SCHEDULE C DRYDEN BOULEVARD EXTENSION ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL STUDY REPORT

FINAL • SEPTEMBER 2018

REPORT PREPARED FOR
TOWN OF WHITBY
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EAST
WHITBY, ON L1N 2M8
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TMIG PROJECT NUMBER 17122

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1 INTRODUCTION AND BACKGROUND

The Town of Whitby has undertaken a Municipal Class Environmental Assessment (Class EA) to examine the need for an extension of Dryden Boulevard from Deverell Street to Thickson Road to accommodate the ongoing growth in the area.

The study is being carried out in accordance with the planning and design process for ‘Schedule C’ projects as outlined in the Municipal Engineers Association "Municipal Class Environmental Assessment" document (October 2000; amended 2007, 2011 and 2015), which is approved under the Ontario Environmental Assessment Act.

1.1 Study Area

The Class EA study area focused on Dryden Boulevard corridor from Anderson Street to Garrard Road in the Town of Whitby. The Class EA study area is shown in the red dashed boundary (Figure 1). The traffic analysis, however, focused on a much larger study area bounded by Taunton Road to the north, Rossland Road to the south, Brock Street to the west and Thornton Road to the east. This is shown by the green dashed line in Figure 1 below. The land use within the study area is predominately residential. A portion of the Class EA study area is within the jurisdiction of Central Lake Ontario Conservation (CLOCA).

Figure 1 – Study Area
2  CLASS ENVIRONMENTAL ASSESSMENT PROCESS

2.1 Class Environmental Process Overview

The planning of major municipal projects or activities is subject to the Ontario Environmental Assessment (EA) Act, R.S.O. 1990, and requires the proponent to complete an Environmental Assessment, including an inventory and description of the existing environment in the area affected by the proposed activity.

The Class EA process was developed by the Municipal Engineers Association, in consultation with the Ministry of the Environment, Conservation and Parks (MECP), as an alternative method to Individual Environmental Assessments for recurring municipal projects that were similar in nature, usually limited in scale and with predictable range of environmental effects which were responsive to mitigating measures.

The Class EA provides for the four following designations of the project depending upon potential impacts:

**Schedule A** - Projects are limited in scale, have minimal adverse environmental effects and include a number of municipal maintenance and operational activities. These projects are pre-approved. Schedule A projects generally include normal or emergency operational and maintenance activities.

**Schedule A+** - Projects are within existing buildings, utility corridors, rights-of-way, and have minimal adverse environmental effects. These projects are pre-approved; however, the public is to be notified prior to project implementation.

**Schedule B** - Projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process, involving mandatory contact with directly affected public and relevant review agencies, to ensure they are aware of the project and that their concerns are addressed. If there are no outstanding concerns, then the proponent may proceed to implementation.

**Schedule C** - Projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA document. Schedule C projects require that an Environmental Study Report be prepared and filed for review by the public and review agencies.

The proposed Dryden Boulevard extension includes “the construction of a new road” and “the construction of new water crossing” which are the triggers for Schedule B EA process. Since the estimated construction cost exceeds $2.4
million, the EA will follow the Schedule C EA process. The following Class EA planning phases apply:

**Phase 1** – Identify the problem (deficiency) or opportunity.

**Phase 2** – Identify and evaluate alternative solutions to address the problem or opportunity by taking into consideration the existing environment, and establish the preferred solution taking into account public and review agency input.

**Phase 3** – Identify Alternative Design Concepts for the preferred solution implementation by taking into consideration the existing environment and establish the preferred design concept by taking into account public and review agency input.

**Phase 4** – Document Environmental Assessment process that includes the design and consultation process in Environmental Study Report for public review.

**Phase 5** – Complete contract drawings and documents and proceed to construction and operation; monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the completed facility.

The Class EA process also provides an appeal process to change the project status. Under the provisions of subsection 16 of the amended EA Act, there is an opportunity under the Class EA planning process for the Minister to review the status of a project. Members of the public, interest groups and review agencies may request the Minister to require a proponent to comply with Part II of the EA Act, before proceeding with a proposed undertaking. This is known as a “Part II Order” (formerly called “Bump-Up Request”). The Minister determines whether this is necessary with the Minister’s decision being final. The procedure for dealing with concerns which may result in the Minister, by order, requiring the proponent to comply with Part II of the Act is outlined in the Municipal Class Environmental Assessment document.

Following the end of the 30-day public review period, if there are no outstanding Part II Order Requests, the project may proceed to Phase 5 of the Class EA process to complete design and the contract drawings and tender documents, and then move on to construction.

A flow chart describing the Class EA planning and design process is shown in Figure 2.
Figure 2 – Class EA Planning Flow Chart (MEA 2000, update 2015)
2.2 Project Team

The Town of Whitby retained The Municipal Infrastructure Group Ltd. to undertake the Schedule C Class Environmental Assessment. The key members of the project team are listed in Table 1.

Table 1 – Project Team

<table>
<thead>
<tr>
<th>The Town of Whitby</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horace Look, P.Eng., Project Manager</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Central Lake Ontario Conservation Authority</th>
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</thead>
<tbody>
<tr>
<td>Eric Cameron, Infrastructure Planner / Enforcement Officer</td>
</tr>
<tr>
<td>Perry Sisson</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The Municipal Infrastructure Group Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dale Dionne, P.Eng., MBA, PMP</td>
</tr>
<tr>
<td>Nathalie McCutcheon, P.Eng.</td>
</tr>
<tr>
<td>Steve Hollingsworth M.A.Sc., P.Eng.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-Consultants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dillon Consulting Ltd. - Traffic Consultants</td>
</tr>
<tr>
<td>Golder Associates – Archaeological Assessment, Cultural Heritage, Natural Environment, Noise Impact</td>
</tr>
<tr>
<td>GEO Morphix Ltd. – Geomorphological Study</td>
</tr>
<tr>
<td>JM2S Ltd. – Structural Engineering</td>
</tr>
<tr>
<td>RWDI – Air Quality Assessment</td>
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</tbody>
</table>
3  PUBLIC AND AGENCY CONSULTATION

3.1 Public Consultation Program

The communication and public consultation plan was prepared in accordance with Municipal Class EA Schedule Process to ensure that the public and key stakeholder has the opportunity to become engaged with the project over the course of the EA in a way that is important to them. The comments provided by the public were considered throughout the project.

The objective of communications and public consultation were as follows:

- Inform the public and stakeholders about the project;
- Provide a way for the public to provide the project team with their comments;
- Build and maintain respectful, professional relationships with the Town of Whitby, "the Region of Durham, Central Lake Ontario Conservation Authority and other stakeholders;
- Respect the comments provided by the public and stakeholders;
- Help members of the public learn about the EA process;
- Meet the First Nations ‘duty to consult’ requirements and ensure First Nations are notified of the project activities and are given an opportunity to provide comments;
- Balance the advice of various stakeholders and understand their decision-making process;
- Complete communications and public consultation that will contribute to MECP approval;

3.2 Public Notices

Public notices were published for the following consultation activities:

- Notice of Study Commencement and Community Open House No. 1 – June 7 and June 15, 2017.
- Notice of Study Completion – October 4 and October 11, 2018.

The notices were published in the Whitby This Week newspaper, Town of Whitby’s website, mailed to residents in the Study Area, and mailed to the agencies listed in section 3.3. A copy of the public notices are included in Appendix A.
### 3.3 Agency and Stakeholder

The following agencies were identified and contacted as part of the consultation process:

#### Table 2 – Agency and Stakeholder List

<table>
<thead>
<tr>
<th>Federal Contacts</th>
<th>Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada Post Corporation</td>
<td>Whitby Emergency and Fire Services</td>
</tr>
<tr>
<td>Indian and Northern Affairs Canada - Comprehensive Claims Branch Assessment and Historical Research Directorate</td>
<td>Durham Catholic District School Board</td>
</tr>
<tr>
<td>Indian and Northern Affairs Canada - Environment and Natural Resources Lands and Trust Services</td>
<td>Durham District School Board</td>
</tr>
<tr>
<td>Indian and Northern Affairs Canada - Environment Unit</td>
<td>Durham Region EMS</td>
</tr>
<tr>
<td>Indian and Northern Affairs Canada - Litigation Management and Resolution Branch</td>
<td>PVNC Catholic District School Board</td>
</tr>
<tr>
<td>Indian and Northern Affairs Canada - Specific Claims Branch</td>
<td>Region of Durham</td>
</tr>
<tr>
<td>Ontario Ministry of Indigenous Relations and Reconciliation</td>
<td>Town of Whitby</td>
</tr>
<tr>
<td>Ontario Ministry of Indigenous Relations and Reconciliation - Policy and Relationships Branch</td>
<td></td>
</tr>
<tr>
<td>Durham Regional Police</td>
<td></td>
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<tr>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td>Central Lake Ontario Conservation Authority</td>
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</tbody>
</table>

**Interested Parties**

<table>
<thead>
<tr>
<th>Ontario Cycling Association</th>
</tr>
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<tbody>
<tr>
<td>Oshawa &amp; Durham Region Metis Council</td>
</tr>
<tr>
<td>Whitby Chamber of Commerce</td>
</tr>
<tr>
<td>Durham Agricultural Advisory Committee</td>
</tr>
<tr>
<td>Durham Emergency Management Office</td>
</tr>
<tr>
<td>Durham Region Ambulance Services</td>
</tr>
<tr>
<td>Durham Region Environmental Advisory Committee (DEAC)</td>
</tr>
<tr>
<td>Durham Region Federation of Agriculture</td>
</tr>
<tr>
<td>Durham Region Field Naturalists</td>
</tr>
<tr>
<td>Durham Region Health Department</td>
</tr>
<tr>
<td>Durham Region Transit Commission</td>
</tr>
<tr>
<td>Durham Student Transportation Services</td>
</tr>
<tr>
<td>Durham Trails Coordinating Committee</td>
</tr>
<tr>
<td>Student Transportation Services of Central Ontario (STSCO)</td>
</tr>
</tbody>
</table>

**Provincial Contacts**

<table>
<thead>
<tr>
<th>Ontario Ministry of Agriculture, Food and Rural Affairs</th>
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</thead>
<tbody>
<tr>
<td>Ontario Ministry of Community and Social Services</td>
</tr>
<tr>
<td>Ontario Ministry of Consumer and Business Services</td>
</tr>
<tr>
<td>Ontario Ministry of Culture</td>
</tr>
<tr>
<td>Ontario Ministry of Energy and Infrastructure - Places to Grow</td>
</tr>
<tr>
<td>Ontario Ministry of Environment and Climate Change - Central Region</td>
</tr>
</tbody>
</table>
Ontario Ministry of Environment and Climate Change - Environmental Assessment and Approvals Branch
Ontario Ministry of Environment and Climate Change - York-Durham District Office
Ontario Ministry of Housing
Ontario Ministry of Municipal Affairs
Ontario Ministry of Natural Resources and Forestry
Ontario Ministry of Natural Resources and Forestry - Aurora/GTA District Office
Ontario Ministry of the Attorney General
Ontario Ministry of Tourism and Health Promotion
Ontario Ministry of Tourism, Culture and Sport
Ontario Ministry of Transportation - Provincial and Environmental Planning Office
Ontario Provincial Police
Ontario Infrastructure and Lands Corporation (OILC)

Utilities

Bell Canada
Enbridge Gas Distribution Inc.
Hydro One Networks Inc.
MTS Allstream
Rogers Communications
Telus
TransCanada Pipelines
Trans-Northern Pipelines Inc.
Veridian Connections
Whitby Hydro
*Please note that as of June 29, 2018, the Ontario Ministries have new names. The Ontario Ministries listed in Table 2 above are listed by their former names.

### 3.4 Community Open House #1

Community Open House (COH) #1 was held on June 29, 2017 from 6:00 p.m. to 8:00 p.m. in the Council Chambers at the Town Municipal Building. The primary objective was to introduce the study, present the need and justification and obtain public input and comments. Sixteen (16) people signed in at COH #1.

A summary of the comments received during the first phase of consultation, along with the corresponding responses and actions developed by the study team are summarized in [Table 3](#) and [Table 4](#).

