

#### 3.4 Study Design

A Draft Study Design Report was prepared as the initial public document for the Municipal Class Environmental Assessment process and presented a description of the work plan, alternatives, consultation plan and overall study process. The Draft Study Design Report was circulated to agencies, utilities and stakeholders and was posted to the City of Oshawa's website for public review and comments.

No comments were received on the Draft Study Design Report and the document was finalized following the Public Information Centre. See **Appendix C** for the Final Study Design Report.



#### 4.0 NEED AND JUSTIFICATION

The City's Official Plan identified the need for a new collector road for construction by 2023 to service the expanding Windfields subdivision and the need was also confirmed in the Integrated Transportation Master Plan. The proposed collector roadway is needed to:

- Maintain emergency vehicle access for area residents (only two accesses exist for the subdivision and both are on Simcoe Street North);
- Better accommodate subdivision generated traffic;
- Improve access to and from the west to the subdivision; and
- Relieve potential traffic congestion, reducing the volume of left turns onto Simcoe Street North from the subdivision.

The roadway will also provide an alternative linkage for pedestrians and cyclists to access roads and planned cycling facilities on Simcoe Street North. The volume of area traffic will continue to grow as a result of adjacent residential development, the expansion of Ontario Tech University/Durham College and the extension of the Highway 407 Toll Route combined with planned commercial development at Winchester Road West and Simcoe Street North.



#### 5.0 TRANSPORTATION

Winchester Road West (Regional Road 3) is an east-west 2-lane undivided roadway generally parallel to the Highway 407 corridor and connecting to Highway 7 and Highway 12 in Whitby. Simcoe Street North (Regional Road 2) is a north-south 2-lane undivided arterial roadway connecting to nearby Highway 407 and to the rest of Oshawa to the south. Improvements are currently underway to widen Simcoe Street North to 4 through lanes plus turning lanes.

A traffic assessment was completed for the two new intersections at Winchester Road West and Windfields Farm Drive based on the following assumptions:

- 1) The proposed connection could be constructed in 2022;
- 2) Widening of Winchester Road West is identified in the Integrated Transportation Master Plan for beyond 2031 and was therefore not considered in the traffic analysis;
- 3) Future employment lands are identified in the Region of Durham Official Plan to the north of the Study Area and have been included in the traffic volumes, see **Figure 4. The City of Oshawa's Official Plan identifies this area as "Industrial Land Use", see** Figure 5;
- 4) Existing traffic volumes on Winchester Road West were obtained from traffic counts in 2018; and
- 5) Traffic volumes on Windfields Farm Drive West are based on the traffic volumes projected by the Dantonbury Windfields West Phase 4 Transportation Impact Study addendum (2016).

The Traffic Analysis Report is included in Appendix D.

In addition, a design criteria sheet was prepared to receive consensus on the roadway geometric design elements of the new proposed connection. The Design Criteria is included in **Appendix E**.





Figure 4: Region of Durham Official Plan Schedule A (Modified to identify Study Area)





Schedule 'A' Land Use Urban Areas

Special Development Area

City of Oshawa Official Plan	Residential     Downtown Oshawa Urban Growth Centre	<ul> <li>Main Central Area Boundary</li> <li>Sub-Central Area Boundary</li> </ul>
North Half	Planned Commercial Centre Planned Commercial Strip Special Purpose Commercial Institutional	<ul> <li>Community Central Area Boundary</li> <li>Marina Node</li> <li>Recreational Node</li> <li>Tourist Node</li> </ul>
November 2019		Rural Areas
0 250 500 1,000 1,500 Meters	Airport Special Waterfront Area	Estate Residential (refer to section 2.7.3.1)  Prime Agricultural  Action Content of the section
Development Services Department	Utilities Local Central Area	E Limits of Approved Highway 407 Corridor
Notes: 1. This Schedule should be read in conjuction with the text	Boundary of Major Urban Area Built Boundary	Greenland Areas Open Space and Recreation

Figure 5: City of Oshawa Land Use Plan

#### 6.0 ENVIRONMENTAL CONDITIONS

The land uses in the Study Area are active agricultural, with Hydro One high voltage transmission towers located within the corridor and a buried distribution gas main (Enbridge Gas). The lands under Study are provincially owned by the Ministry of Transportation/Infrastructure Ontario/Hydro One.

#### **6.1 Natural Environment**

A Natural Environment Assessment (including terrestrial, fisheries and species at risk) was completed by Roots Environmental. The report summarizes the existing environmental conditions in the area and is included in **Appendix F**.

The majority of the potential impacts to wildlife are associated with vegetation removal, footprint excavation, and grading activities.

Existing vegetation in the Study Area has the potential to support nesting bird species. The *Migratory* Birds Convention Act contains regulations to protect migratory birds, their eggs, and their nests. In accordance with this Act, all clearing must occur outside the nesting season of April 1 – August 31st (Environment Canada).

No fish or fish habitat were identified on the subject property or immediately adjacent. As such, no impacts to fish or fish habitat are anticipated as a result of the undertaking.

One Species at Risk has the potential to be present / impacted in the Study Area:

• Barn Swallow (*Hirundo rustica*) - Barn Swallow (Threatened; T.H.R.) nesting structures were noted on both sides of the proposed road abutting Windfields Farms Drive West. These structures had active nests for the Barn Swallow, which also use the adjacent agricultural lands/hydro corridor for feeding/rearing habitat. It is likely that these structures were constructed by the developer of the adjacent subdivision under the Endangered Species Act for removal of habitat for the subdivision.

Two active barn swallow structures, one on each side of the proposed road, would be impacted by construction and use of the road. The Ministry of the Environment, Conservation and Parks has been contacted to determine the requirement for any registration/permits under the Endangered Species Act for relocation of the affected structures prior to future construction of the road. There are no Provincially Significant Wetlands or Areas of Natural and Scientific Interest in the Study Area.

#### 6.2 Social and Cultural Environmental

#### 6.2.1 Heritage/Cultural

There are no cultural heritage landscapes or built heritage features located in the Study Area. A Built and Cultural Heritage checklist was completed for the Study Area and is included in Appendix G.

