Environmental Study Report

Gordon Dean Avenue – Schedule ‘C’ Municipal Class Environmental Assessment (Phases 3 & 4)
Hamilton, ON
Project # TP115082

Prepared for:

Fruitland – Winona Development Group
4 Hughson Street South, Suite 1000 Hamilton, ON L8N 3Z1

6/12/2020
6/12/2020

Jack Restivo
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Fruitland – Winona Development Group
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Hamilton, ON L8N 3Z1

Dear Mr. Restivo

We are pleased to submit the Environmental Study Report for Gordon Dean Avenue – Schedule ‘C’ Municipal Class Environmental Assessment. This report documents the rationale for the Study, the background, existing and future conditions within the Study Area, the planning, design and consultation process leading to the selection of preferred alternative, anticipated positive and negative impacts, proposed mitigation measures and future commitments.

Sincerely,

Wood Environment & Infrastructure Solutions a Division of Wood Canada Limited

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‘Wood’ is a trading name for John Wood Group PLC and its subsidiaries
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Executive Summary

Study Introduction

Wood Environment & Infrastructure Solutions (Wood), a Division of Wood Canada Limited (Wood) was retained by the Fruitland – Winona Development Group, the Study proponent, to address the requirements of a Schedule ‘C’ Municipal Class Environmental Assessment (Class EA) Phases 3 & 4 Study for the proposed north-south road from Barton Street to Highway 8 and the east-west connection to Fruitland Road at Sherwood Park Road from the proposed north-south road.

The proposed north-south road is referred to as Gordon Dean Avenue, and the proposed east-west road to Fruitland Road at Sherwood Park Road from the proposed Gordon Dean Avenue is referred to as Collector Road ‘B’. Collectively these are referred to as the Project, and this Class EA Study is referred to as the Study in this report.

The City of Hamilton completed the Fruitland Road (from Barton Street to Highway 8) MCEA Phases 1 & 2 Study in 2011. Through this Study, a preferred alternative was chosen as “Creation of a New North-South Road with Fruitland Road gateway features and pedestrian crosswalk enhancements”. This formed the basis for this Gordon Dean Avenue Class EA Study Phases 3 & 4, which is now being completed by the Fruitland – Winona Development Group as the proponent.

The Fruitland – Winona Development Group is a private sector development group who currently own approximately 43.2 hectares of lands within the boundaries of Block 1, which is bordered by Fruitland Road to the west, Jones Road to the east, Barton Street to the north and Highway 8 to the south. The Fruitland – Winona Development Group initiated a Block Servicing Strategy which focuses on integrating the servicing, stormwater management, hydraulic structures, watercourse systems and natural heritage systems to a greater level of detail within Block 1 and will ultimately be a guide for the review and analysis of the future planning applications. While undertaking the Block Servicing Study, the City of Hamilton identified that the Fruitland – Winona Development Group should also complete the Gordon Dean Avenue Class EA Study, as the lands associated with the Block Servicing Strategy overlap with the Gordon Dean Avenue Class EA Study Area. Although the City of Hamilton is not the proponent of this Study, they provided technical oversight to support meeting the Class EA process and confirm that the selected design reflects the City of Hamilton’s values, standards and objectives.

This ESR was prepared to specifically document appropriate aspects of Phase 3 and 4 of the Class EA process for the Gordon Dean Avenue and Collector Road ‘B’ conducted to select the preferred roadway design concept.

Overview of Historical Background

Fruitland Road is a minor arterial road and a designated truck route that extends southerly from Lake Ontario to Highway 8 in the eastern end of the City of Hamilton (the City) (City of Hamilton, 2013; City of Hamilton, 2017). The section of Fruitland Road
between Barton Street and Highway 8 has a long history of traffic concerns related to excessive vehicle speeds and aggressive driving of trucks.

Due to concerns from Fruitland Road residents related to vehicular speeds/aggressive driving of trucks and other vehicles, the City of Hamilton completed “Fruitland Road from Barton Street to Highway 8 Municipal Class Environmental Assessment Study Phases 1 & 2” (Fruitland Road Class EA) in January 2011. The purpose of this study was to:

- Update the Regional Official Plan (superseded by the new Urban Official Plan) which was guided by the results of the 1992 Fruitland Realignment (Highway 8 to Barton Street) Class EA Study; and
- Investigate applicable traffic and access management measures with the potential to improve safety and traffic operations for all roadway users within the Study Area.

The Fruitland Road Class EA (January 2011) followed the Municipal Class Environmental Assessment process (Municipal Engineers Association, October 2000, as amended in 2007, 2011 & 2015) for Phases 1 and 2. It identified the following preferred solution:

- A new north-south road, east of the existing Fruitland Road between Highway 8 and Barton Street. Two possible alignments were identified for the north-south road (straight and curved), with final alignment and intersection at Highway 8 to be determined through subsequent planning process. Following construction and opening of the new North-South road, the current truck route designation on Fruitland Road be permanently moved to the new road as this road is to be built for this purpose;
- An east-west road connection to Fruitland Road at Sherwood Park Road from the proposed north-south road to facilitate direct traffic movement from the existing development to the new growth area.

The preferred solution derived from this Phase 1 and 2 of the Class EA was then carried forward for further consideration under Phase 3 and 4 process. The overlap of the preferred solution with the ongoing Fruitland-Winona Secondary Plan’s roadway requirements has helped to organize the delivery of the subsequent Phases of the Class EA process to establish a preferred alternative.

The overlap of the preferred solution with the roadway requirements for the Block 1 Area of the Fruitland-Winona Secondary Plan has helped to organize the delivery of the subsequent Phases of the Class EA process to establish a preferred alternative. Accordingly, the Fruitland - Winona Development Group, working in consultation with the City of Hamilton agreed to take on the responsibilities of the Class EA process as the Proponent. As such, the preferred solution identified via Fruitland Road Class EA was carried forward for further consideration under Phase 3 and 4 process. The Notice of Study Commencement was originally issued by the City of Hamilton and the Study was subsequently carried forward by the Fruitland Winona Development Group. The Class EA information is being tracked and also made available to the public by the City of Hamilton as documented on their website https://www.hamilton.ca/city-
It is considered that Phases 1 and 2 of the Fruitland Road Class EA (January 2011) satisfied the requirements of Phases 1 and 2 of the Class EA process with respect to advancing the above noted preferred solution. A Problem / Opportunity Statement (Phase 1) and a preferred solution through the development and evaluation of alternative solutions (Phase 2) were identified.

Phase 3 of the Class EA serves to identify Alternative Design Concepts for the preferred solution implementation by taking into consideration the existing environment and establish the preferred design concept by considering public and review agency input.