**Table 3 – COH #1 Comments from the Public**

<table>
<thead>
<tr>
<th>Public Comments</th>
<th>Response/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concerns with safety and congestion on Darren Avenue. The extension of Dryden Boulevard will provide much needed relief on local streets.</td>
<td>The Dryden Boulevard extension will minimize the short cutting that is currently occurring on Darren Avenue.</td>
</tr>
<tr>
<td>Concerns that the Dryden Boulevard extension will increase traffic volume which will impact pedestrian safety near the existing schools and adjacent neighborhoods.</td>
<td>Dryden Boulevard will experience an increase (10-25%) in traffic volume with the road extension, but the level of service is still within the limit for efficient traffic operations. In addition, traffic and congestion should ease on adjacent local streets since the extension will alleviate the short cutting that is currently occurring. The Town will continue to monitor the traffic conditions including pedestrian safety on Dryden Boulevard and adjacent roads after the road extension and implement mitigating measures as needed.</td>
</tr>
<tr>
<td>Reduce the speed limit on Dryden Boulevard and add cycling facilities.</td>
<td>The speed on the Dryden Boulevard extension will be 50km/hr. On-road bike lanes are included in the design as well as a multi-use path on the north side of the extension.</td>
</tr>
<tr>
<td>Public Comments</td>
<td>Response/Action</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Install a multi-use path on the west side of Thickson Road from Rossland Road to Darren Avenue.</td>
<td>Thickson Road is a Regional Road. The Town and Region are currently discussing the construction of a multi-use path on the west side of Thickson Road.</td>
</tr>
<tr>
<td>Concerns that the road extension will destroy wildlife and the environment and will increase traffic and noise in the area.</td>
<td>Through consultations with the Central Lake Ontario Conservation Authority (CLOCA), the proposed bridge will accommodate wildlife passage. The Town will provide compensation in the form of plantings for the loss of vegetation within the Provincially Significant Wetland (PSW) due to the construction of the road and bridge.</td>
</tr>
<tr>
<td>Concerns that the extension will increase traffic and noise in the area.</td>
<td>As part of this EA Study, a noise impact assessment was completed by an experienced Consultant who is an expert in this field. The assessment examines the impacts caused by the increased traffic volume, and recommends mitigating measures based on established noise policies and standards.</td>
</tr>
<tr>
<td>Request to preserve the trees and natural features during construction as much as possible. Protect existing wildlife corridor and potential impacts from stormwater discharge.</td>
<td>The design team is working closely with CLOCA to minimize impacts to existing trees and natural features and provide compensation (trees, plantings, etc.) for any loss of natural features due to construction. The bridge will be designed to allow for the passage of small- to medium-sized wildlife. Stormwater management will be incorporated into the design, such as oil grit separators and plunge pools.</td>
</tr>
<tr>
<td>Add a traffic signal at Deverell Street and Dryden Boulevard.</td>
<td>In order to introduce a new traffic signal in the Town of Whitby, traffic signal warrants must be met, which include a review of 8-hour volume profile, past collisions, wait times, queue lengths, and distance from existing traffic signals. At this time, existing and forecast conditions at the intersection of Deverell Street and Dryden Boulevard do not meet signal warrants. After the extension of Dryden Boulevard, the Town of Whitby will continue to</td>
</tr>
</tbody>
</table>
### Public Comments
<table>
<thead>
<tr>
<th>Agency Comments</th>
<th>Response/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ministry of the Environment, Conservation and Parks (MECP)</strong></td>
<td>Thank you. The requirements will be reviewed and addressed.</td>
</tr>
<tr>
<td>Review “Areas of Interest” document and identify applicable areas and ensure they are addressed. Ensure that the duty to consult is fulfilled. A draft copy of Project File Report should be sent to MECP 30 days prior to filing of final report as well as Notice of Completion and final Project File when completed.</td>
<td></td>
</tr>
<tr>
<td><strong>Ministry of Tourism, Culture and Sport (MTCS)</strong></td>
<td>Thank you. Archaeological Assessment will be performed and documented for this EA. Based on the MTCS criteria, there are no cultural heritage resources within the study area.</td>
</tr>
<tr>
<td>Archaeological Assessment should be undertaken by an archaeologist licensed under the OHA. MTCS “Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes” should be completed to determine whether the project will impact cultural heritage resources. If so, a Heritage Impact Assessment should be completed. Both studies should be addressed and incorporated into EA projects.</td>
<td></td>
</tr>
<tr>
<td><strong>Mississaugas of Scugog Island First Nation</strong></td>
<td>Archaeological Assessment will be sent when completed.</td>
</tr>
<tr>
<td>Expressed interest in Archaeological Assessment when complete.</td>
<td></td>
</tr>
<tr>
<td><strong>Region of Durham</strong></td>
<td>Copies of the meeting minutes and correspondence can be found in Appendix B.</td>
</tr>
<tr>
<td>Did not receive the notice for COH No. 1 but did provide comments at a meeting held with the Region and the Town on November 17, 2017 and subsequent email on March 13, 2018.</td>
<td></td>
</tr>
</tbody>
</table>

A copy of all comments and emails can be found in **Appendix A**.

A copy of all comments and emails can be found in **Appendix B**.
3.5 Community Open House No. 2

COH #2 was held on April 19, 2018 from 6:00 p.m. to 8:00 p.m. in the Council Chambers at the Town of Whitby Municipal Building. The primary objective was to present and obtain comments on the evaluation of alternative solution, project studies and alternative bridge designs. Fifteen (15) people signed in at COH #2.

A summary of the comments received during the second phase of consultation, along with the corresponding responses and actions developed by the study team are summarized in Table 5 and Table 6.

Table 5 – COH #2 Comments from the Public

<table>
<thead>
<tr>
<th>Stakeholder Comments</th>
<th>Response/Action</th>
</tr>
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<tbody>
<tr>
<td>Bridge should be 40m since the water runoff may be expanded.</td>
<td>A hydraulic analysis was completed as part of the study and a 22m span bridge is sufficient to allow the 100 year flow to pass through without affecting neighboring. The Central Lake Ontario Conservation Authority (CLOCA) reviewed the hydraulic analysis and had no concerns (refer to Table 6 below).</td>
</tr>
<tr>
<td>Addition of bike lanes/multi use path seen as positive.</td>
<td>The provision of multi-use path, including the extension to the hydro corridor trail (just west of Puttigedge), will be considered based on usages, operations and budget priorities.</td>
</tr>
<tr>
<td>Extend multi use path west to connect to hydro corridor trail.</td>
<td>The Town will discuss the technical feasibility and financial responsibility of traffic loops for bicycles with the Region of Durham.</td>
</tr>
<tr>
<td>Add traffic loop for bicycles at the Dryden Boulevard/Thickson Road intersection to trigger the traffic signal.</td>
<td>Thank you for your support.</td>
</tr>
<tr>
<td>We support the extension, it will make travel much easier, especially to the schools.</td>
<td>Thank you for your support.</td>
</tr>
<tr>
<td>Connecting Dryden Boulevard from Anderson Street to Thickson Road would offer local traffic an alternate route and relieve some of the congestion on the through roads at peak times.</td>
<td>Thank you for your support.</td>
</tr>
</tbody>
</table>
### Stakeholder Comments

<table>
<thead>
<tr>
<th>Stakeholder Comments</th>
<th>Response/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Dryden Boulevard extension will also reduce the trips through Darren Avenue.</td>
<td></td>
</tr>
<tr>
<td><strong>Concern about damage to wetlands, green space should be preserved. There are many</strong></td>
<td>Through consultations with the Central Lake Ontario Conservation Authority (CLOCA), the proposed bridge will accommodate wildlife passage. The Town will provide compensation in the form of plantings for the loss of vegetation within the Provincially Significant Wetland (PSW) due to the construction of the road and bridge.</td>
</tr>
<tr>
<td><strong>varieties of wildlife using the study area as a corridor.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Concern with air quality and noise with the extension of Dryden Boulevard and past</strong></td>
<td>A noise assessment was completed for the extension of Dryden Boulevard. The final report will be incorporated into the ESR and will be available for public review as part of the Dryden Boulevard Extension Environmental Assessment process.</td>
</tr>
<tr>
<td><strong>widening of Thickson Road.</strong></td>
<td>The air assessment indicated that the proposed extension of Dryden Boulevard will not cause any air pollution standards to be exceeded.</td>
</tr>
<tr>
<td><strong>Concern with the loss of property value due to the extension.</strong></td>
<td>Residents can contact the Town Clerk for concerns regarding loss of property value due to the Town of Whitby’s projects.</td>
</tr>
<tr>
<td><strong>Dryden Boulevard is not suitable for high traffic as a corridor, concern for safety</strong></td>
<td>Dryden Boulevard is classified as an arterial road, on which heavy vehicles cannot be restricted. Speed bumps will negatively impact emergency response time and are a challenge for transit. As such, based on Town’s policies, speed bumps are not supported on Town roads. In addition, speed bumps are not installed on arterial roads.</td>
</tr>
<tr>
<td><strong>on Dryden Boulevard East with increased traffic.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Restrict heavy vehicles.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Speed Bumps suggested for traffic calming measures.</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Stakeholder Comments

<table>
<thead>
<tr>
<th>Stakeholder Comments</th>
<th>Response/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signage and enforced fines to restrict, prevent and/or prohibit oversized commercial vehicular traffic flow between Thickson Road to Anderson, Garden and/or Brock Street.</td>
<td>Heavy vehicles cannot be restricted on arterial roads.</td>
</tr>
<tr>
<td>Concerned with left turn movement from Puttingedge Drive to Dryden Boulevard, how will intersection be controlled?</td>
<td>Puttingedge Drive will continue to be stop-controlled to Dryden Boulevard. Warrant thresholds are not currently satisfied, however, the intersection will continue to be monitored.</td>
</tr>
<tr>
<td>How will dust/dirt during construction be limited?</td>
<td>The contractor will be required to apply dust suppressants and/or water to reduce dust during construction.</td>
</tr>
</tbody>
</table>

A copy of all comments and emails can be found in **Appendix A**.

### Table 6 – COH #2 Comments from Agencies

<table>
<thead>
<tr>
<th>Stakeholder Comments</th>
<th>Response/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLOCA</strong></td>
<td></td>
</tr>
<tr>
<td>Review of Hydraulics and geomorphological assessment has been completed, no further concerns.</td>
<td>Thank you very much.</td>
</tr>
<tr>
<td><strong>Nation Huronne-Wendat</strong></td>
<td></td>
</tr>
<tr>
<td>At this stage of the study, has any archaeological assessment been completed?</td>
<td>Archaeological Assessment will be sent when completed.</td>
</tr>
</tbody>
</table>

The draft Environmental Study Report (ESR) was circulated to the Ministry of the Environment, Conservation and Parks, Central Lake Ontario Conservation Authority, Region of Durham and Minto (Rossland) Development Inc. for their review and comment at the end of July 2018. A copy of their comments and corresponding responses are summarized in **Appendix K**.
3.6 Consultation with First Nations

The First Nations Consultation including contacting representatives from the following communities:

- Alderville First Nation
- Anishinabek Nation/Union of Ontario Indians Nipissing First Nation
- Assembly of First Nations
- Association of Iroquois & Allies Indians
- Beausoleil First Nation
- Chiefs of Ontario
- Chippewas of Georgina Island First Nation
- Chippewas of Rama First Nation
- Curve Lake First Nation
- Hiawatha First Nation
- Iroquois Confederacy
- Kawartha Nishnawbe First Nation
- Metis Nation of Ontario
- Mississaugas of Scugog Island First Nation
- Mississaugas of the New Credit First Nation
- Moose Deer Point First Nation
- Nation Huronne-Wendat
- Saugeen Ojibway Nation
- Williams Treaty First Nations
- Union of Ontario Indians

The study notices were addressed to the representatives. In addition, the provincial and federal agencies related to First Nation affairs were also contacted.

The project team received a response from the following communities expressing interest in the study findings and recommendations, and requested to continue to receive updates:

- Mississaugas of Scugog Island First Nation – This agency requested a copy of the archaeological assessment. The report was forwarded on May 24, 2018 via email.
- Nation Huronne-Wendat This agency requested a copy of the archaeological assessment. The report was forwarded on May 24, 2018 via email.
In May 2018, the Project Team completed another search of the First Nation community websites and emailed the First Nation communities requesting confirmation that they had received the past notices for the Dryden Boulevard EA. Copies of the notices and link to the Town of Whitby’s website were provided in the email. Only Chiefs of Ontario acknowledge receipt.