#### 6.2.2 Archaeology

A Stage 1 Archaeological Assessment was completed by Central Archaeology Group Inc. The recommendations include the following:

- 1. A Stage 2 Archaeological Assessment should be completed by a licensed consultant archaeologist using test pits for the areas of potential identified in Figure 6.
- 2. No further archaeological assessments are recommended for areas which have been determined to be disturbed.

The detailed report is included in **Appendix H**.



Figure 6: Archaeological Potential Map



	)	from	Stage 1	Archaeological	Assessment
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#### 6.3 Utilities and Municipal Services

There is an existing Hydro One power corridor with two 500 kV tower lines and two 230 kV tower lines that crosses the new collector road. A minimum 15.7 m vertical clearance is required from the top of the road to the cables/wires and a minimum 15 m horizontal clearance was set as the design standard from the base of the tower to the edge of pavement. Sag elevations of the Hydro One lines will be determined during a detail design investigation by Hydro One to determine the final profile of the proposed roadway.

An existing Enbridge pipeline is located at the south of the new collector road and will be crossed.

See **Figure 7** for the location of the hydro transmission towers and Enbridge pipeline. Test pits were completed by the City to determine the exact location of the pipeline where the new road is recommended to be constructed.



**Figure 7: Existing Utility Location Plan** 

#### 6.4 Drainage

Drainage in the Study Area currently flows overland to the south. It flows through a concrete box culvert approximately 70 m south of the Study Area. Roadside ditches will flow towards this culvert and outlet into the storm water management system in the new development. The stormwater system downstream has been sized for this future road.

Due to the profile of the road and Enbridge Pipeline, a storm sewer was recommended to cross the pipeline. Test pits were completed by the City to determine the exact location of the pipeline and it was confirmed that there is no conflict with the storm sewer and pipeline. The Drainage Report is in Appendix I.

#### 6.5Water Resources

To protect ground, surface and storm water during construction, the following will be considered during detail design:

- Dewatering and Excess Water Management;
- Excavation and Sediment Control: and
- Spill Prevention and Contingency.

#### 6.6 Groundwater and Source Water Protection

The Study Area is within the Credit Valley, Toronto Region and Central Lake Ontario Source Protection Region; however, it is not within a Source Water Protection Vulnerable Area (i.e. no wellhead protection area or intake protection zone).

The Study Area is located within the Central Lake Ontario Conservation Authority lands; however, it is not located within a Source Water Protection Area. Industry best practices will be used to prevent spills and / or the release of contaminated material during construction.

#### 6.7 Contaminated Sites and Waste Management

A Phase 1 Environmental Site Assessment was completed by Cambium in the fall of 2019 which determined that there are no areas of potential environmental concern at the Site and that a Phase 2 Environmental Site Assessment is not required. The Phase 1 Environmental Site Assessment Report is included in Appendix J.

#### 6.8 Noise and Vibration

Permanent noise increases as a result of the construction of the proposed connection and intersections and roadway widening are not forecast to be perceptible (sound level changes will be below 3 dBA) based on the expectation that the traffic volumes along the proposed connection are less than 1,000 vehicles per day and that the road will not be a truck route. This magnitude of change



will be imperceptible to the human ear. The construction contractor will have to adhere to City of Oshawa by-laws for construction noise and vibration.

#### 6.9Geotechnical

This portion of the City of Oshawa lies near the border of the physiographic regions of Southern Ontario known as the Iroquois Plain and the South Slope (Chapman and Putnam, 1984). Physiographic mapping in the vicinity indicates that the area is underlain by silt till, ground moraine with a minor occurrence of alluvium. The relief is low, rolling, imperfectly to poorly drained. The soils were deposited during the later Wisconsin period. In general, the deposits are characterized by substantial inter-fingering and inter-layering. The study area is underlain by black shale of the Whitby Formation. The depth of bedrock is anticipated to be approximately 45 m below ground surface.

A geotechnical investigation will be completed during detail design. Detailed drawings are required to obtain a Hydro One permit to drill boreholes for the geotechnical investigations.

#### 6.10 Climate Change

In accordance with the Region of Durham Community Climate Change Local Action Plan and Durham Community Climate Change Adaptation Plan, the project has incorporated and will consider the following design features that will assist the Region in achieving Climate Change and Adaptation goals. This project will incorporate the following design measures that will assist in lowering greenhouse gases and prepare for extreme weather.

#### 6.10.1 Greenhouse Gas Emissions (Air Quality)

The new connection from the Windfields Farm Drive West to Winchester Road West will provide a shorter route for residents from the subdivision to the 407 ETR than currently exists. The shorter route will reduce total commuter auto exhaust output on a daily basis.

The use of a roundabout at the Windfields Connection and Windfields Farm Drive West intersection will reduce auto emissions associated with idling at stop-and-go intersections. A multi-use path and/or sidewalks will provide active transportation and recreational trail connections to the subdivision.

Although the use of tree and shrub vegetation to absorb the carbon emissions will be significantly restricted due to the Hydro One clearance restriction for extra high voltage transmission lines, it is proposed to investigate suitable vegetation during detail design.

#### 6.10.2 Climate Change Adaptation Plan: Increased Runoff

The Windfields Connection cross section will result in increased runoff rates and volumes due to the new pavement. To reduce the runoff temperature before it is discharged to the sewer system and the receiving watercourse, it is proposed to use Low Impact Development measures to capture runoff at its source and allow infiltration and cooling in vegetation. As well, to minimize the potential of an increase in downstream flows resulting from the change in imperviousness, particularly during

extreme rainfall events, the use of wider roadside grassed ditches and storm sewer inlet restrictors to create linear detention areas will be evaluated for effectiveness.

#### 6.11 Land Use

The Region of Durham's Official Plan Schedule A, illustrated in **Figure 4**, identifies a future employment area to the north of the future planned connection. These employment area lands, which include a substantial area of future development to the north of Winchester Road West, are presented in an enlargement of **Figure 4** in **Figure 8**. When developed, these lands will require a fourth leg to the new intersection at the proposed connection/ Winchester Road West.