Phase 4 of the Class EA serves to Document the Environmental Assessment including the design and consultation process in an ESR for public review.

**Existing Conditions**

The Study Area is primarily low-density residential and agricultural land with a few commercial and institutional sites. Land to the south of Highway 8 is designated as ‘Escarpment Protection Area’ as well as ‘Greenbelt Area’. The future land use has been identified through the Fruitland - Winona Secondary Plan. Several development applications are requesting land use to be rezoned from agricultural to residential throughout the Study Area in order to implement the land use designations of the Fruitland-Winona Secondary Plan.

In order to identify constraints and sensitivities, a review of the following components was undertaken:

- Land Use
- Road Network
- Traffic
- Natural Environment
- Archaeology
- Cultural/built heritage
- Drainage
- Groundwater
- Fluvial Geomorphology

**Consultation**

Compliant consultation activities were conducted during Phase 3 of the Class EA process for this project. Public, City of Hamilton and technical agency consultation served an important function in this study. Stakeholders were notified and requested to provide input at the onset and throughout the duration of the Study, at each of two Public Information Centers and at study completion. City of Hamilton representatives, Indigenous Communities, and relevant technical agencies were also given additional consideration and engagement through direct discussions, correspondence and Technical Advisory Committee meetings. An overview of the Technical Advisory Committee and public consultation activities is provided below:
During the Public Information Centers, the Project Team received a number of comments and questions. In general, the comments concerned the following: property impact, creek channelization, Barton Street and Fruitland Road intersection configuration, protection of any cultural heritage landscape, need for active transportation considerations, and protection of natural environment and maintain greenspace. Landowners impacted by the Project were directly contacted prior to PIC #2, requesting their attendance at the PIC to discuss the preferred alignment and the potential impact on their property. One property owner contacted the Project Team post-PIC requesting clarification and more detail on the impact on their property. The Project Team provided a response on February 26, 2020 to the property owner explaining the Project and the process undertaken to arrive at the recommended preferred alternative. It was also explained that the proponent responsible for constructing the roadway within their property will consult with impacted property owners and negotiate for property acquisition. The proponent for the construction of this section of the roadway has not yet been identified.

**Class EA Phase 3 - Alternative Design Concepts**

During Phase 3 of the Class EA process, alternative design concepts were developed and evaluated using evaluation criteria that was developed to reflect the concerns of various stakeholders, as communicated through consultation.

The initial alignment options were generated based on the recommendations of the Fruitland Road Class EA (January 2011). Additional alternatives were developed in order to investigate options related to the intersection of Gordon Dean Avenue and Collector Road ‘B’. Preliminary discussions with the City of Hamilton indicated the desire for a roundabout at this intersection, however, a roundabout was later determined to be unsafe due to pedestrian traffic to and from the proposed parklands.
along the east side of Gordon Dean Avenue and thus a controlled intersection would be required. The City of Hamilton identified that the intersection must be designed at an $85^\circ - 90^\circ$ angle in order to ensure safety. This resulted in a total of seven (7) alternative alignments that were developed and analyzed. The alternatives are outlined below:

<table>
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<tr>
<th>Alignment Alternatives</th>
<th>General Description</th>
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| **Option 1a – West of former Alectra Lands** | • North-south road (Gordon Dean Avenue) would run west of the former Alectra lands.  
• East-west road would run east from Fruitland Road with curved sections in the west. |
| **Option 2a – Traverse Western Portions of former Alectra Lands. East-West Road runs parallel to Barton Street.** | • North-south road (Gordon Dean Avenue) would traverse western and northern sections of former Alectra lands.  
• East-west road would align with Sherwood Park Road at Fruitland Road. |
| **Option 2b - Traverse Western and northern Portions of former Alectra Lands + Modified East-West Road** | • North-south road (Gordon Dean Avenue) would traverse western and northern sections of former Alectra lands.  
• East-west road would run slightly north of Option 2a from Fruitland Road. |
| **Option 3a - Traverse Central and Eastern Portions of former Alectra Lands. East-West Road runs parallel to Barton Street.** | • North-south road (Gordon Dean Avenue) would traverse central and eastern sections of former Alectra lands, including the existing commercial building.  
• East-west road would align with Sherwood Park Road at Fruitland Road. |
| **Option 3b - Traverse Central and Eastern Portions of former Alectra Lands + Modified East-West Road** | • North-south road (Gordon Dean Avenue) would traverse central and eastern sections of the former Alectra lands, including the existing commercial building.  
• East-west road would run slightly north of Option 3a from Fruitland Road. |
| **Option 4a – East of former Alectra Lands. East-West Road runs parallel to Barton Street.** | • North-south road (Gordon Dean Avenue) would run mostly east of the former Alectra lands.  
• East-west road would align with Sherwood Park Road at Fruitland Road. |
| **Option 4b – East of former Alectra Lands + Modified East-West Road** | • North-south road (Gordon Dean Avenue) would run mostly east of the former Alectra lands.  
• East-west road would run slightly north of Option 4a from Fruitland Road. |

Based on the results of the evaluation process, Alternative 4b was chosen as the preferred alignment for the Gordon Dean Avenue and the Collector Road ‘B’ for the following reasons:
• It addresses the problem and opportunity statement identified in Fruitland Class EA (January 2011) i.e., it includes a new north-south road east of Fruitland Road from Barton Street to Highway 8 (Gordon Dean Avenue) to relocate the truck traffic from Fruitland Road;

• Impacts to the natural environment can be readily mitigated;

• Conforms to the Fruitland-Winona Secondary Plan, both in north-south and east-west corridor alignments;

• Avoids the need to displace existing businesses and planned civic uses on the former Alectra lands, implementation is readily feasible, and is cost-effective given the shortest distance of roadway;

• Limits private property requirements to the acquisition of two residential lots along Highway 8;

• Reduces the noise level impacts to planned residential development relative to other alternatives;

• Promotes sustainability by accommodating pedestrian and cycling infrastructure as well as improvements that will enhance transit services; and

• Designed to exceed the City of Hamilton’s design standards while performing at acceptable level of service. Based on City of Hamilton's input, the intersection of Gordon Dean Avenue and Collector Road 'B' has been designed at a 90° angle. The preferred road option will operate in an acceptable and safe manner relative to guidelines and road user expectations.
Collector Road ‘B’, east of the proposed Gordon Dean Avenue is not subject to this Class EA. To be approved under the Plan of Subdivision process.
Description of Preferred Design

Gordon Dean Avenue

Gordon Dean Avenue in the interim condition is designed as an urbanized undivided arterial road running in a north-south direction within the proposed 36.6 m Right-of-Way. A three-lane cross-section: one northbound, one southbound lane, and a center two-way left turn (TWLT) lane is provided with either on-road Cycle Lanes or a parking lane on both east and west side of the roadway separated by a buffer from travel lanes. Additionally, a multi-use path on both sides of the corridor is planned, separated by the concrete curb and gutter and boulevard.