The project team received a response from the following communities advising that they have no interest in the project or concerns regarding the proposed undertaking, and requesting to be removed from the project contact list:

- To date no community has requested to be removed from the contact list.

Correspondence related to First Nations Consultation is included in Appendix B.

### 3.7 Reporting

The Class EA process is concluded by compiling an Environmental Study report of the decision-making process and supporting documentation (this report) and issuing a Notice of Study Completion. The Notice of Study Completion was mailed directly to all stakeholders on October 4, 2018. A copy of the notice is provided in Appendix A.

This Environmental Study Report is available for public review and comment for thirty (30) calendar days from October 4, 2018 to November 5, 2018. Copies of the report are available for review during normal business hours at the following locations:

- Town of Whitby, Municipal Building, 575 Rossland Road East
- Whitby Central Library, 405 Dundas Street West

### 3.8 Part II Order Request

If a stakeholder has serious concerns about the project, it is their obligation to contact the Town of Whitby to discuss these concerns. If an acceptable resolution cannot be found, a stakeholder may submit a project review request to the Ministry of the Environment, Conservation and Parks. This is called a Part II Order Request, which is so-named because it invokes Part II of the Environmental Assessment Act, allowing the Minister to elevate the project to a higher level of study if warranted.

If a stakeholder wishes to submit a Part II Order Request, a Part II Order Request Form must be used. The Part II Order Request Form is available online on the Ministry’s website (https://www.ontario.ca/page/class-environmental-assessments-part-ii-order) by clicking on “Part II Order Request Form” and the
form must be received by the Ministry within the 30-day comment period following the Notice of Study Completion.

Contact information for the Ministry of the Environment, Conservation and Parks:

Minister of the Environment, Conservation and Parks
Floor 11, 77 Wellesley St W Toronto, ON, M7A 2T5
Fax: 416-314-8452
Minister.mecp@ontario.ca

Director, Environmental Assessment and Permissions Branch
Ministry of the Environment, Conservation and Parks 135 St. Clair Ave West, 1st Floor, Toronto, ON, M4V 1P5
denviropermissions@ontario.ca

Contact information for the Town of Whitby:

Horace Look, P.Eng., Project Engineer (Capital)
Engineering and Infrastructure Services Division
Town of Whitby Public Works
Unit 102, 3050 Garden Street, Whitby, ON, L1R 2G7
Tel: 905-430-4935
lookh@whitby.ca

Office of the Town Clerk
575 Rossland Road East, Whitby, ON, L1N 2M8
Tel: 905-430-4315
Fax: 905-686-7005
4 EXISTING CONDITIONS

This section summarizes the existing conditions including the natural and socio-economic environments.

4.1 Planning

4.1.1 Provincial Policy Statement

The Provincial Policy Statement, 2014 (PPS) provides policy direction on matters of provincial interest related to land use planning and development, and sets the policy foundation for regulating development and use of land in Ontario. It specifically provides guidance on community planning, wise use of resources, and protection of public health and safety. The guidance in the PPS is used by Regional and Local municipalities when developing Official Plans, and relevant policies are incorporated into those documents. Official Plans are the vehicles for implementation of the PPS.

The following objectives set out in Part V: Policies of the PPS are considered applicable to the proposed project:

Part V, Section 1.0 of the PPS – Building Strong Healthy Communities

1.6.8 Transportation and Infrastructure Corridors – This section of the PPS mandates the development, management and protection of corridors for transportation and infrastructure and provides guidance on the concentration of growth to designated settlement areas in order to plan efficient transportation and infrastructure.

Part V, Section 2.0 of the PPS – Wise Use and Management of Resources

2.1 Natural Heritage, 2.2 Water – These sections of the PPS provides a framework for the protection of Natural Heritage features, areas and watercourses in development and site alteration. These policies protect Ontario’s resources for their economic, environmental and social benefits.

These objectives and policies inform the planning and design process for this Class EA study.

4.1.2 The Growth Plan for the Greater Golden Horseshoe

The Growth Plan for the Greater Golden Horseshoe (Growth Plan) was released in May 2017 and came into effect July 1, 2017 as an update to the growth plan released in June 2006. The Region of Durham is identified as the Inner Ring area in the Growth Plan.
The Growth Plan models growth of population and employment in the Greater Golden Horseshoe (GGH) area to a horizon year of 2041 and provides a framework for implementing Ontario’s vision for managing growth in the GGH region.

It is forecasted that the Region of Durham population will grow to 1,190,000 and employment grows to 430,000.

The Growth Plan policies are considered in the development of the planning and design process for this project.

4.1.3 The Greenbelt Plan

The Greenbelt Plan (2017) was released in May 2017 and came into effect on July 1, 2017 as an amendment to the plan first prepared and approved under the Greenbelt Act in 2005. The plan identifies areas where urbanization is restricted in order to protect against the loss of agricultural land base and gives permanent protection to natural heritage and water resource systems.

As shown in Figure 3, the Study Area is within the settlement area (shown in grey) outside of the Greenbelt (green area) and is not designated as protected countryside.
4.1.4 Region of Durham Official Plan

The Durham Region Official Plan establishes the planning framework for the Region that flows down to the member municipalities, including the Town of Whitby. Within the Durham Region Official Plan, the study area is within the ‘Living Areas of the Regional Structure’.

Living Areas are intended to be predominantly for housing purposes, to be comprised of communities defined within local area municipal official plans. The goal of these areas are to provide a wide variety of housing types, support and provide access to public transit, and be based on good urban design principles, including provision of parks and pedestrian facilities.

The Pringle Creek tributary is within the study area is identified under the Region’s OP as a Key Natural Heritage Feature and part of the Region’s Greenland System. The Region requires that development within identified valleylands does not alter the flood capacity of the valley, affect fish and wildlife habitats, woodlands or the
character of the stream. Consequently, it must be demonstrated that project will not result in an overall negative impact to the functions and features of the Natural Heritage System.

4.1.5 Town of Whitby Official Plan (2010)

The Town of Whitby Official Plan (OP) prescribes policy directions for land use planning within the Town with a focus on long term growth and development.

The study area is a developed area which is predominantly residential with supplemental institutional and commercial land uses. Within the larger study area, there are two schools within 500m of the Dryden Boulevard extension. The study area is designated as Residential and Hazards Lands. Hazard Lands in the context of the OP indicates areas where natural hazards exist, such as floodplains or steep slopes.

The Pringle Creek corridor, identified as Hazard Land, is also designated as Provincially Significant Wetland (PSW) which are lands designated by the Ontario Wetland Evaluation System (OWES) as being most valuable. As noted in Section 5.3.3.1 of the Town’s OP, the Town requires that development be consistent with the goals of the Wetlands Policy Statement prepared by the Province under Section 3 of the Planning Act which is intended to:

- Ensure that wetlands are identified and adequately protected through the land use planning process; and
- Achieve no loss of contiguous area or function of Provincially Significant Wetlands

The Town of Whitby 2010 Official Plan indicates that Dryden Boulevard is planned to be a Type C arterial road, continuous between Anderson Street and Thickson Road. This is confirmed in Amendment 105 to the Whitby Official Plan adopted on February 2018.

Amendment #107 to the Town’s Official Plan deleted a proposed Collector Road (extension of Glen Dhu Drive) and added a Collector Road to connect the existing and proposed development to the future Dryden Boulevard via Lofthouse Street. Amendment #107 is shown schematically in Figure 4 below.

The amendment was based on an application submitted by Minto Rossland Inc. to permit a proposed plan of subdivision further discussed in Section 4.1.8. The amendment will avoid an additional creek crossing and the additional traffic volumes from the proposed development can be accommodated by the existing collector roads and the proposed new local roads. The extension of Lofthouse Drive will provide connection to the existing collector road network to an arterial road.
Figure 4 – Amendment 107 to the Whitby Official Plan

Exhibit ‘A’ to Official Plan Amendment # 107
to the Whitby Official Plan

Add ‘Collector Road’
Delete ‘Collector Road’

Transportation
Official Plan
Town of Whitby

Legend:
- Existing Controled Access Highway (Trunkway)
- Proposed Controled Access Highway (Trunkway)
- Type A Arterial Road (30m-60m RCV)
- Type B Arterial Road (24m-30m RCV)
- Type C Arterial Road (18m-24m RCV)
- Local Road (12m-18m RCV)
- Unplanned Road Network
- Intersection Improvement
- Proposed Grade Separation
- Proposed Grade Separation
- Regional Road
- Provincial Highway
- Municipal Boundary
4.1.6 Town of Whitby Transportation Master Plan (June 2010)

The Town of Whitby Transportation Master Plan (TMP) Study was completed to identify and detail an integrated and diversified transportation framework that supports long term growth in the Town by providing for the efficient movement of people and goods within and through the Town.

Dryden Boulevard is designated as a Type C Arterial.

The Town of Whitby TMP has identified opportunities to create continuous east-west streets, including the missing links along Dryden Boulevard between Anderson Street and Thickson Road.

The timing of the extension is anticipated to coincide with development in the area, refer to Section 4.1.8 for more information on the proposed Minto development. It is noted in the TMP that the Town of Whitby will collaborate with the Region of Durham to provide intersection upgrades at Thickson Road at the extension.

The completion of the missing link would improve overall connectivity in the network, support future development, overall transit routing structure, and allow direct and continuous cycling routes.

4.1.7 Town of Whitby Cycling and Leisure Trails Plan (June 2010)

The Town of Whitby Cycling and Leisure Trails Plan is a high level strategic plan that provides recommendations on facilitating connectivity in the town through cycling and leisure trails. The ongoing Town of Whitby Active Transportation Plan which is currently released in draft form will update the 2010 plan.

The Town of Whitby has proposed an on-road bikeway along Dryden Boulevard from Civic Centre Drive to just east of Garrard Road (Town limit). The Draft Active Transportation Plan confirms that there is a planned bike lane on Dryden Boulevard from Deverell Street to Thickson Road, however it transitions from on-road to an in-boulevard path from Thickson Road to beyond Garrard Road. Neither the Cycling and Leisure Trails Plan nor the Town of Whitby Active Transportation plan include a multi-use path on Thickson Road. Figure 5 below includes an extract of the recommended network in the location of the study area.
Figure 5 – Recommended Cycling and Leisure Trails Network
4.1.8 Proposed Development

A draft plan of subdivision (File SW-2016-02” –Ivy Ridge Minto Development Inc.) is proposed north and south of the Dryden Boulevard extension to the west of Pringle Creek. The development consists of townhomes and single detached homes from Rossland Road and Thickson Road to just north of the new Dryden Boulevard extension.
4.2 Archaeological Assessment

Archaeological Assessment Stages 1 to 4 were conducted as part of the 2016 development project that bisects the study area.

These studies encompass the study area and the following features were identified:

- A 60m by 40m mid-19th (1830-1840s) century historical Euro-Canadian archaeological site with over 200 surface artifacts. This site was named the Anderson site and given the frequency of recovered artifacts, a Stage 3 assessment was recommended.

- A total of 38 19th century historical artifacts (1783) were recovered during the Stage 3. Given the identified date range, the site was determined to have potential cultural heritage value or interest, therefore a Stage 4 assessment was recommended.

- In the last stage of the assessment, six cultural features, including a root cellar, refuse pit, ash pit, and three post moulds, were recovered.

The archaeological reports have been reviewed and accepted by the Ministry of Tourism, Culture and Sports (MTCS). No further archaeological assessments are required for the Dryden Boulevard extension EA.

A copy of the report is found in Appendix C.
4.3 Cultural and Heritage Assessment

The cultural heritage screening for the Dryden Boulevard EA determined that there are no cultural heritage resources within the study limits. As a result, no further cultural heritage studies or mitigation measures are required. A copy of the report is found in Appendix D.

4.4 Natural Environment

The Study area includes land designated under the Town’s Official Plan as Residential and Hazard Lands. Pringle Creek runs through the study area and is identified as Hazard Lands and a Provincially Significant Wetland (PSW) by the Ministry of Natural Resources and Forestry (MNRF). As shown in Figure 7, a
portion of the Whitby-Oshawa Iroquois Beach PSW 52 is located in the study area along the tributary of Pringle Creek.