Figure 8: Enlargement of Region of Durham Official Plan Schedule A

The City of Oshawa's Official Plan identifies the Windfields Part II Plan as approximately 525 hectares of land, bounded as shown in **Figure 9**. The Windfields Planning Area is anticipated to accommodate an ultimate population of approximately 13,000 people. The Official Plan has outlined the land use and road plan and has identified the Windfields Connection (this Environmental Assessment Study) as a Collector Road. Medium density residential lands are planned for the east side of the future connection and low density residential lands are planned for the west side in the Windfields Part II Plan Area, see **Figure 9**.







#### 6.12 Transitway

The Ministry of Transportation Ontario in consultation with the Region of Durham completed an Individual Environmental Assessment Study to address the long-term transportation needs in the Region and surrounding area, see **Figure 10**. The 407 ETR East Environmental Assessment Study was completed in August 2009. The Recommended Design for the Technically Preferred Route includes a transportation corridor and associated support facilities including protection for a dedicated transitway corridor. This transitway corridor is being protected to the north of this Proposed Windfields Connection Environmental Assessment Study Area on the south side of Highway 407 with a planned transitway station west of Simcoe Street, see **Figure 11**. Approximately 18 acres of surplus lands will remain and access to it would be limited to Winchester Road opposite the planned connection. At the time of this study, there was no timeline known for the transitway or station in this location.



Figure 10: 407 East Individual Environmental Assessment and Preliminary Design Study Cover Page





Figure 11: Proposed Transitway Station at Simcoe Street



#### 7.0 GENERATION OF ALTERNATIVES

Based on the existing conditions and built environment, several cross section and intersection alternatives were developed for the proposed connection.

These alternatives are described in the following sections. The Do Nothing alternative has been coarse screened, based on the Need and Justification of the project, as described in **Section 4.0**.

#### 7.1 Cross Section Alternatives

Four (4) cross-section alternatives were investigated:

- Alternative 1: Two-Lane Rural with Multi-Use Path
- Alternative 2: Two-Lane Rural with Paved Shoulders
- Alternative 3: Two-Lane Urban with Multi-Use Path and Sidewalks
- Alternative 4: Two-Lane Urban with Bike Lanes and Sidewalks

Cross sections of the roadway alternatives are shown in **Figure 12** and **Figure 13**, with the plan view presented in **Figure 14**.

#### 7.2 Intersection Alternatives

The Study is also considering the intersection of the proposed Windfields Connection with Winchester Road West and Windfields Farm Drive West. Alternatives evaluated at each location include:

- 1. Winchester Road West
  - Alternative 1: Unsignalized Left-Turn Lane and Right-Turn Lane (Not Carried Forward following inclusion of employment lands triggering signal warrant being met)
  - Alternative 2: Signalized Left-Turn Lane and Right-Turn Lane (with provision for north leg to employment lands)
  - Alternative 3: Roundabout (with provision for north leg to employment lands)
- 2. Windfields Farm Drive West
  - Alternative 1: Unsignalized 3-Way Stop
  - Alternative 2: Signalized Intersection
  - Alternative 3: Roundabout

The intersection alternatives are shown in Figure 15 and Figure 16.





OSHAWA WINDFIELDS CONNECTION PRELIMINARY CROSS SECTION ALTERNATIVES 1&2

2-LANE RURAL

#### Figure 12: Roadway Cross Section Alternative 1 and Alternative 2





OSHAWA WINDFIELDS CONNECTION PRELIMINARY CROSS SECTION ALTERNATIVES 3&4

#### Figure 13: Roadway Cross Section Alternative 3 and Alternative 4









Figure 14: Roadway Plan View Alternatives 1 to 4













Figure 15: Winchester Road West Intersection Alternatives







Figure 16: Windfields Farm Drive West Intersection Alternatives

#### 8.0 EVALUATION OF ALTERNATIVES

The evaluation of the alternatives was completed using a qualitative assessment to compare the net effects and performance of the alternatives. The evaluation considered the advantages and disadvantages of each of the alternatives using evaluation criteria as descriptors to measure the relative differences of the alternatives being considered.

#### 8.1 Evaluation Criteria

The alternatives were evaluated qualitatively using five factor groups:

- Transportation
- Natural Environment •
- Land Use
- Social Environment •
- Cost •

Each factor group included a list of sub-factors to determine the difference between alternatives, such as delays associated with each intersection type or property impacts.

#### **8.2Cross Section Alternatives**

The evaluation of each roadway alternative is illustrated in Table 1.

Table 1: Roadway Alternatives Evaluation					
Evaluation Criteria	Alt 1 2-lane Rural with MUP	Alt 2 2-lane Rural with Paved Shoulders	Alt 3 2-lane Urban with MUP and Sidewalk	Alt 4 2-lane Urban with Bike Lanes and Sidewalks	
Traffic Operations	-	-	-	-	
Active Transportation Safety - Pedestrians	V	X	V	~	
Active Transportation Safety - Cyclists	V	-	V	-	
Emergency Services	(All alternatives provide emergency service access)				
Accessibility	-	-	-	-	
Noise	(All alternatives equal)				
Climate Change (Extreme Weather)		(All alterr	natives equal)		
Water Quality	V	~	-	-	

Table 1: Roadway Alternatives Evaluation				
Alt 1 2-laneAlt 2 2-laneAlt 3 2-laneAlt 4 2-laneEvaluation CriteriaAlt 1 2-lane2-lane Rural with2-lane WUP2-lane with Bike Daved2-lane WUP and Shoulders2-lane Sidewalk2-lane Urba with Bike Lanes and Sidewalk				
(No watercourses. All alternatives require relocation of				
Barn Swallow structures and clearing restrictions to avoid impacting nesting migratory bird species)				
– (No utility relocations required)				
~	~	X	X	
(All alternatives require purchase of property for a 26 m right-of-way)				
(All alternatives require purchase of property for a 26 m right-of-way)				
~	x	X	X	
	Alt 1 2-lane Rural with MUP (No waterco Barn Swallov impa (All alternat (All alternat	Alt 1 2-lane Rural with MUP (No watercourses. All alter Barn Swallow structures an impacting nesting r - (No utility relation (All alternatives require puright) (All alternatives require puright) (All alternatives require puright)	Alt 1 2-lane Rural with MUPAlt 2 2-lane Rural with Paved ShouldersAlt 3 2-lane Urban with MUP and Sidewalk(No watercourses. All alternatives require Barn Swallow structures and clearing rest impacting nesting migratory bird s - (No utility relocations require X(All alternatives require purchase of prop right-of-way)(All alternatives require purchase of prop right-of-way) $\checkmark$ XX	

- Equal/No Change | x Poor/Not Recommended Legend: ✓ Good/Preferred

Alternative 1: Two-Lane Rural with Multi-Use Path was selected at the Technically Preferred Alternative. This alternative provides physical separation for cyclists and pedestrians with minimal cost.