Gordon Dean Avenue in the ultimate condition will be designed also as an urbanized undivided arterial road running in a north-south direction within the proposed 36.6 m Right-of-Way. A five-lane cross-section: two northbound, two southbound lanes, and a two-way left turn at the intersections will be provided. Additionally, a multi-use path on both sides of the corridor is planned, separated by the concrete curb and gutter and boulevard.

Collector Road ‘B’

Collector Road ‘B’ is designed as an urbanized undivided collector road running in east-west direction within a proposed 26 m road allowance. A basic two-lane cross-section: one eastbound and one westbound lane is provided. Sidewalks on both north and south side of the roadway are also part of the corridor separated by the boulevard from back of concrete curb and gutter.

Intersections

A total of four new intersections are proposed for this Project, three of them along Gordon Dean Avenue will be provided with traffic lights and operate as signalized intersections. The intersection of Collector Road ‘B’ at Fruitland Road is aligned with Sherwood Park Road on the west and will be stop controlled. The intersection of Gordon Dean Avenue and Collector Road ‘B’ will be a fully signalized intersection. Turning lanes will be incorporated at all intersections.

Stormwater Management

As noted in Section 4.2.9.3 of the Secondary Plan, the Block Servicing Strategy shall address stormwater management strategy and functional design. As such, a Stormwater Management Study was not completed as part of this Study. The on-going Block 1 Servicing Strategy will include stormwater management strategy and functional design. The stormwater management recommendations from Block 1 Servicing Strategy shall be incorporated during the detailed design phase of this roadway project, as applicable.

Illumination

Full illumination will be installed along Gordon Dean Avenue and Collector Road ‘B’ as part of the construction works and will consider cost saving measures, such as installation of LED lights. The detailed design team shall notify the appropriate system operators before making changes to the existing lighting system.
Structure

Full realignment of WC-5.0 is being proposed as part of the ongoing Block 1 Servicing Strategy. To accommodate the crossing of WC-05 by Collector Road ‘B’, an open footed span culvert is proposed to be installed immediately to the west of the existing channel. A small section of WC-5.0 at the road crossing is proposed to be realigned to accommodate the new culvert location which also facilitates the majority of construction to occur in isolation of the existing watercourse. In order to complete the channel connection to the existing channel, a new inlet and outlet channel will be constructed. These will consider fluvial geomorphological principles to provide smooth hydraulic transitions between the constructed and existing channel as well as aquatic habitat features consistent with the reach. A channel through the open footed bottom of the structure will also be based on fluvial and habitat design considerations. The opening of the structure will provide channel continuity with a floodplain and maintain wildlife corridor functions along the watercourse valley system. The new channel section will be designed as part of the detailed design phase.

Upon completion of the Block 1 Servicing Strategy, in addition to future development plans as part of the Secondary Plan, a permanent realignment channel for WC-5.0 upstream and downstream of the crossing will be designed. This channel realignment will take into full consideration the new crossing structure and associated channels to provide an effective and functional connection into the proposed culvert.

Construction Implementation

The responsibility for the design and construction of Gordon Dean Avenue from Barton Street, south to the northern limit of #703 Highway 8 (former Alectra lands) will be that of the Fruitland – Winona Development Group. The remaining section of Gordon Dean Avenue, from the northern limit of #703 Highway 8 (former Alectra lands) to Highway 8 will be the responsibility of the proponent developing those lands. Similarly, Collector Road ‘B’ from Fruitland Road to and including the intersection of Gordon Dean Avenue will be designed and constructed by the Proponent of this Study.

Construction Staging

Both the Gordon Dean Avenue and Collector Road ‘B’ will be constructed to their ultimate configuration with pavement, curbs, streetlight, and utilities provided at their ultimate locations. However, Gordon Dean Avenue is planned in two stages, namely ‘Interim’ and ‘Ultimate’. These stages differ only with respect to number and width of travel lanes. Shifting from interim to ultimate will be done by obliterating pavement markings provided during the interim stage and providing delineation with new markings under the ultimate scenario, no other construction activity is expected for this shift.

Environmental Issues and Commitments

Socio-Economic Environment - Property Requirements

Property acquisition will be required, and minor property impacts will need to be addressed to allow construction of Gordon Dean Avenue and Collector Road ‘B’. Two residential properties and a portion of the former Alectra lands (now owned by City of
Hamilton) will be required to implement the Project. Purchases will be required for Municipal addresses #703, 715 and 717 Highway 8 to allow construction of the southern section of the Gordon Dean Avenue.

There will be no impacts on local traffic during construction. Intersection development at both Highway 8 and Barton Street will be addressed by the associated environmental assessment studies and detailed design for improvements to those roadways.

Ultimately, the combined development of Gordon Dean Avenue and Collector Road ‘B’ will fulfill the objectives of the Phase 1 and 2 studies to remove truck traffic related impacts on Fruitland Road. Additional benefits will be derived from the promotion of active transportation along the Gordon Dean Avenue with development of the multi-use path.

**Natural Environment - Terrestrial Resources**

Approximately 5 ha of the vegetation communities and approximately 2.25 ha of open country habitat (meadow and marsh) will be impacted due to road construction. The open country habitat has recently supported breeding avian SAR (Bobolink and Eastern Meadowlark) and other species.

Barn Swallows, Bobolink and Eastern Meadowlark were seen within the Study Area and it is recommended that MECP be consulted during detailed design to confirm next steps for any ESA compliance considerations and if any compensation requirements will be required.

Tree and vegetation clearing and grubbing operations (including meadow areas) shall be planned to avoid seasonal timing constraint windows for wildlife. Monitoring shall be conducted to ensure that nests are not present if construction activities require clearing during nesting period. Such clearing during the constraint period shall be limited to simple habitat only.

Detailed design of the Collector Road ‘B’ crossing will consider the accommodation of maintenance of wildlife and terrestrial corridor functions at least within the area between Highway 8 and Barton Street. The structure has been selected as a span culvert allowing for floodplain benches of up to 50% of the structure opening width supporting any wildlife corridor passage function that presently exists or may develop in the future through this valley reach. The opening of the structure will be designed to accommodate small to medium sized urban wildlife with a soffit height on the order of 1.5 m above the floodplain benches. The benches will be designed such that substrate materials will not inhibit wildlife passage.