Figure 7 – Natural Environment Features

A summary of existing natural environment features was obtained from publicly available background information sources through the MNRF and CLOCA. A field survey was undertaken on June 1, 2017 by qualified biologists. The following
summarizes the key findings during the Natural Environment report. A copy of the Natural Environment report is included in Appendix E.

4.4.1 Species at Risk and ANSIs

Species with the Species at Risk (SAR) designation are protected under the Species at Risk Act. Information received from MNRF identified 11 SAR with potential to occur in the study area. Given that the available habitat in the study area has limited diversity and is generally disturbed, SAR are unlikely to rely on these habitats to support any critical life processes.

There are no Areas of Natural and Scientific Interest (ANSIs) within the study area.

4.4.2 Vegetation and Terrestrial Habitat

The study area consists of an agricultural field bisected by the Pringle Creek valleyland corridor, which contains predominantly wetland communities and smaller pockets of forest. Vegetation within the study area includes native and non-native species exclusively occurring in the PSW and Pringle Creek valleyland. The majority of the native plant species identified through the vegetation surveys are secure and common in Ontario.

There were no SAR plants identified during the field surveys. The study area does not contain significant woodlands.

No rare plant communities were identified in the study area during the field survey. Therefore, no impacts as a result of project activities are anticipated and no mitigation is required.

4.4.3 Wildlife and Wildlife Habitat

Wildlife habitat in the study area has limited diversity and is generally disturbed and fragmented due to the close proximity to urban development. However, the Pringle Creek valleyland and creek corridor likely provide a movement corridor for wildlife.

Small mammals, such as toads, use the creek valley. Bridges are to include provisions for wildlife passage with an openness ratio of 0.2 to accommodate small to medium mammals.

Barn swallows, which are designated as threatened under the Endangered Species Act, are the only species identified with moderate potential to occur within the study area.
There is no suitable habitat in the study area for any Species of Conservation Concern (SOCC) that were identified as having ranges which overlap the study area. Therefore, no impacts to SOCC habitat.

4.4.4 Fish Habitat

Pringle Creek is identified as a cold water watercourse, however, the assessed portion of the creek within the study area revealed a lack of direct fish habitat potential. The assessed reaches within the study area are limited by fish migration barriers from the main Pringle Creek, over a distance of approximately 1.5km. The absence of a defined channel combined with extensive vegetation growth does not support fish passage through the study area under most seasonal conditions.

4.5 Geomorphology

Surficial geology, modern alluvial deposits (clay, silt, sand and gravel) are found along the full length of Pringle Creek within the study area. The low-gradient, low-relief nature of the physiographic region provides an environment conducive to the formation of a wetland.

The Dryden Boulevard extension would cross Reach 3 as noted in the Geomorphological Investigation included in Appendix F. Reach 3 is a marsh with mostly wetland vegetation (cattails, phragmites and reed canary grass) and a few trees. The wetland vegetation is very dense and provides significant resistance to flow. The Rapid Geomorphic Assessment (RGA) is not applicable for Reach 3 since this is a wetland reach and RGA only applies to reaches what have a well-defined, alluvial channel.

Stormwater runoff from the proposed road should be directed to a pool at the discharge location with a level spreader around its perimeter.

4.6 Source Water Protection

The Clean Water Act was established in 2006 to enhance protection of Ontario’s municipal drinking water resources. The Act focuses on protecting water before it enters municipal drinking water treatment systems. To achieve this, 19 Source Protection Regions were established in the province, each with a Source Water Protection Plan that identifies vulnerable areas and recommends mitigation measures to reduce threats to drinking water.

The Dryden Boulevard extension study area is within the CTC Source Protection Region. The acronym CTC stands for the following Conservation Authority partners: Credit Valley Conservation Authority, Toronto and Region Conversation Authority.
Authority, and Central Lake Ontario Conservation Authority. Within the Source Water Protection Regions, Intake Protection Zones (IPZs) are identified as areas around surface water intake, which are the most vulnerable areas that potential contaminants could infiltrate the water supply. These zones are taken into consideration in during land use planning processes and also provides guidance in the event of a spill within an IPZ.

The CTC Source Protection Region mapping was reviewed, the study area was not identified to be within an IPZ.

The Study area is not located within a Significant Groundwater Recharge Area.

The Study area has a low aquifer vulnerability index and is not located within a highly vulnerable aquifer with vulnerability scoring of 6 according to the mapping included in Approved Updated Assessment Report Central Lake Ontario Source Protection Area.

4.7 Groundwater

A search of the Ministry of the Environment, Conservation and Parks website revealed a few wells in the study area, refer to Figure 8 below.
A search of the well record on the MECP website revealed that some of the wells are decommissioned or are being used for monitoring. Since the area is serviced with municipal water, the wells in the area are not likely in use. During detailed design, a hydrogeological assessment will be required which will assess whether the wells are active and will predict the impact that construction dewatering may have on the wells.

A review of the past geotechnical reports in the area revealed that the groundwater level is 0.8m below existing ground (elev. 117.6) in monitoring wells near the Pringle Creek. A geotechnical investigation will be completed during detailed design.

Excavation below the water table are expected to require dewatering during construction. If short-term pumping of groundwater at volumes greater than 50,000 L/day and less than 400,000L/day is required during the construction stage, then an Environmental Activity Sector Registry (EASR) will be required. If water taking
in excess of 400,000 L/day is required, then a Permit to Take Water (PTTW) will be required prior to construction dewatering.
5 NEEDS AND ASSESSMENT

The Town of Whitby Transportation Master Plan (TMP) identifies a lack of a continuous east-west mid-block arterial in east Whitby. Dryden Boulevard is a Type C arterial road which extends from Brock Street to Deverell Street and from Thickson Road to Thornton Road in the City of Oshawa. The TMP recommends that potential future construction of the missing ‘Dryden link’ between Deverell Street and Thickson Road be protected for.

Dryden Boulevard is a 3-lane cross-section, within a 30.0 metre right-of-way, with space provided for future bike lanes from Anderson Street to Deverell Street. Dryden Boulevard from Thickson Road to Deer Valley Drive in Oshawa is a 4-lane urbanized cross-section, within a 30.0 metre right-of-way.

The Dryden Boulevard Transportation Assessment (2017) was completed by Dillon Consulting Ltd.

A calibrated model of the study area was created based on Durham Region’s Travel Demand Model, with refinements made using screenline analysis.

Existing and future conditions in 2015 and 2041 respectively were assessed to identify deficiencies and investigate opportunities to alleviate congestion and improve the level of service in the study area. Specifically, the study examined the effects of an extension of Dryden Boulevard to Thickson Road.

Level of Service (LOS) based on volume-to-capacity (V/C) analysis was performed for road networks within the study to provide a baseline. Table 7 below shows the corresponding LOS and V/C for each strategic category.

Table 7 – Level of Service

<table>
<thead>
<tr>
<th>Strategic Category</th>
<th>LOS Range</th>
<th>V/C Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Level of Service</td>
<td>LOS A-D</td>
<td>0.00-0.85</td>
</tr>
<tr>
<td>Approaching Capacity</td>
<td>LOS E</td>
<td>0.86-1.00</td>
</tr>
<tr>
<td>Over Capacity</td>
<td>LOS F</td>
<td>&gt;1.00</td>
</tr>
</tbody>
</table>

5.1 Existing Conditions

The PM peak hour (afternoon rush hour) was identified as the critical time period that represents the peak demand on the road network and is used to represent the worst-case conditions. Rossland Road and Taunton Road are both approaching capacity at Thickson Road.
Within the study area, Darren Avenue is the only collector east-west roadway connecting Thickson Road with Anderson Street. Darren Avenue is located between these two arterials. Being the only alternative to the east-west arterials of Taunton Road and Rossland Road, although Darren Avenue is a collector road, it is currently functioning as a busier-than-intended east-west route. This has raised speeding and safety concerns with residents that live on or adjacent to Darren Avenue.

The Transportation Needs Assessment considered the area bounded by Taunton Road, Brock Street, Rossland Road in Whitby and Thornton Road in Oshawa. The existing condition’s level of service based on volume-to-capacity analysis is summarized in Figure 9.

**Figure 9 – Existing Conditions (2015 PM Peak Hour)**

During afternoon rush hour, both Taunton Road & Rossland Road in the eastbound direction are currently approaching capacity.

- Eastbound Taunton Road at Thickson Road is at 88% Capacity
- Eastbound Rossland Road at Thickson Road is at 92% Capacity
5.2 Future Conditions

Two alternatives were considered to address the growing congestion due to the lack of east-west capacity and have been analyzed under the future network conditions in 2041 for the PM Peak Hour condition:

- The future base network with prior planned localized improvements, and;
- The future base network with above, plus the completion of the new Dryden Boulevard extension.

5.2.1 Future Base Network

The future base network would be the condition of the study area in 2041 without the connection of Dryden Boulevard but includes network improvements already planned in the area, growing network demands and land uses.

The proposed network improvements include the widening of Brock Street from two to four lanes through the study area.

Figure 10 shows the increased demands along the parallel arterials of Taunton Road and Rossland Road. The intersection of Taunton Road at Thickson Road is expected to be very near capacity and the intersection of Rossland Road at Thickson Road effectively at capacity.
Results:

- Eastbound Taunton Road at Thickson Road will be at 98% Capacity
- Eastbound Rossland Road at Thickson Road will be at 101% Capacity

As a result, there is expected to be an even higher usage of Darren Avenue as an arterial bypass route than is currently the case, further exacerbating existing concerns about excessively-high traffic volumes and speeding along this roadway.

### 5.2.2 Improved Future Network

The future base network without the Dryden Boulevard extension is compared to the improved future network with the completion of the new Dryden Boulevard extension.

**Figure 11** shows the future improved network in the PM Peak Hour. The addition of the extension significantly improves the screenline capacity across Thickson Road. The east-west demand is distributed more evenly across Taunton Road, Dryden Boulevard and Rossland Road, which improves level of service at both Taunton Road and Rossland Road.
Results:

- Eastbound Taunton Road at Thickson Road will be at 85% Capacity
- Eastbound Dryden Boulevard at Thickson Road will be at 77% Capacity
- Eastbound Rossland Road at Thickson Road will be at 87% Capacity

5.3 Problem / Opportunity Statement

Dryden Boulevard currently terminates just east of Deverell Street and at Thickson Road in Whitby. Based on the Transportation Needs Assessment, other east-west roads such as Taunton Road & Rossland Road will approach or exceed their capacity. Being one of the key arterial roads in the area to support local mobility and access, the completion of this missing link along Dryden Boulevard will provide the following benefits:

- Mitigate potential capacity issues on adjacent eastbound and westbound roads
- Improve connectivity between adjacent neighbourhoods
- Support active transportation (i.e. bike lanes, multi-use paths, etc.)
- Reduce local trip lengths
- Provide safe operating environment for pedestrians
- Reduce short cutting along Darren Avenue
- Improve transit ridership by connecting the neighborhood to transit services on Thickson Road
- Support future developments

A copy of the Transportation Assessment Report is included in Appendix H.
6 ALTERNATIVE SOLUTIONS

Several alternative solutions were identified and assessed to determine feasibility their potential to improve traffic flow in the region and reduce congestion.

6.1 Alternative Solutions

The alternatives solutions include the following:

Alternative 1 - Do Nothing
No Changes made within the study area. In accordance with the MEA document, “Do nothing” must be considered as a baseline solution.

Alternative 2 - Transportation Demand Management (TDM) Initiatives
Introduce TDM strategies to reduce demands (i.e. shift demands on to time periods outside of the congestion periods and promote alternative modes of transportation, such as transit, cycling, walking).

Alternative 3 - Improve Surrounding Road Network
Upgrade adjacent / parallel roadways to reduce the travel demands and increase capacity in the east-west corridors Additional lanes could be provided on Regional Road such as Rossland Road and Taunton Road.

Alternative 4 - Extension of Dryden Boulevard
Extend Dryden Boulevard from Deverell Street to Thickson Road on the east.

6.2 Evaluation Criteria

The alternative solutions were evaluated based on the following criteria outlined in Table 8.