#### 8.3 Windfields Farm Drive West Intersection Alternatives

The evaluation of the Winchester Road West Intersection alternatives is illustrated in Table 2.



Table 2: Windfields Farm Drive West Alternatives Evaluation						
Evaluation Criteria	Alternative 1 Stop Control	Alternative 2 Signalization	Alternative 3 Roundabout			
Traffic Operations	(All alternatives provide a high level of service at the intersection)					
Traffic Safety	-	-	✓			
Design Consistency	X	Х	<ul> <li>Image: A start of the start of</li></ul>			
Active Transportation Safety - Pedestrians	-	-	~			
Active Transportation Safety - Cyclists	-	-	7			
Emergency Services	(All equal)					
Accessibility	(All equal)					
Noise	-	-	✓			
Fisheries/Terrestrial No watercourses. All alternatives require relocation of Ba Swallow structures and clearing restrictions to avoid impacting nesting migratory bird species)						
Utility Relocations (No utility relocations required)						
Preliminary Construction Costs	<b>v</b>	Х	Х			
Property Impacts	perty Impacts (All equal, property was protected during subdivision plan)					
Preliminary Property Cost	(All equal, property was protected during subdivision plan)					
Recommendation	X	X	~			

Legend: 🗸 Good/Preferred	- Equal/No Change	χ Poor/Not Recommended
--------------------------	-------------------	------------------------

The Technically Preferred Alternative for the Windfields Farm Drive West Intersection is the Alternative 3: Roundabout. The Windfields Farm Drive West/proposed Windfields Connection intersection does not warrant traffic signals; however, a roundabout can be implemented before traffic signals are warranted. The Technically Preferred Alternative provides design consistency along Windfields Farm Drive West and provides improved safety for active transportation.

#### 8.4 Winchester Road West Intersection Alternatives

The preliminary evaluation of alternatives was presented to the public at Public Information Centre No. 1 which included initially constructing the Winchester Road West Intersection as a stop control on the south leg. However, based on comments received from the Region of Durham and the public following the Public Information Centre, refinements were developed to reanalyze and reevaluate intersection alternatives, as described in the following sections. The most significant change was to consider the future employment land use plan to the north of the intersection. This increases the volume of traffic using the intersection and satisfies a warrant for traffic signals. The land could accommodate an 18 acre business park which would satisfy the warrant for traffic signals. Timing of the business park is currently unknown but development proposals may be submitted at any time. Based on this traffic trigger, traffic signals or roundabout control alternatives were considered.

#### 8.4.1 Description of Alternatives

Alternative A includes a rural signalized intersection with a design speed and posted speed 80 km/h. The eastbound and westbound approaches each include left-turn lanes and storage for left-turn movements, and the northbound approach includes a northbound left-turn lane and a shared northbound through/right-turn lane. The southbound approach includes a southbound left-turn lane and a shared southbound through/right-turn lane.

Alternative B is a single-lane roundabout with high speed approaches on the east and west legs and low speed approaches on the north and south legs. Future widening for 4-laning Winchester Road West will be accommodated by widening on the outside of the rotary lane.

Alternatives A and B are illustrated in Figure 15.

The assessment of the intersection alternatives considers the land use plan of the employment lands to the north of the intersection for the future Winchester Road West intersection area. The intersection design of either the roundabout or signalized intersection will be based on accommodating a north/fourth leg of the intersection to service planned development, approved in the Official Plan. Based on this analysis, described in the Intersection Control Study Report in **Appendix K**, the future intersection traffic demand will meet the warrant for traffic signals or a roundabout coinciding with the future fourth leg development. Therefore, the following analysis and evaluation compares the two intersection control alternatives: Alternative A (conventional signalized intersection) and Alternative B (roundabout control). In either scenario, there will be a need to facilitate future 4-laning on Winchester Road West beyond the 2031 planning horizon of the Official Plan. The plan will include property protection for the longer term 4-laning of Winchester Road

The following sub-sections therefore focus on the comparison of traffic signal versus roundabout control of the intersection.

#### 8.4.2 Forecast Traffic

The traffic demand at the new intersection is illustrated in **Figure 17** for the am and pm peak hours. Within the limits of the intersection, Winchester Road West is an arterial road with no designated cycle route. The traffic operational analysis was prepared as part of the Intersection Control Study which forecasts the future level of service of each alternative.



The level of service analyses were undertaken using three modelling software packages including:

- Synchro 11 Traffic Modelling software (traffic signals)
- ARCADY software (roundabout used by Region of Durham)
- Vissim modelling software (roundabouts)

The analysis of the traffic signals (Alternative A) has been based on Synchro 11 traffic modelling software and the analysis of the roundabout alternative has used two modelling software programs. The ARCADY software package is produced by Transport Research Laboratory in the United Kingdom for modelling unsignalized intersections including roundabouts. The second modelling tool was the PTV Vissim modelling software for microscopic simulation. MTO utilizes the Vissim modelling tool for complex multi-lane roundabouts. The roundabout operations from the ARCADY analysis are summarized in **Table 3**.