It is recommended that an Environmental Management Plan be prepared to summarize protective measures and actions during construction, and guidelines for incidents and emergencies related to natural environment, including spills release, wildlife protection, wildlife encounter procedures and wildlife rescue protocols.

During the detailed design phase, a tree inventory shall be completed, and a Tree Protection Plan shall be prepared and implemented in accordance with City of Hamilton guidelines for tree protection and trees proposed for removal.
Natural Environment - Aquatic Resources

The design for the Collector Road ‘B’ crossing of Watercourse 0.5 is a span culvert structure with an open footing. The wide span of approximately 11 m will accommodate hydrologic and geomorphological functional processes, supporting an active channel with linkage to a floodplain area.

To maintain the channel and floodplain linkage upstream, through and downstream of the structure, inlet and outlet channels will be required. The new realigned channels will be connected to the existing channel to establish a smooth hydraulic transition. The ultimate length of the channel realignment associated with the structure inlet and outlet will also be determined during the detailed design stage of the Project. As per the preliminary configuration developed for the purpose of this study, approximately 90 m of the existing channel of WC-5.0 will be realigned, with a new approximately 92 m long channel, including approximately 24 m segment that flows through the structure. Accordingly, there will be essentially no net loss of functional habitat over the long term. In order to maintain aquatic habitat function, natural channel design principles will be applied such that stream morphology and instream habitat is recreated and/or enhanced where the opportunity is feasible. Such habitat restoration will maintain the aquatic ecosystem functional attributes consistent with indirect fish habitat as described for the existing watercourse.

A vegetation restoration plan will be prepared during detailed design that applies native woody and groundcover species consistent with the local geographic region. The restoration will be applied to establish a sound riparian and overbank vegetation community within the disturbed area of the valley.

With respect to minimizing construction impacts of the structure and associated channel realignment, it is proposed that flow shall be largely maintained through the existing channel while the span culvert and new channel connections are constructed in the dry, with embankments at the upstream and downstream ends maintained as plugs to isolate the constructed realignment from the existing active channel. Once the new channel is stabilized with vegetation or other erosion control measures to be determined during detailed design, the plugs can be removed, and flow permanently directed to the new channel.

The details associated with the channel habitat and floodplain restoration zone will be developed through consultation with the City of Hamilton, Hamilton Conservation Authority and Department of Fisheries and Oceans as may be required.

Cultural Environment - Archaeological Resources

There is moderate potential for the discovery of archaeological resources in the undisturbed portions of any fields which are currently used for agricultural purposes. A Stage 2 Archaeological Assessment shall be undertaken during detailed design to confirm if any site-specific mitigation actions may be required prior to construction. The proponent shall issue information sharing letters to appropriate Indigenous communities to outline the overall study objectives, the scope of work for the Stage 2 field assessment and an invitation to have field liaisons present during Stage 2 investigation.
Cultural Environment - Built Heritage Resources and Cultural Heritage Landscapes

No significant built heritage features or cultural heritage landscapes will be displaced or disrupted as a result of this Project. Therefore, no further cultural and built heritage assessments or protection/mitigation are required.

Drainage

The ongoing Block Servicing Strategy for Block 1 Area will propose stormwater management facilities for the future development within Block 1 area, which will provide improved stormwater quality and quantity handling, including implementation of some low impact development techniques. Stormwater management recommendations from the Block 1 Servicing Strategy shall be incorporated in the detailed design phase of this Project in relation to the development of Gordon Dean Avenue and Collector Road ‘B’ to confirm that long term stormwater management and associated surface water protection requirements account for road runoff.

Groundwater

The Project is not anticipated to have a major impact on the groundwater given the shallow nature of the excavation works and the minimal spatial conversion of the roads to impervious surfaces relative to the overall landscape area.

Relevant mitigation measures identified in the draft hydrogeological assessment report from the Block 1 Servicing Strategy shall be incorporated into the detailed design phase of this Project. A private well survey should be completed within 500 m of the Study Area as a preconstruction activity to establish the presence of any active wells that are present nearby, document the quality and quantity of the water produced by these wells, and complete an assessment of the conditions of these wells.

Source Water Protection - Highly Vulnerable Aquifers

The Study Area is located within an area of Highly Vulnerable Aquifers. The runoff from the proposed roads is not anticipated to permeate to the aquifer as runoff will be conveyed to an appropriate outlet via the storm sewer system. Additionally, best management practices shall be implemented during construction to prevent any fuel lubricants and fluid spills resulting from construction activities and manage any unanticipated occurrences that could result in impacts to groundwater. All spills that could potentially cause damage to the environment will be reported to the Spills Action Centre of the Ministry of the Environment, Conservation, and Parks.

Air Quality

Air quality studies will be undertaken during detailed design to ascertain the potential impact on any sensitive receptors proposed in the planning area. Potential air quality impacts to present and future sensitive receptors will be minimized as much as possible through the design for traffic efficiency in the operation of the roadways.

Construction related air emissions can be expected, including dust from various material handling operations and combustion emissions from construction equipment, which is typically powered by diesel engines. Such emissions will be of a temporary nature and the impact is not predicted to move far from the immediate vicinity of the construction
activities along the major roads. Best management practices shall be utilized during construction to mitigate any air quality impacts caused by construction dust.

**Noise**

The operational noise impact will be addressed by a noise study to be completed during detailed design with consideration for any impact mitigation measure requirement which could include sound walls, sound berms and future development layout design where dwellings would include road lay-bys running parallel to Gordon Dean Avenue thus allowing fronts of dwellings to face the roadway such that dwellings act as sound buffers to rear yard amenity areas. Such a layout will be a component of the associated development planning process.

The contractor shall ensure that construction equipment is maintained in good operating condition to prevent unnecessary noise. The contractor shall also restrict construction activities to hours prescribed by City of Hamilton Noise Control By-Law (By-Law No. 11-285) (City of Hamilton, 2011).

**Climate Change Considerations**

The potential for climate change to influence design rainfall that may be relevant to the design of aspects of the Project. Consideration shall be given to climate change influenced rainfall in the design of drainage and stormwater management features.

**Greenhouse Gas Emissions Considerations**

Greenhouse gas emissions as a direct result of the Project development will arise from the construction and maintenance phases of the Project. Construction emissions would be expected to be of limited duration and would represent a small temporary increase. It is recommended that a greenhouse gas emissions assessment be completed early in the detailed design phase in order to quantify the greenhouse gas emissions generated by various roadway treatments and construction alternatives. The outcomes of this assessment will assist decision makers to confirm any treatments to implement.