Table 8 – Alternative Solution Evaluation Criteria

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Sub-Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation</td>
<td>• Long-term vehicular demand</td>
</tr>
<tr>
<td></td>
<td>• Town of Whitby Transportation Master Plan</td>
</tr>
<tr>
<td></td>
<td>• Safety</td>
</tr>
<tr>
<td></td>
<td>• Pedestrian / Cyclist Access</td>
</tr>
<tr>
<td></td>
<td>• Response time of Emergency vehicles</td>
</tr>
<tr>
<td>Evaluation Criteria</td>
<td>Sub-Factors</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Land-use Planning</td>
<td>• Town of Whitby Official Plan</td>
</tr>
<tr>
<td></td>
<td>• Town of Whitby Cycling and Leisure Trails Plans</td>
</tr>
<tr>
<td></td>
<td>• Future development opportunities</td>
</tr>
<tr>
<td>Natural Environment</td>
<td>• Watercourse / fisheries</td>
</tr>
<tr>
<td></td>
<td>• Effects to Provincially Significant Wetland (PSW)</td>
</tr>
<tr>
<td></td>
<td>• Effects to wildlife and linkage</td>
</tr>
<tr>
<td>Social Environment</td>
<td>• Noise</td>
</tr>
<tr>
<td></td>
<td>• Air Quality</td>
</tr>
<tr>
<td>Cultural Environment</td>
<td>• Built heritage and cultural heritage landscape</td>
</tr>
<tr>
<td></td>
<td>• Archaeological resources</td>
</tr>
<tr>
<td>Climate Change</td>
<td>• Climate change impacts</td>
</tr>
<tr>
<td>Economic Environment</td>
<td>• Capital and maintenance costs</td>
</tr>
</tbody>
</table>

In addition to the natural and social economic environment studies outlined in Section 4.0 and the Transportation Assessment in Section 5.0, an Air Quality Assessment and Noise Impact Study were undertaken to review existing conditions and the effects of the Dryden Boulevard extension. A summary of these studies are included in Sections 6.4 and 6.5.

### 6.3 Evaluation of Alternative Solutions

The four alternative solutions were evaluated using the evaluation criteria in Table 8 and the detailed assessment is included in Table 9.

**Table 9 – Evaluation of Alternative Solutions**
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation</td>
<td>Don’t build road extension</td>
<td>Introduce TDM strategies to reduce demands</td>
<td>Upgrade adjacent/parallel roadways</td>
<td>Completion of the Dryden Blvd. connection will provide east-west capacity and ease congestion on adjacent roads.</td>
</tr>
<tr>
<td>Potential to accommodate long-term vehicular demand.</td>
<td>This alternative does not address the growing traffic volumes.</td>
<td>Although there may be small decreased in overall demand, long-term vehicular demands on the surrounding road network will not be accommodated.</td>
<td>Long-term vehicular demands will be eased but significant detours will still be required for local road traffic.</td>
<td></td>
</tr>
<tr>
<td>Potential to be consistent with the Transportation Master Plan.</td>
<td>Inconsistent with the Town of Whitby Transportation Master Plan to extend Dryden Blvd. from east of Anderson St. to Thickson Rd.</td>
<td>Inconsistent with the Town of Whitby Transportation Master Plan to extend Dryden Blvd. from east of Anderson St. to Thickson Rd.</td>
<td>Inconsistent with the Town of Whitby Transportation Master Plan to extend Dryden Blvd. from east of Anderson St. to Thickson Rd.</td>
<td>Consistent with the Town of Whitby Transportation Master Plan to extend Dryden Blvd. from east of Anderson St. to Thickson Rd.</td>
</tr>
<tr>
<td>Potential to improve travel safety.</td>
<td>Safety concerns due to short cutting through Darren Ave. are not addressed.</td>
<td>Safety concerns due to short cutting through Darren Ave. are not addressed.</td>
<td>Safety concerns due to shot cutting through Darren Ave. are not addressed.</td>
<td>Detouring through surrounding local roads is discouraged because of the completed east-west corridor.</td>
</tr>
<tr>
<td>Potential to improve pedestrian / cyclist access</td>
<td>No continuous pedestrian or cycling facility along Dryden Blvd. to Thickson Rd.</td>
<td>No continuous pedestrian or cycling facility along Dryden Blvd. to Thickson Rd.</td>
<td>No continuous pedestrian or cycling facility along Dryden Blvd. to Thickson Rd.</td>
<td>Allows for continuous pedestrian and cycling facility along Dryden Blvd. from Brock St. to Thornton Rd.</td>
</tr>
<tr>
<td>Potential effect on response times of emergency vehicles.</td>
<td>Potential for slower emergency response time as traffic congestion increases.</td>
<td>Potential for slower emergency response time as traffic congestion increases.</td>
<td>Faster emergency response time due to less congestion in surrounding area, but lack of local connections may still slow emergency response time.</td>
<td>Faster emergency response time due to less congestion and the presence of an additional link between neighborhoods.</td>
</tr>
<tr>
<td>Land Use Planning</td>
<td>Least Preferred</td>
<td>Least Preferred</td>
<td>Moderate</td>
<td>Most Preferred</td>
</tr>
<tr>
<td>Compatibility with Town of Whitby future land use plans and objectives (i.e. Official Plan).</td>
<td>Incompatible with future land use plans and objectives for the area. Dryden Blvd. extension is required to service lands on the northwest corner of Rossland Rd. and Thickson Rd.</td>
<td>Incompatible with future land use plans and objectives for the area. Dryden Blvd. extension is required to service lands on the northwest corner of Rossland Rd. and Thickson Rd.</td>
<td>Incompatible with future land use plans and objectives for the area. Dryden Blvd. extension is required to service lands on the northwest corner of Rossland Rd. and Thickson Rd.</td>
<td>Compatible with future land use plans and objectives for the area.</td>
</tr>
<tr>
<td>Future development opportunities</td>
<td>Limits development opportunities in the study area.</td>
<td>Limits development opportunities in the study area.</td>
<td>Limits development opportunities in the study area.</td>
<td>Provides opportunity for development north and south of the extension.</td>
</tr>
<tr>
<td>Natural Environment</td>
<td>Least Preferred</td>
<td>Least Preferred</td>
<td>Least Preferred</td>
<td>Most Preferred</td>
</tr>
<tr>
<td>Potential effects to watercourse/fisheries.</td>
<td>Lowest potential to negatively impact watercourse/fisheries.</td>
<td>Lowest potential to negatively impact watercourse/fisheries.</td>
<td>There will be some impacts to the natural environment such as noise and dust during construction of adjacent/parallel roadways.</td>
<td>The extension of Dryden Blvd. will cross Pringle Creek. Pringle Creek does not have a defined channel through the marsh at the location of the crossing. Therefore, there is an opportunity to incorporate a more defined channel with proper erosion protections as part of the new construction. In water works to be restricted to July 1 to Sept 30 to minimize impact on existing fish habitat.</td>
</tr>
<tr>
<td>Potential effects to Provincially Significant Wetland (PSW).</td>
<td>No impact on the PSW.</td>
<td>No impact on the PSW.</td>
<td>No impact on the PSW.</td>
<td>Potential impact to the PSW will be mitigated by providing additional compensation to account for loss of PSW due to road and bridge footprint.</td>
</tr>
<tr>
<td>Potential effect to wildlife and linkages.</td>
<td>Lowest potential to negatively impact wildlife and linkages.</td>
<td>Low potential to negatively impact wildlife and linkages.</td>
<td>Low potential to negatively impact wildlife and linkages.</td>
<td>Potential impact on wildlife linkages will be mitigated by providing wildlife passages under the new bridge.</td>
</tr>
</tbody>
</table>
### Evaluation Criteria

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Environment</td>
<td>Don’t build road extension</td>
<td>Introduce TDM strategies to reduce demands</td>
<td>Upgrade adjacent/parallel roadways</td>
<td>Noise level will increase due to the road extension. There will be some impacts such as noise and dust during construction. Durham Region Noise Policy will be adopted and future noise levels beyond targets will require noise mitigation.</td>
</tr>
<tr>
<td>Potential noise impacts</td>
<td>Existing noise impacts along Dryden Blvd. to remain status quo.</td>
<td>Existing noise impacts along Dryden Blvd. to remain status quo.</td>
<td>Existing noise impacts along Dryden Blvd. to remain status quo.</td>
<td>Noise level will increase due to the road extension. There will be some impacts such as noise and dust during construction. Durham Region Noise Policy will be adopted and future noise levels beyond targets will require noise mitigation.</td>
</tr>
<tr>
<td>Air Quality Impacts</td>
<td>No change in air quality.</td>
<td>Air quality could potentially be improved.</td>
<td>No changes in air quality in the Dryden Blvd. area but other areas could experience an increase.</td>
<td>Slight increase in air contaminant levels but concentrations do not exceed the acceptable standards or criteria.</td>
</tr>
<tr>
<td>Cultural Environment</td>
<td>No cultural heritage resources found. Therefore, there is no potential to disrupt heritage resources.</td>
<td>No cultural heritage resources found. Therefore, there is no potential to disrupt heritage resources.</td>
<td>No cultural heritage resources found. Therefore, there is no potential to disrupt heritage resources.</td>
<td>No cultural heritage resources found. Therefore, there is no potential to disrupt heritage resources.</td>
</tr>
<tr>
<td>Potential to disrupt archaeological resources within the study area.</td>
<td>No impact to archaeological resources.</td>
<td>No impact to archaeological resources.</td>
<td>No impact to archaeological resources.</td>
<td>No impact to archaeological resources.</td>
</tr>
<tr>
<td>Climate Change</td>
<td>No opportunity to implement measures to reduce climate change.</td>
<td>Opportunity to include active transportation features thus enhancing connectivity across Whitby. However, the long-term vehicular demands on the surrounding road network will not be accommodated and traffic congestion will likely increase.</td>
<td>Opportunity to include active transportation features thus enhancing connectivity across Whitby and encouraging users to choose active transportation rather than cars.</td>
<td>Opportunity to include active transportation features thus enhancing connectivity across Whitby and encouraging users to choose active transportation rather than cars.</td>
</tr>
<tr>
<td>Potential adaptations to climate change</td>
<td>Low flexibility to incorporate climate change adaptation measures.</td>
<td>Low flexibility to incorporate climate change adaptation measures.</td>
<td>Medium flexibility to incorporate climate change adaptation measures in design since existing roads may have some restrictions to the degree of adaptation due to existing conditions.</td>
<td>High flexibility to incorporate climate change adaptation measures in design since the extension is a new road.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>Most Preferred</td>
<td>Less Preferred</td>
<td>Least Preferred</td>
<td>Least Preferred</td>
</tr>
</tbody>
</table>

Based on the above evaluation, Alternative 4, the extension of Dryden Boulevard is recommended to be carried forward for further evaluation.
6.4 Air Quality Assessment

The study team has completed an Air Quality Assessment to examine the impact of the preferred solution (Alternative 4 – Extension of Dryden Boulevard) to air quality. The background air contaminants concentrations (existing conditions) were estimated using air quality data collected by the Ministry of the Environment, Conservation and Parks (MECP).

The study involved computer simulation techniques to predict future vehicle emissions and the resulting concentration of pollutants due to traffic.

The computer simulation included two scenarios, “No-Build” and to “Build” the Dryden Boulevard extension. The simulation was set up to predict air pollutant concentrations at selected impact locations, referred to as receptors. As shown in Figure 12, the receptors were placed with approximately 80m spacing along each side of Dryden Boulevard, to represent operable windows and outdoor amenity areas at residential properties.

Contaminants examined in this study include Respirable Particulate Matter (PM$_{2.5}$), Nitrogen Dioxide (NO$_2$) and Acrolein (C$_3$H$_4$O). These contaminants commonly occur from vehicle emissions and are used in similar air quality studies for Ontario roadway Environmental Assessments. The predicted concentrations from the
computer simulation for this project will be compared against the acceptable thresholds for these contaminants.

**Air Quality Assessment Results:**

The following table compares the predicted maximum cumulative concentrations for the “No Build” versus the “Build” scenarios in the year 2028.