Figure 17: 2032 AM (PM) Peak Hour Traffic Projections

#### Table 3: 2032 Peak Hour Roundabout Operations (ARCADY)

		AM Peak Hour			PM Peak Hour				
Intersection	Movement	v/c	Delay (s)	LOS	95th Queue (m)	v/c	Delay (s)	LOS	95th Queue (m)
	EB	0.51	4	А	1	0.30	3	А	1
Winchester Road	WB	0.27	3	А	1	0.56	5	А	1
West / Windfields	NB	0.10	3	А	1	0.04	3	А	1
Connection	SB	0.03	4	А	1	0.10	4	А	1
	Overall	0.51	4	Α	-	0.56	4	Α	-

#### 8.4.3 Analysis of Alternatives

The following sections provide a description of the operational effectiveness and advantages or disadvantages of the traffic signal or roundabout alternative at this specific location

### Traffic Operations (favours roundabout control)

The traffic operation of the Regional road intersection is likely the most important evaluation criterion as it reflects the long term delays associated with accommodating traffic movements on a Regional road. Although the traffic signal alternative provides a more conventional operation for drivers, it results in longer delays for the majority of traffic operating on the east and west legs of the intersection, to accommodate side road traffic on the lower volume side streets.

As described in the Intersection Control Study Report in **Appendix K**, the peak hour delays associated with the traffic signals average 10-12 seconds per vehicle, whereas the operation of the roundabout control continually shares the variable gaps amongst all vehicles arriving at the intersection. In this location, where the peak movements are in the east-west direction, there should be very few vehicles that require any yield movement of the Regional road traffic.

A common issue with traffic signals is that they have a detrimental effect for locations with low offpeak volumes (such as the employment lands to the north). In off-peak periods when there is low traffic demand on the approaches, the delay to traffic on all approaches is detrimental. Traffic on the major street often continues to be delayed, waiting for traffic signals to change back after sometimes just a single vehicle has long since cleared the intersection. This can lead to driver frustration and safety concerns resulting from potential non-compliance with the signals (an increased number of drivers running the amber signal). Roundabouts do not have this issue. Delays do not occur in the off-peak hours (roundabouts operate freely).

An advantage of the roundabout control is that it is expected to delay the need to 4-lane Winchester Road (through this intersection). This is because it provides higher capacity for



east/west travel compared to traffic signals. Based on these levels of delays, the roundabout intersection control alternative is rated as the preferred alternative compared to traffic signals.

#### Traffic Safety (favours roundabout)

From a traffic safety perspective, roundabout control has significantly fewer conflict points when compared to a conventional signalized intersection. At this location, there would be 32 conflict points for a conventional signalized intersection as compared to 8 for roundabout control, as illustrated in **Figure 18**. Almost as important is the severity of collisions when they occur.

With the signalized intersection alternative, collision events can have high severity associated with large speed differentials i.e. side swipe collisions and T-bone collisions. In contrast, the roundabout operation involves low speed differentials (less than 25 km/h differentials) which ensure that should a collision occur, they are typically property damage only and no fatal type collisions.

Provision of a roundabout would improve the safety of the intersection. Roundabouts have significantly fewer conflict points and are forecast to have 67% less collisions and 75% less severity with these collisions compared to traffic signals. Any collisions involve low speed property damage only as opposed to the higher speed collisions (injury and fatal type collisions) that can occur at signalized intersections. (Source: NCHRP 672 (pages 5-15)).



**Figure 18: Intersection Conflict Points** 

#### Pedestrian and Cyclist Safety (minor advantage of roundabout control)

With regard to pedestrians, roundabouts have generally been judged to be safer than conventional intersections. As shown on **Figure 19**, a 4-leg roundabout has only 8 vehicle-to-pedestrian conflict points whereas a conventional cross intersection has up to 16 conflict points. Traffic signals can potentially reduce the risk of vehicle-pedestrian conflicts by allowing only a few movements at any time, but conflicts still exist with red light running (illegal), right turn on red (usually legal) and left/right turn on green (legal).

Data from the Region of Waterloo from 1.2 million pedestrian crossings at Regional roundabouts in a 5 year period identified very few pedestrian collisions. There has not been a single pedestrian hit in a roundabout in the Region of Waterloo that has been in operation for less than five years. For all roundabouts, the average number of pedestrians hit is approximately one third lower than the number hit at traffic signals. Pedestrians place false confidence where the flashing walk symbol tells pedestrians that it is safe to cross. Roundabouts require both pedestrians and drivers to decide when it is safe to drive through the intersection. At traffic signals, there are many competing tasks for the driver's attention.

At this specific intersection location, pedestrian movements will primarily be to/from the employment lands or to the transit station to the north when these are implemented.

Bicycle-related conflicts can be associated to vehicle-to-vehicle or vehicle-to-pedestrian conflicts depending on whether the cyclist remains in the shared traffic lane through the intersection or uses the adjacent pathway and crossings.

In a roundabout, it has been determined that the risk of collision is increased when the cyclist circulates on the right side of the roadway because their visibility is reduced as they are exposed to conflict with entering and exiting drivers. To avoid this issue, cyclists are recommended to either position themselves to the middle of the travelled lane as they circulate through the roundabout, or to use pathways and crossings around the roundabout.

In this location, there is no designated cycle route on Winchester Road and there will not be significant volumes or turning movements of cyclists. Therefore, cycling safety is considered equal among the two alternatives.



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#### Figure 19: Pedestrian Conflict Point Comparison (Source: NCHRP 672 Roundabouts, an Informational Guide, TRB)

#### Design Consistency (favours traffic signal control)

Providing design consistency on a roadway improves its safety due to driver familiarity. Typically, this would favour a signalized intersection; however, many roundabouts are being planned in Oshawa, the closest being to the south on Thornton Road.

#### Economic/ Business Exposure (slightly favours roundabout control)

This is not typically considered when a road authority is assessing the intersection control. However, roundabout control is considered superior to signalization for businesses in close proximity to the intersection as they all receive exposure to every driver travelling through the intersection. Drivers slow down and are subconsciously exposed to local businesses. This can occur at a signalized intersection during the red phase (when cars are stopped) but it is less prevalent as more traffic passes through the intersection on green phases at higher speeds. BT Engineering Inc. completed a survey of all businesses adjacent to the roundabout constructed in the Town of Picton on Highway 33 (first roundabout constructed on a Provincial highway) following implementation. All businesses reported higher revenue post roundabout construction.

#### Large Agricultural Equipment and Transport Trucks (equal)

A design standard can be developed to accommodate both large transport trucks and large combines.