Considering construction sustainability in planning the Project should reflect on the approach to the development and implementation of sustainable practices and approaches during the detailed design and construction phases of the Project and can be directly linked to the objectives of the City of Hamilton’s Community Climate Change Action Plan.
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List of Acronyms

BRT       Bus Rapid Transit
BSS       Block Servicing Strategy
CMA       Census Metropolitan Area
DFO       Fisheries and Oceans Canada
EA Act    Environmental Assessment Act
ECCC      Environment and Climate Change Canada
ESR       Environmental Study Report
GHG       Greenhouse Gas
HCA       Hamilton Conservation Authority
HSR       Hamilton Street Railway
IDF       Intensity-Duration-Frequency
IPCC      Intergovernmental Panel on Climate Change
IPZ       Intake Protection Zones
LID       Low Impact Development
LOS       Levels of Service
MCFN      Mississaugas of the Credit First Nation
MECP      Ministry of the Environment, Conservation and Parks
MNRF      Ministry of Natural Resources and Forestry
MTO       Ministry of Transportation
NHIC      Natural Heritage Information Center
PIC       Public Information Centre
PPS       Provincial Policy Statement
RCP       Representative Concentration Pathways
ROW       Right-of-Way
SAR       Species-at-Risk
SCUBE     Stoney Creek Urban Boundary Expansion
SWS       Subwatershed Study
TAC       Technical Agency Meeting
TMP       Transportation Master Plan
UHOP      Urban Hamilton Official Plan
VPZ       Vegetation Protection Zone
WC-5.0    Watercorse 5.0
1.0  Introduction and Background

1.1  Introduction

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood) was retained by the Fruitland - Winona Development Group, the Study proponent, to address the requirements of Municipal Class EA (Class EA) Schedule ‘C’ Phases 3 and 4 for the proposed north-south road from Barton Street to Highway 8 and the east-west connection to Fruitland Road at Sherwood Park Road from the proposed north-south road.

The proposed north-south road is referred to as Gordon Dean Avenue, and the proposed east-west road to Fruitland Road at Sherwood Park Road from the proposed Gordon Dean Avenue is referred to as Collector Road ‘B’. Collectively these are referred to as the Project, and this Class EA Study is referred to as the Study in this report.

This ESR was prepared to specifically document appropriate aspects of Phase 3 and 4 of the Class EA process for the Gordon Dean Avenue and Collector Road ‘B’ conducted to select the preferred roadway design concept. This Study builds on the recommendations of the Fruitland Road Class EA (January 2011) completed by the City, which fulfilled the requirements of Phases 1 and 2 of the Class EA process for this Project. The Study Area for this study is shown in Figure 1.1.
1.2 Historical Background

Fruitland Road is a minor arterial road and a designated truck route that extends southerly from Lake Ontario to Highway 8 in the eastern end of the City of Hamilton (the City) (City of Hamilton, 2013; City of Hamilton, 2017). The section of Fruitland Road between Barton Street and Highway 8 has a long history of traffic concerns related to excessive vehicle speeds and aggressive driving of trucks. In September 1992, the former Regional Municipality of Hamilton – Wentworth (now City of Hamilton) completed the Fruitland Road Realignment Class Environmental Assessment Study Schedule C (Phases 1 to 4), which focused on addressing problems related to traffic flow and volumes on Fruitland Road. The 1992 Environmental Study Report (ESR) recommended realignment of Fruitland Road from Barton Street to Highway 8. The 1992 ESR did not rule out a future extension of the Fruitland Road up to the Niagara Escarpment in the south. This recommended realignment was subsequently adopted in the former City of Stoney Creek’s and Regional Municipality of Hamilton-Wentworth’s Official Plans; however, the road was never built, and the approval expired.

On January 1, 2001, the new City of Hamilton was formed through amalgamation. In 2003, the City of Hamilton began the development of new Rural and Urban Official Plans for the entire amalgamated City. In October 2003, City of Hamilton Council adopted the Regional Official Plan Amendment (ROPA No. 14) and Stoney Creek Official Plan Amendment (OPA No. 99) to permit the expansion of the urban area in lower Stoney Creek. Following the Ontario Municipal Board decision to approve the expansion, the City of Hamilton initiated the Stoney Creek Urban Boundary Expansion (SCUBE) exercise (now referred to as the Fruitland – Winona Secondary Plan). Today, Fruitland Road forms the western limit of the Fruitland-Winona Secondary Plan area. At the July 8, 2010 City of Hamilton’s Council Meeting, the Fruitland Road section, from Barton Street East to Highway 8 was designated as a non-truck route from 7 p.m. to 7 a.m. (19:00 hours to 07:00 hours inclusive), seven days a week and until a new bypass route is constructed (City of Hamilton, 2010).

Due to concerns from Fruitland Road residents related to vehicular speeds/aggressive driving of trucks and other vehicles, the City of Hamilton completed “Fruitland Road from Barton Street to Highway 8 Municipal Class Environmental Assessment Study Phases 1 & 2” (Fruitland Road Class EA) in January 2011. The purpose of this study was to:

- Update the Regional Official Plan (superseded by the new Urban Official Plan) which was guided by the results of the 1992 Fruitland Realignment (Highway 8 to Barton Street) Class EA Study; and
- Investigate applicable traffic and access management measures with the potential to improve safety and traffic operations for all roadway users within the Study Area.

The Fruitland Road Class EA (January 2011) followed the Municipal Class Environmental Assessment process (Municipal Engineers Association, October 2000, as amended in 2007, 2011 & 2015) for Phases 1 and 2. It recommended a preferred solution which is shown in Figure 1.2.

The preferred solution as identified via the Fruitland Road Class EA (January 2011) (AECOM, 2011) included the following:
A new north-south road, east of the existing Fruitland Road between Highway 8 and Barton Street. Two possible alignments were identified for the north-south road (straight and curved), with final alignment and intersection at Highway 8 to be determined through subsequent planning process. Following construction and opening of the new North-South road, the current truck route designation on Fruitland Road be permanently moved to the new road as this road is to be built for this purpose;

An east-west road connection to Fruitland Road opposite Sherwood Park Road from the proposed north-south road to facilitate direct traffic movement from the existing development to the new growth area.

It is considered that Phases 1 and 2 of the Fruitland Road Class EA (January 2011) satisfied the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment process with respect to advancing the above noted preferred solution. A Problem / Opportunity Statement (Phase 1) and a preferred solution through the development and evaluation of alternative solutions (Phase 2) were identified. The preferred solution derived from this Phase 1 and 2 of the Class EA was incorporated into the Fruitland-Winona Secondary Plan, completed in 2013.