Figure 13 – Comparison of Maximum Predicted Concentrations (ug/m3) for the No-Build and Build Scenarios

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Averaging Period</th>
<th>Background Concentration</th>
<th>Combined Concentration No-Build</th>
<th>Combined Concentration Build</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respirable Particulate Matter (PM2.5)</td>
<td>24 hr</td>
<td>13.8</td>
<td>16.1</td>
<td>17.2</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>6.7</td>
<td>7.4</td>
<td>7.8</td>
<td>8.8</td>
</tr>
<tr>
<td>Nitrous Oxide (NO2)</td>
<td>1 hr</td>
<td>26.5</td>
<td>93</td>
<td>128</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>24 hr</td>
<td>26.5</td>
<td>44.9</td>
<td>54.2</td>
<td>200</td>
</tr>
<tr>
<td>Acrolein</td>
<td>1 hr</td>
<td>0.75</td>
<td>0.78</td>
<td>0.80</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>24 hr</td>
<td>0.30</td>
<td>0.31</td>
<td>0.31</td>
<td>0.4</td>
</tr>
</tbody>
</table>

The proposed project is expected to increase local air contaminant levels, but the maximum predicted cumulative concentrations for all contaminants is within applicable standards. The pollutant closes to is respective limit was fine particulate matter PM2.5 but still within acceptable limits. Therefore, it is expected that the proposed project will not cause any standards or criteria to be exceeded.

The Air Quality Assessment is included in Appendix I.

### 6.5 Noise Impact Study

#### 6.5.1 Noise Assessment Overview

Golder Associates conducted an environmental noise impact assessment for the preferred solution, Alternative 4 – Extension of Dryden Boulevard. The purpose of the study was to:
- Predict existing and future noise levels considering the Dryden Boulevard extension.
- Use the predictions to assess potential impacts.
- Specify mitigation measures, based on the Region of Durham Noise Policy where required, and predict sound levels with mitigation in place.

6.5.2 Methodology and Assessment Criteria

The area of investigation for the Noise Impact Study is defined along Dryden Boulevard between Anderson Street and Thickson Road. A field study was undertaken in March 2018 to identify the existing acoustic barriers of residential properties with backyards that abut Dryden Boulevard.

The Region of Durham Noise Policy was the primary guidance document applied to the Noise Impact Study. The Region’s Noise Policy evaluates the impact of a project based on a target level, as well as a change in sound level. Mitigation measures should be considered when:

- Any future noise level > 60 dBA, or
- Any future noise level > 55 dBA with an increase of ≥ 5dB.

Future proposed mitigation must provide a minimum of 6dB attenuation.

Additional guidance was taken from the Ontario Ministry of Transportation's Environmental Guide for Noise.

Assessments were completed at Outdoor Living Areas (OLAs) located in the backyards of Noise Sensitive Areas (NSAs) that were directly adjacent to and exposed to Dryden Boulevard. OLA is defined as part of an outdoor area on a privately owned residential property easily accessible from the residential dwelling and design for the quiet enjoyment of the outdoor environment.

As shown in Figure 15, nine representative NSAs and associated OLAs were identified with the Area of Investigation.

Noise predictions were undertaken for two time frames:

- Existing (2018)
- Future (2041)

6.5.3 Results

The potential noise impact results at the identified representative OLAs are summarized in Figure 14.
Figure 14 – Noise Assessment Results

<table>
<thead>
<tr>
<th>Receptor Location</th>
<th>Existing Noise Levels (dBA)</th>
<th>Future Noise Levels (dBA)</th>
<th>Change (Future – Existing)</th>
<th>Proposed Acoustic Barrier</th>
<th>Mitigated Future Noise Levels (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLA01</td>
<td>44</td>
<td>50</td>
<td>6</td>
<td>N</td>
<td>—</td>
</tr>
<tr>
<td>OLA02</td>
<td>52</td>
<td>57</td>
<td>5</td>
<td>Y</td>
<td>51</td>
</tr>
<tr>
<td>OLA03</td>
<td>43</td>
<td>49</td>
<td>6</td>
<td>N</td>
<td>—</td>
</tr>
<tr>
<td>OLA04</td>
<td>49</td>
<td>56</td>
<td>7</td>
<td>Y</td>
<td>50</td>
</tr>
<tr>
<td>OLA05</td>
<td>44</td>
<td>51</td>
<td>7</td>
<td>N</td>
<td>—</td>
</tr>
<tr>
<td>OLA06</td>
<td>48</td>
<td>55</td>
<td>7</td>
<td>N</td>
<td>—</td>
</tr>
<tr>
<td>OLA07</td>
<td>—</td>
<td>53</td>
<td>—</td>
<td>N</td>
<td>—</td>
</tr>
<tr>
<td>OLA08</td>
<td>—</td>
<td>53</td>
<td>—</td>
<td>N</td>
<td>—</td>
</tr>
<tr>
<td>OLA09</td>
<td>—</td>
<td>52</td>
<td>—</td>
<td>N</td>
<td>—</td>
</tr>
</tbody>
</table>

Bold green values indicate an exceedance of the Durham Region Noise Policy. Further consideration of mitigation measures are required at these Outdoor Living Areas (OLAs).

OLA07, OLA08, and OLA09 are associated with a future development that includes proposed acoustic barriers.

As shown in Figure 15, a 2.3m high noise barrier is recommended along the existing fence line from OLA02 to OLA04. The expected attenuation provided by the proposed acoustic barrier is 6dB which meets the Town’s requirements. The Town will need to further investigate the feasibility of the noise mitigation presented in the Noise Impact Study based on the other technical aspects (i.e. structural, geotechnical, etc.) and the consideration of economic and administrative factors.

The Noise Impact Study is included in Appendix J.
Figure 15 – Representative OLAs and Proposed Barrier Layout

LEGEND
- REPRESENTATIVE OUTDOOR LIVING AREAS
- PROJECT SITE
- AREA OF INVESTIGATION
- ROADS
- REPRESENTATIVE NOISE SENSITIVE AREAS
  - EXISTING
  - FUTURE DEVELOPMENT
- ACOUSTIC BARRIERS
  - EXISTING
  - FUTURE DEVELOPMENT
  - PROPOSED
As noted in evaluation of the alternative solutions included in Table 9, the preferred alternative solution to extension of Dryden Boulevard was recommended to be carried forward for further evaluation. There are two main components to the Dryden Boulevard extension, the road and the bridge crossing Pringle Creek.

7.1 Alternative Designs

7.1.1 Road

There is only one alternative design for the 200m long road extension since the road must tie into the two existing termination points just east of Deverell Street and Thickson Road. Therefore, no alternative designs were evaluated for the road component.

7.1.2 Bridge crossing Pringle Creek

Three alternative designs were explored for the bridge crossing Pringle Creek:

**Alternative 1 – 22m bridge span**
A 22m-long single-span bridge constructed with precast concrete box girders.

**Alternative 2 – 40m bridge span**
A 40m-long bridge with two 20m-long bridge spans constructed with precast concrete box girders.

**Alternative 3 – 60m bridge span**
A 60-m long bridge with three single 20m long bridge spans constructed with precast concrete box girders.

It is important to note that all the bridge alternatives have a very shallow superstructure (top of road to underside of bridge) to maximize the vertical clearance under the bridge to meet hydraulic requirements as well as provide wildlife passage.
7.2 Evaluation Criteria

The bridge alternative designs were evaluated based on the following criteria:

Table 10 – Evaluation Criteria for Alternative Designs

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Sub-Factors</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation</td>
<td>Long-term vehicular demand</td>
<td>Same for all three alternative bridge</td>
</tr>
<tr>
<td></td>
<td>Town of Whitby Transportation Master Plan</td>
<td>designs</td>
</tr>
<tr>
<td></td>
<td>Safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pedestrian / Cyclist Access</td>
<td></td>
</tr>
</tbody>
</table>
## Evaluation Criteria

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Sub-Factors</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land-Use Planning</td>
<td>Town of Whitby Official Plan</td>
<td>Same for all three alternative bridge designs</td>
</tr>
<tr>
<td>Natural Environment</td>
<td>Watercourse / fisheries, Effects to Provincially Significant Wetland (PSW), Effects to wildlife and linkage, Effects on vegetation, Effects on hydrology and floodplain</td>
<td>Criteria to be used in evaluation</td>
</tr>
<tr>
<td>Social Environment</td>
<td>Noise, Air Quality, Future development opportunities</td>
<td>Same for all three alternative bridge designs</td>
</tr>
<tr>
<td>Cultural Environment</td>
<td>Built heritage and cultural heritage landscape, Archaeological resources</td>
<td>Same for all three alternative bridge designs</td>
</tr>
<tr>
<td>Climate Change</td>
<td>Climate change impacts</td>
<td>Same for all three alternative bridge designs</td>
</tr>
<tr>
<td>Economic Environment</td>
<td>Capital &amp; maintenance costs</td>
<td>Criteria to be used in evaluation</td>
</tr>
</tbody>
</table>

Therefore, the criteria that will be used to evaluate the alternative bridge designs are Natural Environment and Economic Environment.

### 7.3 Evaluation of Alternative Bridge Designs

The evaluation of the three alternative design are included in **Table 11**.

**Table 11 – Evaluation of Alternative Bridge Designs**
### Evaluation Criteria

<table>
<thead>
<tr>
<th></th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Environment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential effects to watercourse/fisheries</td>
<td>Does not span the wetland area and provides the most narrow creek footprint compared to the other alternatives. No bridge abutments (permanent structures) will be constructed in the creek.</td>
<td>Does not span the wetland area and provides more narrow creek footprint compared to Alternative 3. One bridge abutment (permanent structures) will be constructed in the creek.</td>
<td>Spans the wetland area and provides widest creek footprint. Two bridge abutments (permanent structures) will be constructed in the creek.</td>
</tr>
<tr>
<td>Potential effects to Provincially Significant Wetlands (PSW).</td>
<td>The construction footprint for all 3 alternatives is very similar. Better long term recovery of wetland with smaller bridge span.</td>
<td>The construction footprint for all 3 alternatives is very similar.</td>
<td>The construction footprint for all 3 alternatives is very similar.</td>
</tr>
<tr>
<td>Potential effect to wildlife and linkages.</td>
<td>Provides a slightly smaller opening (openness ratio 1.28) for wildlife passage for small to medium mammals compared to Alternative 2. Wildlife ledges can be incorporated under the bridge design to address movement during periods of high water.</td>
<td>Provides the largest opening (openness ratio range from 1.21 to 1.34) for wildlife passage for small to medium mammals.</td>
<td>Provides the smallest opening (openness ratio range from 0.93 to 1.31) for wildlife passage for small to medium mammals.</td>
</tr>
<tr>
<td>Potential effect to vegetation (for all alternatives, due to the low vertical clearance, the area under the bridge will not receive sunlight thus restricting vegetation growth).</td>
<td>Smallest area under the bridge that does not promote recovery of or support restoration vegetation.</td>
<td>Large area under the bridge that does not promote recovery of or support restoration vegetation.</td>
<td>Largest area under the bridge that does not promote recovery of or support restoration vegetation.</td>
</tr>
<tr>
<td>Potential effect on hydrology and flood plain.</td>
<td>Allows the 100 year flows to pass under the bridge. No hydraulic impact to the proposed subdivision and existing surrounding lands.</td>
<td>Allows the 100 year flows to pass under the bridge. No hydraulic impact to the proposed subdivision and existing surrounding lands.</td>
<td>Allows the 100 year flows to pass under the bridge. No hydraulic impact to the proposed subdivision and existing surrounding lands.</td>
</tr>
</tbody>
</table>

### Economic Environment

<table>
<thead>
<tr>
<th></th>
<th>Most Preferred</th>
<th>Preferred</th>
<th>Least Preferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative cost in terms of capital costs and maintenance costs.</td>
<td>Least costly of all alternatives.</td>
<td>Lower cost alternatives.</td>
<td>Most costly alternative.</td>
</tr>
</tbody>
</table>

**Conclusion**

<table>
<thead>
<tr>
<th></th>
<th>Most Preferred</th>
<th>Preferred</th>
<th>Least Preferred</th>
</tr>
</thead>
</table>
7.4 Hydraulic Analysis

In partnership with the Central Lake Ontario Conservation Authority, the Town of Whitby completed the Pringle Creek Master Plan Update in 2018. TMIG used the updated hydraulic model from the Master Plan to review the hydraulic impact of the three alternative bridge solutions upstream and downstream of the bridge.

All bridge size options provide sufficient hydraulic capacity to allow the 100 year flow to pass through the bridge. Using the smallest bridge span as an example, the 22m bridge span resulted in a maximum difference between the proposed and existing condition of 0.20m which occurs immediately upstream of the bridge. This increase is localized within the extent of the floodplain and is contained entirely within the protected valley corridor that has been or will be conveyed to the Town of Whitby. Additionally, despite the increase, the proposed bridge provides sufficient capacity to pass through the 100 year flow. The water levels have also been compared with the proposed grading plan for the proposed subdivision and the 100 year water level is at least 0.3m lower than the rear lot line of the proposed residential homes. Therefore, the proposed road extension will not hydraulically impact the proposed subdivision and existing surrounding lands.