#### Construction Cost (favours signalized intersections)

From a cost perspective, a signalized intersection is typically approximately 10% less in cost than a roundabout control design. The higher cost is typically associated with traffic staging to construct the roundabout. However at locations where the roundabout is offset from the centre of the road these costs can be equal since the majority of the roundabout is built in a "greenfield".

#### Future Longer Term Operational Costs (favours roundabout control)

Future longer term operational costs typically favour roundabout control. These costs are a responsibility of the road authority and include operation, servicing, and replacement of mechanical equipment (traffic signals) and electricity. When considering total life cycle costs, the future operational costs typically offset the lower initial capital cost of a signalized intersection.

#### Property Impacts (favours signalized intersections)

The loss of property and impacts to property owners is often a main reason for choosing signalized intersection control. At the entrance to the employment lands, the property impacts could be considered less of a concern since it is expected to be limited to the business park site and other lands will be from public agencies (Ontario Hydro/Ministry of Transportation Ontario).

#### Intersection Spacing (favours roundabout control)

The desirable spacing of arterial road intersections is 400 m. This distance allows for the coordination of adjacent traffic signals (if required), and to accommodate the traffic queuing at a traffic signal while allowing for the left-turn storage lanes, signage, driver recognition of the intersection and directional signage requirements. There is approximately 800 m spacing between Simcoe Street and the new connection which allows for a third signalized intersection in this area. The installation of a roundabout at the Winchester Road West/proposed connection to Windfields Farm Drive West would reduce the potential for traffic queuing typically associated with traffic signals should an intermediate intersection be built. In addition, if roundabout control were selected it would be possible to use right-in/right-out control for any development to the east of the proposed connection and on the south side of Winchester Road West, as well as accommodating a u-turn movement for any westbound vehicles to eliminate a westbound left-turn lane.

The evaluation of Winchester Road West alternatives is in Table 4.



Table 4: Evaluation of Winchester Road West Intersection Alternatives			Table 4: Evaluation	of Winchester Road We	est Intersection Alternatives
Criteria	Alternative A Traffic Signals	Alternative B Roundabout	Criteria	Alternative A Traffic Signals	Alternative B Roundabout
Traffic Operations			Noise		$\checkmark$
Level of Service (Regional Road)	- Level of Service B	√ Level of Service A (minimal delay)		-	(1-2 dBA reduction compared to signals)
Level of Service (Collector Road) Potential to Defer 4-laning	- Level of Service C	√ Level of Service A (minimal delay)	Air Quality	-	√ (reduced carbon emissions by eliminating vehicle idling)
Winchester Road West		V Doundohout control has the notantial	Land Use and Property		
	-	to defer widering Winchester Deed	Area required	48 m <sup>2</sup>	1112 m <sup>2</sup>
			Capital Cost	\$1.2 M	\$1.32 M
Ability to Allow Region to Control Development on the South Side Between Simcoe Street North and New Connection Intersection to Right-in/Right-out control <b>Safety</b> Safety (net present value of collisions) Number of Conflict Points	- X \$4.3 M X	√ (accommodates u-turn movement for westbound lefts to development lands)	Overall Recommendation	x	✓ The overall study recommendation is for the installation of a roundabout control. This is primarily based on improved performance for operation and safety and the availability of property. These benefits are considered to outweigh the estimated higher capital cost of the roundabout.
Safety (Severity of Collisions)	(32 conflict points) - (distribution of 0.3% fatal, 21.7 % injury and 78% PDO based on the higher speed location)	(8 conflict points) √ The severity will be reduced by approximately 75% (Ref National Cooperative Highway Research Program 672)	Legend: 🖌 Good	//Preferred   - Equal/No C	Change χ Poor/Not Recommended
Safety (Frequency of Collisions)	- (0.8 collisions per million vehicles entering intersection)	√ The frequency will be reduced by approximately 67% (Ref National Cooperative Highway Research Program 672)			
Safety of Pedestrians (crossings)	-	$\checkmark$			
Safety of Cyclists	-	-			
Natural Environment	·				
Aquatic Environment		Equal			
Terrestrial Environment		Equal			



#### 9.0 RECOMMENDED PLAN

The Recommended Plan includes an interim and ultimate design to accommodate the future widening of Winchester Road West. The Interim Recommended Plan and Profile are illustrated in **Figure 20** and **Figure 21**, respectively. The Ultimate Recommended Plan and Profile are illustrated in **Figure 22** and **Figure 23**, respectively. The profile of Winchester Road West is illustrated in **Figure 24** and remains unchanged from the existing profile. Each of these designs meeting the standards of the Region of Durham as described in **Appendix K**.





Figure 20: Interim Recommended Plan





Figure 21: Interim Recommended Profile





Figure 22: Ultimate Recommended Plan





Figure 23: Ultimate Recommended Profile



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Figure 24: Winchester Road West Profile















#### **10.0 ENVIRONMENTAL EFFECTS AND MITIGATION**

Effects on the environment were considered in accordance with the Municipal Class Environmental Assessment process.

The Recommended Plan will be mitigated to minimize or remove any remaining detrimental effects. **Table 5** provides a description of the effects and proposed mitigation for the Recommended Plan.

Table 5: Proposed Mitigation				
Effects/Comment	Interested Party	Mitigation		
Potential for dewatering during subsurface infrastructure construction	Ministry of the Environment, Conservation and Parks	If any subsurface works are identified and dewatering is anticipat Design. If required, this will be discussed with Ministry of the Env appropriate sediment and erosion control plan and a dewatering developed.		
Potential for erosion / sedimentation during construction	Ministry of the Environment, Conservation and Parks.	Standard erosion and sediment control measures will be incorpor measures to prevent off-site transport of sediment and prompt res		
The project will result in the generation of waste asphalt, granular, concrete and possibly earth materials	Ministry of the Environment, Conservation and Parks	Excess generation will be minimized through promoting contracto		
Potential construction disruption to various festivals / events	City/ Public	Schedule construction activities to limit / avoid disruption to major		
Noise from construction equipment and vehicles during construction	City/ Public	Maintain equipment in good operating condition to prevent unnec Restrict idling of equipment to the minimum necessary to perform The Contractor will be required to comply with City of Oshawa no measures, investigate noise complaints, and comply with Ministry sound level criteria for construction equipment.		
Proximity to Barn Swallow (Threatened) nesting structures	Ministry of the Environment, Conservation and Parks	Nesting structures for the threatened Barn Swallow adjacent to the West will be relocated to the west side of the proposed connection habitat to the nesting structures.		
Potential Removal of Migratory Bird Nesting Habitat	Ministry of the Environment, Conservation and Parks	Any removal of vegetation shall occur outside the migratory bird r		