The Secondary Plan provides detailed land use, transportation, and natural heritage system plans and policies for the regulation of land use and development within the Secondary Plan area. The lands within Fruitland-Winona Secondary Plan study area consist of the lands east of Fruitland Road, north of Highway No. 8, south of Barton Street (including Winona); and the lands east of Winona, north of Highway No. 8, south of the QEW, and west of the City of Hamilton limits. The Fruitland-Winona Secondary Plan noted that a Block Servicing Strategy (BSS) will be required in order to guide the phasing of development within the Fruitland-Winona Secondary Plan area. For the purposes of developing servicing strategy, the Fruitland-Winona Secondary Plan divided the Secondary Plan lands into three blocks, based on sub-watershed catchment areas. The preferred solution identified via Fruitland Road Class EA (January 2011) is located in the Block 1 area.

The Fruitland – Winona Development Group initiated a BSS for the Block 1 Area which focuses on integrating the servicing, stormwater management, hydraulic structures, watercourse systems and natural heritage systems to a greater level of detail within Block 1 and will ultimately be a guide for the review and analysis of the future planning applications. The overlap of the preferred solution with the roadway requirements for the Block 1 Area of the Fruitland - Winona Secondary Plan has helped to organize the delivery of the subsequent Phases of the Class EA process to establish a preferred alternative. Accordingly, the Fruitland Winona Development Group working in consultation with the City of Hamilton agreed to take on the responsibilities of the Class EA process as the Proponent. As such, the preferred solution identified via Fruitland Road Class EA was carried forward for further consideration under Phase 3 and 4 process. The Notice of Study Commencement was originally issued by the City of Hamilton and was subsequently carried forward by the Fruitland - Winona Development Group. The Class EA information is being tracked and also made available to the public by the City of Hamilton as documented on their website https://www.hamilton.ca/city-
Phase 3 of the Class EA serves to identify Alternative Design Concepts for the preferred solution implementation by taking into consideration the existing environment and establish the preferred design concept by considering public and review agency input.

Phase 4 of the Class EA serves to Document the Environmental Assessment including the design and consultation process in an ESR for public review.
Figure 1.2. Phase 1 and 2 Preferred Planning Solution for Fruitland Road
1.3 Environmental Assessment

The Ontario Environmental Assessment Act (R.S.O. 1990, c. E.18; EA Act) was put into place to provide for the protection, conservation and wise management of the environment within the province. The EA Act applies to all projects being undertaken by provincial, municipal or other public bodies within the province (unless explicitly exempted). It defines the environmental assessment works that must be completed prior to commencement of any undertaking, as well as the proponent’s obligations to consult with all affected and/or interested parties.

No undertaking that falls under the scope of the EA Act can proceed until the Minister of the Ministry of the Environment, Conservation and Parks (MECP) provides approval of the submitted EA documentation. This includes resolution of public appeals made in accordance with section 7.2(3) of the EA Act.

1.3.1 Municipal Class Environmental Assessment Process

The Class EA process is a mechanism by which planning, and approval of municipal infrastructure is provided in an efficient, timely, economical and environmentally responsible manner. It represents a consistent, streamlined and easily understood process for planning and implementing municipal infrastructure projects. Under the EA Act, projects are classified as approved, subject to screening, subject to an approved Class Environmental Assessment process, or subject to a full Individual Environmental Assessment. This Study was classified as being subject to the Class EA process. It was carried out according to the requirements outlined in the Municipal Engineers Association document titled Municipal Class Environmental Assessment (October 2000, as amended in 2007, 2011 & 2015).

Consistent with the Class EA, the study approach was designed to meet the following objectives:

1. Protection of the environment, including natural, social and economic components of the environment.
2. Participation of a broad range of stakeholders in the study process to allow for sharing of ideas, education, testing of creative solutions and developing alternatives.
3. Documentation of the study process in compliance with all phases of the Class EA process.

The Class EA process classifies projects according to their level of complexity and potential environmental impacts. These are termed “Schedules” and are summarized below:

- **Schedules A and A+** includes projects that involve minor modifications to existing facilities. Environmental effects of these projects are generally small; therefore, the projects are considered pre-approved.
- **Schedule B** includes projects that involve improvements and minor expansion to existing facilities. There is a potential for some adverse environmental impacts and, therefore, the proponent is required to proceed through a screening process, including consultation with those affected. Schedule B projects are required to proceed through Phases 1, 2 and 5 of the Class EA process.
Schedule C includes projects that involve construction of new facilities and major expansion of existing facilities. These projects proceed through the environmental assessment planning process outlined in the Class EA document. These projects are required to fulfill the requirements of all five phases of the Class EA process.

This Study was carried out under the requirements of a Schedule ‘C’ Class EA (Phases 3 and 4). The following Schedule C trigger, as noted in the Municipal Engineers Association’s Municipal Class EA document (October 2000, as amended in 2007, 2011 & 2015), apply to this Study:

- All other related road works with cost greater than $2,400,000 (Adjusted for inflation in 2019 to $2,600,000).
- Section A.2.9.2:
  “Ontario Regulation 345/93, made under the EA Act, designates private sector developers as subject to the requirements of the EA Act if a private sector developer is proposing an undertaking of a type listed in Schedule C and the undertaking involves the provision of roads, water or wastewater facilities for the residents of a municipality.”

The Fruitland Road Class EA (January 2011) identified the following in the 6.2 Recommendations section:

“The remaining steps of the Schedule ‘C’ Class EA planning process (i.e., Phases 3 and 4) be completed through the Integrated MEA Class EA and Planning Act process, however, the City of Hamilton will not be the proponent.”

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 considering 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 considering public and review agency input.
- **Phase 4** – Document the Environmental Assessment including the design and consultation process in an ESR 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 Phases of the Class EA process for this Study are illustrated in Figure 1.3.

**1.3.1.1 Environmental Study Report**

This ESR documents the rationale for the Study, the background to the Study, existing and future conditions within the Study Area, the planning, design and consultation process leading to the selection of preferred alternative, anticipated positive and negative impacts and proposed mitigation measures.
1.3.1.2 Filing of the ESR
In accordance with the requirements of the Municipal Class EA process, this report is being made available for a 30-day review period. A Notice of Study Completion was published in the local newspaper and letters were sent to notify the stakeholders, regulatory agencies, Indigenous communities, general public and effected property owners on the Study Mailing List. The ESR is available at City of Hamilton website for public record: https://www.hamilton.ca/city-planning/master-plans-class-eas/block-servicing-strategies-stoney-creek-and-gordon-dean-class

If members of the public, interest groups and / or government agencies feel that their concerns have not been addressed through the Class EA study process, a person or party may request the MECP to make an order for the project to comply with Part II of the EA Act (referred to as a Part II Order). More information on Part II Order requests is provide in Section 1.1.4; however, it is anticipated that all reasonable concerns will be resolved through discussion between the Fruitland – Winona Development Group and the concerned party(ies).