The hydraulic analysis is included in the Stormwater Management Study in Appendix G.
8 RECOMMENDED DESIGN

8.1 Proposed Bridge Design

The proposed bridge for the Dryden Boulevard crossing of Pringle Creek is a single 22 metre span structure utilizing 700 mm deep precast, prestressed concrete box beams, placed side-by-side, as the spanning element with integral abutments founded on a single row of steel piles. Concrete box beams were specifically used for this bridge to provide for a shallower superstructure depth, the thickness between the top of the driving surface and the underside of the box beams, to accommodate watercourse hydraulics as well as the road profile grade.

The crossing structure design spans the tributary to Pringle Creek, with no placement of structures (i.e., bridge abutments) within the watercourse.

The bridge design includes provision for wildlife passage for small to medium sized mammals through the Pringle Creek valleyland and watercourse corridor. The target openness ratio used was a minimum of 0.2.

In addition to providing for a single through lane in each direction for vehicular traffic, the bridge section also provides for a sidewalk, multi-use path, two bike lanes, a left turn lane, and a right turn lane. The concrete parapet wall and steel railings on either side of the bridge deck are taller than typical barriers on structures at 1.37 metres to safely accommodate cyclists.

The Preliminary General Arrangement Drawing is included in Appendix L.

8.2 Proposed Road Design

The proposed Dryden Boulevard will extend from just east of Deverell Street/Puttingedge Drive to Thickson Road. The road west of Thickson will be a 3 lane road (2 lane road with centre turn lane with 2m wide on road bike lanes, 1.5m sidewalk on the south side and 3.0 multi-use-path on the north side of Dryden Boulevard.

The future Minto Development will have access to Dryden Boulevard on the south side of the extension. A westbound left turn bay will be required on Dryden Boulevard at Street A (Bremner Street), as shown in Figure 17.

The intersection of Dryden Boulevard and Street ‘A’ (Bremner Street) will not be signalized and will be free-flow in the east-west direction.

At Thickson Road, the proposed west approach of Dryden Boulevard will include an eastbound left turn lane, one through lane and a shared through-right lane. The
The westbound receiving lane is a single lane. There is a raised 30 metre concrete median at the intersection.

The 2.0 metre bicycle lanes on both sides of Dryden Boulevard will terminate on the west side of Thickson Road. The Town will review the need for on road bicycle lanes east of Thickson Road in a separate study.

Based on the Traffic Assessment, modification to Thickson Road (Regional Road 26) and Dryden Boulevard intersection are required. These modifications include a northbound left turn lane and a dedicated southbound right turn lane on Thickson Road and eastbound dedicated left turn bay and shared through/right lane.

A 3.0m wide multi-use path (MUP) is proposed on the west side of Thickson Road which would extend from Rossland Road to Dryden Boulevard. If approved, the MUP from Rossland Road to Dryden Boulevard would be constructed as part of the Ivy Ridge development. The Region has requested that the proposed MUP, if approved, be installed at a 1.2m minimum from back of curb. The proposed boulevard width will be established during detailed design but should accommodate lighting, utilities and a 1.0m minimum flat area before the start of sloping. A future extension of the MUP north of Dryden Boulevard will be reviewed by the Town and the Region at a later date.

The Region has requested that a street lighting analysis be undertaken within the limits of the turn lanes on Thickson Road to ensure that the Region’s lighting standards are being met. Lighting will be reviewed during detailed design.

Since Thickson Road falls under the Region of Durham’s jurisdiction, the detailed design of the proposed intersection modifications and proposed multi-use-path on Thickson Road will have to been coordinated and approved by the Region of Durham.

The plan and profile of the Dryden Boulevard extension is included in Appendix L.
Figure 17 – Proposed Road Design

DRYDEN BOULEVARD EXTENSION

DRYDEN BOULEVARD EXTENSION
(THICKSON ROAD NORTH BOUND LEFT TURN LANE)

DRYDEN BOULEVARD EXTENSION
(THICKSON ROAD SOUTH BOUND RIGHT TURN LANE)
As noted in the Transportation Assessment, the following modifications may be required in the future:

- Southbound left turn storage added/modified at Puttingedge Drive and Anderson Street.
- Signalization and geometric improvements at Waller Street should the signals be warranted.

### 8.3 Wetland & Migration Corridors

Approximately 0.0008 ha of the wetland (less than 1%) will be lost for each bridge abutment. However, the loss occurs in the portion of the wetland that is currently exposed to impacts from anthropogenic disturbances. The proposed bridge is also located in the narrowest stretch of the wetland, and in an area with the least sensitive vegetation community. Overall, the changes to the wetland are expected to be of minimal extent compared to the total wetland area and it is not expected that the overall form (biodiversity) and function (i.e., water storage and release) of the wetland will be changed. In addition, all disturbed areas (outside of the permanent footprint of the bridge abutments) will be restored, re-stabilized and revegetated with native plant species to maintain the integrity of the wetland.

There is an increased potential for wildlife mortalities due to traffic collisions during operations, and the current design calls for a speed of 50 km/h within the area which will help to reduce the potential for mortalities to occur post construction. The presence of herpetofauna habitat within the wetland area presents further potential for impacts, which can be mitigated through installation of awareness signage and exclusion fencing.

### 8.4 Drainage and Stormwater Plan

Dryden Boulevard has been graded and designed to match existing grades on the existing dead-end section of Dryden Boulevard and Thickson Road which resulted in two local low points and two drainage areas, as illustrated on Figure 18. The first low point is located at Bremner Street within the proposed Minto subdivision. The runoff from the drainage area of approximately 0.51ha will be captured through catchbasins and storm sewers and drain southerly into the subdivision through the minor and major system of Bremner Street and Leaholm Court. The runoff will be treated through an OGS and a jelly fish unit to provide 80% TSS removal and then discharged into Pringle Creek, as described in Stormwater Management Report for the Minto Subdivision completed by Cole Engineering dated June 2018.
The second low point is located just east of the proposed bridge over Pringle Creek. A new storm system will be designed to capture the runoff for an area of approximately 0.40ha and discharge directly into Pringle Creek. An oil grit separator will be sized to provide 80% TSS removal and a scour pool will be installed to provide additional polishing as shown on Figure 19. CLOCA recommended that Low Impact Development (LID) measures be explored further and included in the conveyance channel during detailed design. Quantity control is not required for both drainage areas.

The Town of Whitby and CLOCA have approved the stormwater management reports for the subdivision and the Dryden Boulevard EA.

Larger sized drawings of Figure 18 and Figure 19 can be found in the Stormwater Management Report included in Appendix G.

Figure 18 - Proposed Drainage Area
8.5 Existing Utilities

There is an existing 600 mm concrete pressure pipe (CPP) feedermain that runs parallel to the proposed Dryden Boulevard extension which reduces to a 400 mm CPP watermain at Thickson Road. A SUE Level B investigation was undertaken to determine the horizontal location of the feedermain in the field.

A section of the 600mm diameter feedermain will be relocated in the vicinity of the proposed bridge since it will be in conflict with the proposed bridge piles and abutments. The extent of relocation will be determined during detailed design and coordinated with the Region of Durham.

On the west side of Thickson Road, there is also an existing 150mm gasmains and underground bell utilities that will have to be reviewed during the detailed design process to determine if relocation is required.
8.6 Property Requirements

A 30m right-of-way (ROW) is proposed for the Dryden Boulevard extension. This property will be transferred to the Town of Whitby from the Ivy Ridge Development. It should be noted that the limit of grading will extend beyond the 30m ROW.

Additional property will be required to construct the southbound right turn lane and proposed MUP on the west side of Thickson Road. This property will be dedicated to the Region of Durham from the Ivy Ridge Development. The existing and proposed property lines are included on drawing D-02 and D-03 which can be found in Appendix L.

If the relocated 600mm diameter feedermain is located outside of the proposed right-of-way, an easement will be dedicated to the Region of Durham.

The property requirements will be further refined during detailed design.

8.7 Climate Change

The Ministry of the Environment, Conservation and Parks (MECP) set out the guide “Consideration of Climate Change in Environmental Assessment in Ontario” in line with the province’s Climate Change Action Plan, which aims to fight climate change, reduce greenhouse gas pollution and facilitate a transition to a low-carbon economy.

While all new construction will produce emissions during the construction phase, the extension of Dryden Boulevard from Anderson Street to Thickson Road will provide a more direct route for east-west traffic in the area, shortening distance travelled and reducing congestion in the area. The reduction of travel time and distance results in a reduction of emissions for drivers.

During the PM Peak Hour, across the study network of 6 intersections, there was a 35% reduction of total fuel consumed between the do nothing scenario and extension of Dryden Boulevard. These reductions are due to the more efficient routing, higher average speed and less time spent stopped. These results found in Appendix H were generated from the Synchro Modelling completed as part of the Transportation Assessment.

Since the extension is a new road, climate adaptation measure such as bicycle lanes and multi-use paths will be incorporated in the design. These measures will also facilitate active transportation in the area and will encourage a more balanced modal split with walking and cycling.

The creation of an effective and robust transportation network is critical to promoting resilience to climate change. In addition, the new bridge will provide...
opportunity to include extreme weather features. As noted in Section 7.4, the bridge will be sized to allow the 100 year storm flow to pass though the bridge. The bridge will be able to withstand higher water levels that may result from more intense and frequent storms due to climate change.
9 MITIGATION MEASURES

During design and construction of the final road extension alignment and crossing structure, the project has the potential to impact sensitive natural systems. While the overall study area is largely urban in nature, the tributary of Pringle Creek and its valleyland are valuable features that promote the Greenland system and natural heritage values. Consequently, all phases of the project, including the planning, design, construction, clean-up, and remediation phases, shall avoid or minimize the potential for impacts to the natural features identified. The impact assessment has been based on the assumption that all following operational constraints, mitigation measures and protection recommendations will be considered during project activities.

9.1 Plant Communities and Significant Wetlands

The following operational constraints and protection recommendations will be considered during project activities to protect plant communities and significant wetlands:

- Vegetated and wetland areas are to be maintained to the extent possible. The development area will be clearly marked.
- If it is deemed necessary to carry out project works with industrial equipment in wetland areas or to ford industrial equipment across wetland areas, specifically the Whitby-Oshawa Iroquois Beach PSW 52 wetland, swamp mats/pads will be used to protect the wetland ecosystem and prevent rutting.
- When drilling or digging in wetland areas, specifically within the Whitby-Oshawa Iroquois Beach PSW 52 wetland, the organic layer will be stockpiled and reinstated upon construction completion to salvage seed source.
- Tree/shrub planting will be considered for planning purposes and limited to native species that exist currently within the site and region.
- All machinery should be cleaned prior to arrival in the study area to mitigate for the transfer of non-native and/or invasive species, conforming to the Clean Equipment Protocol for Industry (2016);
- The bridge design will address stormwater runoff from the bridge deck, side slopes and approaches by directing the runoff into a retention pond or vegetated area to remove suspended solids, dissipate velocity and prevent sediment and other deleterious substances from entering the wetland.
- All disturbed areas will be restored to their original contour and gradient, re-stabilized with appropriate erosion and sediment control measures, and revegetated with native seed mix and/or planted with native species.
The washing, refuelling, and servicing of machinery and storage of fuel and other materials will be conducted away from the wetland to prevent the spill of any deleterious substances into this sensitive ecosystem.

An Erosion and Sediment Control Plan will be developed and implemented for the site that minimizes risk of sedimentation of the wetland during all phases of the project. A response plan should also be developed that is to be implemented immediately in the event of a sediment release.

The contractor will develop and implement a Spill Prevention and Response Plan that minimizes risk of accidental spills or releases from entering the wetland during all phases of the project.

All disturbed areas will be restored to their original contour and gradient, re-stabilized with appropriate erosion and sediment control measures, and revegetated with native seed mix and/or planted with native species.

A permit will be submitted to CLOCA for work with the regulated area in accordance with Ontario Regulation 42/06.