#### ted, the impacts will be determined during Detail vironment, Conservation and Parks and an and wastewater management plan will be

rated into the construction contract – including storation of disturbed areas.

or salvage, recycling and re-use in the contract.

r festivals / events (where possible).

cessary noise.

the work.

bise bylaws, implement general noise control y of the Environment, Conservation and Parks

he south entrance from Windfields Farms Drive on to provide an appropriate flight path from the

nesting period of April 1 – August 31<sup>st</sup>.

Table 5: Proposed Mitigation				
Effects/Comment	Interested Party	Mitigation		
Source Water Protection	Ministry of the Environment, Conservation and	The Study Area is within the Credit Valley, Toronto Region and C however, it is not within a Source Water Protection Vulnerable Are protection zone).		
	Parks	Industry best practices and Central Lake Ontario Conservation Au spills and / or the release of contaminated material during constru		
Stormwater Management	Ministry of the Environment, Conservation and Parks	Stormwater management will be in accordance with the City of Os Conservation Authority Regulations, the Ministry of the Environme Management Planning and Design Manual and all stormwater info Section 53 of the Ontario Water Resources Act.		
Climate Change and Global Warming	Ministry of the Environment, Conservation and Parks	Wider roadside grassed ditches to create linear detention areas w pavement. The provision of a multi-use path promotes active tran vehicular trips.		
Traffic operations – delay during construction	City/Region	Provide advance notice of all closures/lane reductions/detours. Prepare and implement Traffic Management Plan during construct		
Potential impact to emergency services during construction	City/Region	Prepare and implement Traffic Management Plan during construct Ensure ongoing and advance communication with emergency ser		
Potential damage to or loss of archaeological artefacts	Ministry of Heritage, Sport, Tourism and Culture Industries	A Stage 1 Archaeological Assessment has been completed which Assessment on previously undisturbed lands. If deeply buried arc construction, construction will be stopped in the vicinity of the disc Ministry of Heritage, Sport, Tourism and Culture Industries.		
Hydro One transmission line conductor impacts on vehicles on the proposed connection	Hydro One	Commitment to "No Parking" signage installed on the proposed construction of the proposed construction		



Central Lake Ontario Source Protection Region; rea (i.e. no wellhead protection area or intake

uthority regulations will be followed to prevent uction.

Oshawa Regulations, Central Lake Ontario nent, Conservation and Parks Stormwater frastructure will be approved in accordance with

will be evaluated for increased runoff due to new nsportation which reduces the number of

ction.

ction.

rvice providers during construction.

n recommends a Stage 2 Archaeological chaeological remains are encountered during covery and the contractor must notify the

connection to prevent parking underneath the

#### **11.0 FUTURE ACTIVITIES AND PHASING**

At the end of the 30-day review period, should there be no objections to the project, the City may proceed with detail design, contract document preparation and construction of the Recommended Plan, subject to availability of funding and construction priorities. The works may be phased or built as a single project. If phased the improvements on Winchester Road may delay the roundabout until development occurs north of the intersection, until the 4-laning is implemented by the Region or traffic volumes dictate. If phased the operation of the interim intersection should be monitored for safety.

Following Environmental Assessment clearance, this project, or any individual element of this project, may proceed to detail design and construction. Mitigation measures listed in **Section 10.0** are to be incorporated into contract documents during detail design and carried out during construction, as appropriate.



## **Glossary of Terms**

Class Environmental Assessment Document

•	A.A.D.T.	Annual Average Daily Traffic – the average	
		24-nour, two-way traffic for the period from	
•	Alianmont	The vertical and horizontal position of a	
•	Anghinen	road.	
٠	Alternative	Well-defined and distinct course of action	<ul> <li>Class Environmental Assessment Process</li> </ul>
		that fulfils a given set of requirements. The	
		EA Act distinguishes between alternatives	
		to the undertaking and alternative methods	
_	Alternative Dianning Colutions	Alternative wave of activing problems or	
•	Alternative Planning Solutions	Alternative ways of solving problems of	
		Indertaking)	Compensation
•	Alternative Design Concents	Alternative ways of solving a documented	Compensation
•	Alternative Design Concepts	transportation deficiency or taking	
		advantage of an opportunity. (Alternative	
		methods of carrying out the undertaking).	Consortium
٠	Alternative Project	Alternative Planning Solution, see above.	
•	A.N.S.I.	Area of Natural or Scientific Interest	Corridor
•	Berm	Earth landform used to screen areas.	
•	BMP	Best management practice.	
٠	Bump-Up	The act of requesting that an environmental	
		assessment initiated as a class	Criterion
		Environmental Assessment be required to	Cumulative Effects Accomment
		follow the individual Environmental	Cumulative Effects Assessment
		Assessment process. The change is a	
		the Minister of Environment Conservation	
		and Parks to require that an individual FA	
		be conducted. (See also Part II Order).	
•	Bypass	A form of realignment in which the route is	
		intended to go around a particular feature	
	Canadian Environmental Assessment Act (C.E.A.A.)	or collection of features.	
٠		The C.E.A.A. applies to projects for which	<ul> <li>Decibel (dB)</li> </ul>
		the federal government holds decision-	
		making authority. It is legislation that	
		identifies the responsibilities and	
		procedures for the environmental	
		assessment.	



t	An individual environmental report documenting a planning process which is formally submitted under the Environmental Assessment Act. Once the Class E.A. document is approved, projects covered by the class can be implemented without having to seek further approvals under the Environmental Assessment Act provided the Class EA process is followed.
	A planning process established for a group of projects in order to ensure compliance with the Environmental Assessment Act. The Environmental Assessment Act, in Section 13 makes provision for the establishment of Class Environmental
	Assessment s.
	The replacement of natural habitat lost through implementation of a project, where implementation techniques and other measures could not alleviate the effects.
	A group of businesses or organizations allied to take on a project.
	A band of variable width between two locations. In transportation studies a corridor is defined area where a new or improved transportation facility might be located.
	Explicit feature or consideration used for comparison of alternatives.
	Cumulative Effects Assessment assesses the interaction and combination of the residual environmental effects of the project during its construction and operational phases on measures to prevent or lessen the predicted impacts with the same environmental effects from other past, present, and reasonably foreseeable future projects and activities.
	A logarithmic unit of measure used for expressing level of sound.