1.3.1.3 Part II Order Request
The Class EA process provides an opportunity for the public and other stakeholders to appeal the Class EA process undertaken by the Study Team. Under the provisions of subsection 16 of the amended EA Act, there is an opportunity under the Class EA process for the Minister of the Environment, Conservation and Parks (Minister) to review the status of a Study. 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 procedure for dealing with concerns that may result in the Minister, by order, requiring the proponent to comply with Part II of the EA Act is outlined in Section A.2.8 of the Class EA document (Municipal Engineers Association, October 2000, as amended in 2007, 2011 & 2015).

It is anticipated that reasonable concerns will be resolved through discussion between Fruitland-Winona Development Group and the concerned individual(s) or group(s) directly. Given the organization of the Project implementation and responsibilities of the City of Hamilton for components of the Project construction and ultimate assumption of the infrastructure, the City of Hamilton will be directly involved in the resolution of concerns that may be out of the control of the Fruitland - Winona Development Group.

As of July 1, 2018, a Part II Order Request Form must be used to request a Part II Order. The Part II Order Request Form is available online on the Forms Repository website (http://www.forms.ssb.gov.on.ca/) by searching “Part II Order” or “012-2206E” (the form ID number).
Figure 1.3. Municipal Class Environmental Assessment Process
1.4 Project Team Organization

The Fruitland – Winona Development Group is a private sector development group that currently own approximately 43.2 hectares of lands within the boundaries of the lands known as Block 1. Development of these lands will be consistent with the approved Fruitland-Winona Secondary Plan (2014), which includes roadways reflecting the Gordon Dean Avenue and the east-west Collector Road 'B', that are subject to this Class EA.

This Study is being undertaken in compliance with the EA Act, as this Study is identified as an exception according to Ontario Regulation 345/93:

“2. (1) An enterprise or activity by a private sector developer is defined as a major commercial or business enterprise or activity and is designated as an undertaking to which the Act applies if it is,

(a) of a type listed in Schedule C of the Municipal Class Environmental Assessment that was approved on October 4, 2000 under section 9 of the Act; and

(b) a project provided for residents of a municipality for roads, water or wastewater. O. Reg. 345/93, s. 2 (1); O. Reg. 391/01, s. 1 (1).”

This regulation allows private developers to be the proponent of a Municipal Class EA study, as long as the study is identified as a Schedule ‘C’ undertaking. In accordance with Section A.2.9.2 of the Municipal Class EA guide, two or more private sector developers may act as co-proponents together.

In the case of the Gordon Dean Avenue Class EA, the Fruitland - Winona Development Group has accepted the responsibility of undertaking this Class EA obligation, given that the roadways will be consistent with their Secondary Plan area.

The Study Team consisted of staff from the following organizations:

**Proponent:** Fruitland – Winona Development Group
Angelo Cutaia, Project Agent

**Prime Consultant:** Wood Environment & Infrastructure Solutions
Jim Enos, Consultant Project Manager
Andreas Stenzel, Environmental Lead
Mir Ahsan Talpur, Environmental Planner
Aniqa Shams, Environmental Planner
Melissa Torchia, Environmental Specialist
Muhammad Khan, Transportation Engineer

**Sub-Consultant** Dougan & Associates
Jim Dougan, Director & Senior Ecologist
2.0 Overview of Phases 1 and 2

2.1 Past and Current Adjacent Studies

The Project Team reviewed relevant sections of the available documents and reports for the following past and current adjacent studies and referenced material in this ESR as appropriate. Collectively, these documents represent studies undertaken to advance land use development and associated roadway infrastructure in and around the Study Area. Each provides information that directly supports the Project and or influences the proper integration of the Project into future development and infrastructure plans:

**Stoney Creek Urban Boundary Expansion Transportation Master Plan (2008)**

The Stoney Creek Urban Boundary Expansion (SCUBE) Transportation Master Plan (TMP) was completed in 2008 in order to address the transportation challenges associated with meeting the demands of projected population growth in SCUBE area by 2021, as well as to ensure these solutions coalesced with the City of Hamilton’s 2007 TMP. This also helps provide a transportation strategy to support the additional 223 hectares of development becoming available to the municipality. The Study Area for the Gordon Dean Class EA is located within the SCUBE study area. The SCUBE study area is bordered by Highway 8 in the south, Queen Elizabeth Way in the north, the City of Hamilton limits to the east and Fruitland Road to the west.

SCUBE TMP recommended a new Municipal Class EA Study should be conducted for Fruitland Road between Barton Street and Highway 8. It also recommended a Collector/Local Road Network, which included an east-west mid-block collector road between Fruitland Road and a proposed collector road between Jones Road and Glover Road. This east-west collector road was recommended in order to appropriately subdivide the land for future development.

**Fruitland Road from Barton Street to Highway 8 Municipal Class Environmental Assessment Study - Phases 1 & 2 (January 2011)**

The City of Hamilton initiated a Municipal Class Environmental Assessment in 2008 to address resident concerns related to excessive speeds and aggressive driving on Fruitland Road between Barton Street and Highway 8. In addition to the ‘Do Nothing’ alternative, the study considered various options for realignment of Fruitland Road south of Barton Street, as well as construction of a new, parallel, arterial roadway east of Fruitland Road. Based on the outcome of completed baseline studies, a detailed evaluation process, and consultation, the preferred planning solution was identified to be construction of a parallel arterial roadway located east of Fruitland Road. The recommended planning solution is illustrated in Figure 1.2. This is the basis of the current Gordon Dean Avenue Class EA.

Key constraints and considerations identified as part of the Phase 1 & 2 study included: Tributary #5, located adjacent to the east side of Fruitland Road, existing residential and commercial/institutional (Olympia Banquet Centre, Wesley United Church, Horizon Centre [More recently referred to as Alectra lands]) and archaeological potential along all new routes.
**Stoney Creek Urban Boundary Expansion Subwatershed Study (2014)**

The SCUBE Subwatershed Study was completed in three phases to support the Fruitland-Winona Secondary Plan. Phase 1 focused on developing an inventory of the existing environmental conditions, which included environmental constraints and additional opportunities for development. Phase 2 investigated the future land use impacts in order to create a Subwatershed Strategy. Phase 3 specifically developed an implementation plan to guide any work done by the City of Hamilton or any other proponents in the future. This strategy included recommended stormwater management measures, as well as recommendations for the maintenance, protection and enhancement of significant natural heritage features within the study area. The study recommended several stormwater management controls, including riparian planting and fish barrier removal. A number of potential SAR habitats were identified, including:

- Barn Swallow;
- Eastern Meadowlark; and
- Bobolink.