9.2 Compensation

The footprint of the bridge and the road approaches are within the existing PSW, and will require compensation for the loss of existing wetland. Potential compensation could include:

- Wetland creation of a larger wetland/pond within the subdivision, along the watercourse to the south of the study area and possibly to the southwest, if access is available. This option would help support flood attenuation/storage in the area (which is a current issue) and could create potential foraging, nursery and spawning habitat for fish. There are a few potential areas for wetland creation to the south of the crossing location and alternate potential locations could exist to the southwest along the parkland adjacent to the watercourse.

- Creation of multiple wetland cells along the watercourse to the south of the study area, and possibly to the southwest, if access is available. Invasive species management in the wetland.

- Increase riparian plantings along edge of watercourse to increase corridor width and improve connection for wildlife passage.

- Restore the channel and remove barriers within the watercourse (potential to work with NGOs like Trout Unlimited for the restoration works).

- Any wetland compensation will have to consider using plants salvaged from the wetland (particularly any sensitive/locally uncommon species) and using only native, non-invasive species.
Compensation at an area ratio of 1:1 will be required as a condition of a CLOCA regulatory permit. The details and location of the compensation will be determined during detailed design stage, and will be further coordinated with CLOCA and the proposed development north and south of the proposed extension.

The disturbed boulevard areas extend into the development limits of the Minto Subdivision Development (SW-2016-02). The Environmental Impact Statement (EIS) associated with the Minto Subdivision development requires enhancement areas to be provided to offset these disturbances. CLOCA previously commented in support of the recommendations for enhancement plantings in the EIS for the Minto Subdivision development, and that these become a condition of the draft approval for this subdivision. As the proposed Dryden Boulevard extension bisects this natural heritage area, similar enhancement plantings are required for the disturbed boulevard areas along the Dryden Boulevard extension.

### 9.3 Migratory Bird Nest

Under the MBCA (Canada 1994), it is an offence to damage, destroy, remove, or disturb active migratory bird nests as defined under the MBCA. No migratory bird nests or bird eggs were observed in the study area during the field survey. Contractors will avoid destroying any incidentally observed active migratory bird nests during Project activities.

If it is determined that tree clearing is required based on detailed design, clearing will be avoided during migratory bird nesting season (April 15 – August 15) where feasible (Environment Canada 2013). If tree clearing is unavoidable during those dates, a pre-clearing nest search will be completed by a qualified biologist and a setback flagged around active nests identified during the search. Guidelines suggest that, during migratory bird breeding season, a nest search will be completed between 24 and 48 hours prior to construction activities to confirm that no active nests will be disturbed by the project.

### 9.4 Migration Corridor SWH and General Wildlife

The following operational constraints and protection recommendations will be considered during project activities to protect wildlife and their habitats:

- All vegetation clearing should occur outside of the breeding bird season (April 15 – August 15). If this is not possible, a nest search should be completed by a qualified biologist in all areas to be cleared prior to clearing activities.
- Reduce wildlife crossing impacts through posted signage indicating herpetofauna migration periods (typically May to September). The bridge
design will be assessed for the effectiveness in funnelling small to medium sized mammals and herpetofauna. In the instance of high road mortalities, a permanent exclusion fence may be considered.

- Herpetofauna and other wildlife must be removed from all isolated work areas, including wetland and open water areas, prior to construction. Relocation of turtles, frogs, and other wildlife will be undertaken by qualified personnel possessing a valid Scientific Collectors Permit obtained from the MNRF.

- Bridge design includes provision for wildlife passage (through the tributary of Pringle Creek valleyland and watercourse corridor. Wildlife ledges incorporated into the design address movement and access to habitats during times of high water and flow. Given the potential for small and medium sized mammals and herpetofauna to use the area, the openness ratio in the preliminary design is 1.28. The bridge design will be assessed for the effectiveness in funnelling small to medium sized mammals and herpetofauna.

- Plan construction to avoid sensitive breeding periods for amphibians (April to May) to the extent possible.

### 9.5 Exclusion Fencing

Exclusion fencing will be installed along all sides of the site, to prevent the movement of herpetofauna onto the site. Details of the fencing include the following:

- The exclusion fencing will consist of a silt fence or other similar fencing with fine mesh hardware cloth (on wildlife side of fence) buried at least 5 cm into the soil (Connecticut DEP 2006);

- All fencing will be securely fastened to structures or culverts. There will be no gaps between the fence posts and structures or culverts through which herpetofauna could pass;

- To prevent individuals from climbing the fence, the stakes or posts will be placed on the construction side of the fence; and,

- The exclusion fencing will be installed prior to construction, during a period of inactivity for reptiles (i.e., November through April) and maintained throughout the active season for reptiles (May to October).

### 9.6 Fish and Fish Habitat

The following operational constraints and protection recommendations will be considered during project activities for fish and aquatic habitats, including wetlands:
As work is being completed below the high watermark, within 30 m of a watercourse and within contributing CRA fish habitat a DFO Request for Review will be completed for the project and consultation with CLOCA, MNRF and DFO regarding the project impacts be undertaken.

Construction will be scheduled to avoid the wet and rainy periods and will be conducted during low flow conditions within the MNRF restricted fisheries timing window, which restricts in or near water work from September 16 to June 30 (i.e., in-water work can occur from July 1 to September 15).

Fish must be removed from all isolated work areas, including wetland and open water areas, prior to construction. Relocation of fish will be undertaken by qualified personnel possessing a valid Scientific Collectors Permit obtained from the MNRF.

Water discharges will be appropriately filtered to remove suspended sediments.

Water withdrawal and by-pass pumps will be appropriately screened using the Fisheries and Oceans Canada Freshwater Intake End of Pipe Fish Screen Guidelines (DFO 1995).

Bridge approaches will be designed and constructed to minimize loss or disturbance of riparian vegetation.

The bridge design shall address stormwater runoff from the bridge deck, side slopes and approaches by directing the runoff into a retention pond or vegetated area to remove suspended solids, dissipate velocity and prevent sediment and other deleterious substances from entering the watercourse.

The bridge design shall span the watercourse bankfull channel width of the tributary to Pringle Creek.

Only the vegetation required to accommodate operational and safety concerns for the crossing structure will be removed. The area over which vegetation in riparian areas is removed will be no more than one third (1/3) of the total vegetation in the proposed crossing right-of-way within 30 m of the ordinary high water level of the tributary to Pringle Creek.

The washing, refuelling, and servicing of machinery and storage of fuel and other materials will be conducted at least 30 m away from the watercourse and wetland to prevent any deleterious substances from entering the water.

An Erosion and Sediment Control Plan will be developed and implemented for the site that minimizes risk of sedimentation of the watercourse and wetland during all phases of the project. A response plan will also be developed that is to be implemented immediately in the event of a sediment release.
- The contractor will develop and implement a Spill Prevention and Response Plan that minimizes risk of accidental spills or releases from entering the watercourse and wetland during all phases of the project. Any spills shall be reported to the ministry’s Spills Action Centre.
- Perform as many bridge construction activities as possible well away from the watercourse and wetland (i.e., preparation of piers, footings and abutments, painting, concrete mixing, sandblasting).
- Machinery fording the watercourse or wetland to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and will occur only if an existing crossing at another location is not available or practical to use.
- If minor rutting is likely to occur, watercourse bank and bed protection methods (i.e., swamp mats, pads) will be used provided they do not constrict flows or block fish passage.
- Grading of the watercourse banks for the approaches is not permitted.
- If erosion is likely to occur as a result of equipment fording, then a temporary watercourse crossing structure will be used to protect these areas.
- The one-time fording shall adhere to the in-water work timing windows.
- Fording shall under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
- Equipment will be in clean condition (free of excess or leaking fuel, lubricants, or any other deleterious substances) and will be operated to minimize disturbance to waterbody banks and riparian vegetation.
- Equipment will be operated above the high-water level unless specified in the contract documents.
- Effective erosion and sediment control measures will be installed before commencing work, and will be regularly inspected and repaired as needed, to prevent the entry of sediment into the watercourse.
- All disturbed areas will be restored to their original contour and gradient, re-stabilized with appropriate erosion and sediment control measures, and revegetated with native seed mix and/or planted with native species.
- All stockpiled and water materials (i.e., dredging spoils, construction waste and materials, uprooted or cut aquatic plants, accumulated debris) will be contained and stabilized above the high-water mark of the watercourse to prevent re-entry.
- All construction materials will be removed from site upon crossing completion.
9.7 Air Quality

Construction activities involve heavy equipment that generates air pollutant and dust; however, these impacts are temporary in nature. Emissions during construction are difficult to predict since it is highly dependent on the machinery being used for the specific activity. The following best management practices will be included as part of the tendering process:

Regular cleaning of construction sites and access road to remove construction caused debris and dust.

- Dust suppression on unpaved haul roads and other traffic areas susceptible to dust.
- Non-chloride dust suppressants are recommended during construction.
- Loads to be covered when hauling fine grained material.
- Mud mats and tire washing to be installed at every exit from the construction site to minimize tracking of soil, mud and dust.
- Stockpiles of soil, sand and aggregate to be covered as necessary.

MECP recommended that vegetation be planted at the most impacted receptors, such as in the vicinity of Thickson Road and Dryden Boulevard, which would minimize particulate impacts at the most impacted sensitive receptors. They recommended ever green species since they would provide barriers all year round.

9.8 Noise

Construction noise could impact receptors in the vicinity of the Project Site, the following measures could be implemented during construction to mitigate noise:

- Construction equipment will be properly maintained according to manufacturer’s recommendation and be in accordance MECP Municipal Noise Control by-law.
- Construction equipment and/or activities typically known to be of annoyance (i.e. piling) will be used within the daytime period in compliance with the Town’s noise by-laws. All noise complaints will be documented and investigated by the Town.

9.9 Traffic

- Traffic impacts will be experienced during construction at the tie-in locations (Thickson Road and Deverell Street). The majority of the construction is within
the open field area. A traffic management plan will be implemented by the contractor as per OTM Book 7.

- Notices for lane/access closures will be provided to affected residents and businesses prior to the closures. For major road closures, advance information signs will be installed on site to advise motorists in advance. Public notices will also be posted on local newspapers and the Town's website.

9.10 Generation of Excess Material

- Manage all excess and unsuitable materials generated during construction appropriately, including the potential for wind erosion on stockpiles.

- Management of excess soil will be completed in accordance with the MECP's “Management of Excess Soil – A Guide for Best Management Practices” (2014). Should any contaminated soils be found, the Town will determine how and where they are to be disposed of, consistent with Part XV.1 of the Environmental Protection Act (EPA) and Ontario Regulation 153/04, Records of Site Condition.

9.11 Geotechnical and Hydrogeological Assessments

During detailed design, a geotechnical and hydrogeological assessment will be required to assess soil condition, the existence of active wells and the impact of construction dewatering. The hydrogeological assessment will also assess the need for a Permit to Take Water.
10 COST ESTIMATE AND CONSTRUCTION TIMING

The preliminary construction cost estimate for the preferred alternative design is approximately $2.9 million (including 25% contingency allowance).

The construction of the Dryden Boulevard extension is scheduled for 2021 pending budget approval by the Town of Whitby Council.
11 PERMIT/APPROVAL REQUIREMENTS

The following permits/approvals are anticipated prior to construction:

- Scientific Collectors permit from MNRF to remove fish, herpetofauna and other wildlife from the isolated work area;
- Permit from Central Lake Ontario Conservation Authority for work with the regulated area in accordance with Ontario Regulation 42/06;
- As per the Ontario Water Resources Act and the Water Taking Regulation 387/04 if it is required to take more than 400,000 litres/day of water then a Permit-to-take-Water (PTTW) will be required;
- Takings of ground water and storm water for the purpose of construction dewatering that require between 50,000L/day and 400,000L/day requires registration in the Environmental Activity Sector Registry;
- DFO Self-Assessment under the Fisheries Act in order to assess whether the works would qualify review exemption, or alternatively, require a formal DRP review request. The project will likely not require DFO review as the potential impacts will be mitigated through timing and implementation of best management practices;
- Approval from the Region of Durham for the intersection improvements at Thickson Road and Dryden Boulevard, including the multi-use path on the west side of Thickson Road.
- Approval from the Region of Durham for the relocation of the existing 600mm diameter feedermain.
- Environmental Compliance Approval from the MECP for new storm sewers and oil grit separators.

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