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• dBA	'A' weighted sound level; the human ear cannot hear the very high and the very low sound frequencies as well as the mid- frequencies of sound, and hence the	Equivalent Sound Level (Leq)
	predicted sound levels, measured in dBA, are a reasonable accurate approximation of sound levels heard by the human ear.	Evaluation
Detail Design	The final stage in the design process in which the engineering and environmental components of preliminary design are refined and details concerning, for example, property, drainage, utility	Evaluation Process
- DEO	relocations and quantity estimate requirements are prepared, and contract documents and drawings are produced.	External Agencies
Environmental Assessment Act	amended by S.O. 1996 C.27), RSO 1980.	Factor
Environment	Air, land or water,	• H.A.D.D.
	<ul> <li>Plant and animal life, including man,</li> </ul>	
	<ul> <li>The social, economic and cultural conditions that influence the life of man or a community.</li> </ul>	<ul> <li>Harmonized Environmental Assessment Process</li> </ul>
	<ul> <li>Any building structure, machine or other device or thing made by man,</li> </ul>	<ul> <li>Individual Environmental Assessment</li> </ul>
	<ul> <li>Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities or</li> </ul>	Mitigating Measure
	man, or	
	<ul> <li>Any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.</li> </ul>	Mitigation
Environmental Effect	A change in the existing conditions of the	• M.N.R.F.
	environment which may have either beneficial (positive) or detrimental (negative) effects.	Noise Attenuation
Environmentally Sensitive Areas	Those areas identified by any agency or level of government which contain natural features, ecological functions or cultural	
	historical or visual amenities which are susceptible to disturbance from human activities and which warrant protection.	• N.S.A.



 The level of a continuous sound having the same energy as a fluctuating sound in a given time period. In this report Leq refers to 24-hour, 16 or 18-hour averages.
The outcome of a process that appraises the advantages and disadvantages of alternatives.
The process involving the identification of criteria, rating of predicted impacts, assignment of weights to criteria, and aggregation of weights, rates and criteria to produce an ordering of alternatives.
Include Federal departments and agencies, Provincial ministries and agencies, conservation authorities, municipalities, Crown corporations or other agencies other than the Ministry of Transportation Ontario.
 A category of sub-factors.
 Harmful Alternation, Disturbance or Destruction of fish habitat. Harmonized planning process for this project that will meet both the Provincial
 and Federal EA requirements. An environmental Assessment for an undertaking to which Assessment the E.A Act applies and which requires formal review and approval under the Act.
A measure that is incorporated into a project to reduce, eliminate or ameliorate detrimental environmental effects.
 Taking actions that either remove or alleviate to some degree the negative impacts associated with the implementation of alternatives.
 Ministry of Natural Resources and Forestry
A mitigation measure used to lessen the intensity of the noise level (dBA) where the noise level is increased in a noise sensitive area greater than 5 dBA 10 years after completion.
 Noise Sensitive Area is a noise sensitive land use, which has an outdoor living area associated with the residential unit.

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• O.L.A.	Outdoor Living Area is the part of an outdoor amenity area provided for the quiet	Realignment
Part II Order	enjoyment of the outdoor environment. The act of requesting that an environmental assessment initiated as a class Environmental Assessment be required to follow the individual Environmental Assessment process. The change is a result of a decision by the proponent or by the Minister of Environment, Conservation and Parks to require that an individual EA be conducted. (See also Bump-up).	Recommended Plan
• Flaming Alternatives	methods" under the EA Act. Identification of significant transportation engineering opportunities while protecting significant environmental features as much as	
Planning Solutions	That part of the planning and design process where alternatives to the undertaking and alternative routes are identified and assessed. Also described as	<ul> <li>Route Alternatives</li> <li>S.A.D.T.</li> </ul>
Prime Agricultural Areas	Act. Prime agricultural areas as defined in municipal official plans and other	Screening
Project	A specific undertaking planned and implemented in accordance with this Class EA including all those activities necessary to solve a specific transportation problem	<ul> <li>Sub-factor</li> <li>T.A.C.</li> </ul>
Project File	The final product of a Schedule B project. This is a completion of all data/reports	Traceability
Proponent	A person or agency that carries or proposes to carry out an undertaking, or is the owner or person having change, management, or control of an undertaking.	Undertaking
Public	Includes the general public, interest groups, associates, community groups, and individuals, including property owners.	
Public Information Centre	Consultation event to present the study to the public, agencies, stakeholders and Indigenous Peoples communities.	



Replacement or upgrading of an existing roadway on a new or revised alignment. That part of the planning and design process, during which various alternative solutions are examined and evaluated including consideration of environmental effects and mitigation; the recommended design solution is then developed in sufficient detail to ensure that the horizontal and vertical controls are physically compatible with the proposed site, that the requirements of lands and rights-of-way are satisfactorily identified, and that the basic design criteria or features to be contained in the design, have been fully recognized and documented in sufficient graphic detail to ensure their feasibility. Location alternatives within a corridor. Summer Average Daily Traffic – the average 24-hour, two-way traffic for the period from July 1<sup>st</sup> to August 31<sup>st</sup> including weekends. Process of eliminating alternatives from further consideration, which do not meet minimum conditions or categorical requirements. A single criterion used for the evaluation. Each sub-factor is grouped under one of the factors. **Technical Advisory Committee** Characteristics of an evaluation process which enables its development and implementation to be followed with ease. In keeping with the definition of the Environmental Assessment Act, a project or activity subject to an Environmental Assessment.