**Fruitland-Winona Secondary Plan (2014)**

In May 2014, the City of Hamilton adopted the Fruitland-Winona Secondary Plan, which established land uses, the transportation network, infrastructure requirements and development standards to guide development of the area for a 20-30-year period. The lands within Fruitland-Winona Secondary Plan study area consist of the lands east of Fruitland Road, north of Highway No. 8, south of Barton Street (including Winona); and the lands east of Winona, north of Highway 8, south of the QEW, and west of the City of Hamilton limits. In June 2018, the Local Planning Appeal Tribunal approved the Fruitland-Winona Secondary Plan (except for lands subject to site specific appeals).

The recommended land use plan for Fruitland-Winona Secondary Plan is illustrated on the Land Use Plan - Map B.7.4-1 provided at the end of this section.

The Fruitland-Winona Secondary Plan noted that a BSS will be required in order to guide the phasing of development within the Fruitland-Winona Secondary Plan area. For the purposes of developing servicing strategy, the Fruitland-Winona Secondary Plan divided the Secondary Plan lands into three blocks, based on sub-watershed catchment areas. BSS Areas within Fruitland-Winona Secondary Plan are delineated on Map B.7.4-4 provided at the end of this section. As noted in the Fruitland-Winona Secondary Plan, the BSS shall include and address the following:

- The location and configuration of schools and parks;
- The detailed road pattern and trail system;
- The boundaries of land use categories, densities and distribution of housing types;
- Consideration of the Fruitland-Winona Urban Design Guidelines;
- Meander belt width assessments for all watercourses;
- Preliminary grading strategy;
• Preferred servicing plan;
• Stormwater management strategy and functional design;
• Phasing; and,
• Addressing air drainage to minimize impacts on the tender fruit area to the south.

The Secondary Plan identified a new north-south road and an east-west collector road between Fruitland Road and Jones Road.

Block 1 Servicing Strategy (Ongoing)

The Fruitland – Winona Development Group initiated a BSS for the Block 1 Area to advance the understanding related to the provision of municipal services (roads, storm, sanitary, water, stormwater management, grading, etc.) from the current scale related to the Official Plan and Secondary Plan, to a more detailed neighbourhood scale (premised on a tertiary land use plan) for the multiple land owners holding properties within the subject block. The outcomes of this BSS will lead to coordinated submissions from the respective landowners through the Draft Plan of Subdivision process, including Functional and Detailed Servicing plans. The ecological backdrop to the BSS for Block 1 Area is represented by the governing Subwatershed Study (SWS) which was used to establish the Secondary Plan. The SWS provides planning level guidance for the:

• Management of runoff quality and quantity;
• Natural heritage system (NHS) protection and restoration;
• Management of Watercourses; and
• Protection of the Groundwater System.

Through the BSS for Block 1 Area, a Functional Stormwater and Environmental Management Plan will be developed, building upon the guidance offered in the SWS, and expanding upon data/information bases. The proposed Gordon Dean Avenue and Collector Road ‘B’ are located within the BSS for Block 1 Area Study Area.

Highway 8 (Fruitland Road to Fifty Road) Schedule ‘C’ Municipal Class EA (Ongoing)

The City of Hamilton is undertaking a Municipal Class EA Phases 3 and 4 study for improvements to Highway 8 between Fruitland Road and Fifty Road. Based on previously completed studies, it was identified that improvements would be required within the corridor to address roadway capacity, transit, active transportation and goods movement as a result of the future growth within the Fruitland-Winona Secondary Plan area. The Stoney Creek Urban Boundary Expansion (SCUBE) Transportation Master Plan (TMP), which satisfied Phase 1 and 2 of the study recommends the following:

• Several intersections to be considered for either traffic signals with turning lanes or roundabouts.
• Barton Street is preferred to Highway 8 as a future rapid transit corridor due to the greater potential ridership.
- Protect right-of-way (ROW) for future widening to a five-lane cross-section (four through lanes and a two-way left-turn lane) beyond 2021. Wood has confirmed the need for 5-lane cross-section as part of the ongoing Class EA Study for Highway 8. The preferred alternative for Highway 8 (Fruitland Road to Fifty Road) was not confirmed at the time of preparation of this ESR. As such, the ongoing Class EA Study for Highway 8 shall consider intersection design for Gordon Dean Avenue and Highway 8, as proposed in this ESR.

Based on recommendations made in the SCUBE TMP and the Fruitland-Winona Secondary Plan, and confirmed through the traffic analysis completed as part of the ongoing Class EA Study for Highway 8:

- Highway 8 will be widened to provide for two lanes of traffic in each direction.
- A centre two-way-left-turn lane will be added to make entering and exiting driveways easier and safer.
- Traffic signals and turning lanes will be added where warranted.
- Additional north-south connections will be added between Highway 8 and Barton Street (including Gordon Dean Avenue).

**Barton Street and Fifty Road Schedule ‘C’ Municipal Class EA (Ongoing)**

The City of Hamilton is undertaking a Municipal Class EA Phases 3 and 4 study for improvements to Barton Street and Fifty Road. In accordance with the recommendations made in the Fruitland-Winona Secondary Plan, the Barton Street ROW is being widened (where possible) to 40.576 m. This widened ROW will accommodate two through lanes plus a two-way-left-turn lane to the north, auxiliary lanes at intersections, and a linear park with a 4.0 m pedestrian promenade to the south. The Fifty Road ROW will be widened out to 36 m, with intersection improvements and grade separation at the Canadian National Rail Line. Infrastructure will also be designed to accommodate provision of rapid transit services along both Barton Street and Fifty Road at some point in the future.

The preferred alternative for Barton Street and Fifty Road was not confirmed at the time of preparation of this ESR. As such, the ongoing Class EA Study for Barton Street and Fifty Road shall consider intersection design for Gordon Dean Avenue and Barton Street, as proposed in this ESR.

**Natural Heritage Characterization Assessment Block 1 Lands (2019)**

Colville Consulting prepared a natural heritage characterization assessment for Block 1 lands in the City of Hamilton in 2019 to describe the natural heritage features, specifically the extent of potential core areas, linkages and restoration areas. This assessment has not yet been finalized; however, the existing conditions are consistent with the findings of the Gordon Dean Avenue Class EA review of natural environment conditions.
2.2 Phase 1: Problem/Opportunity Statement

Phase 1 of the Class EA process involves identification of a need or opportunity to address deficiencies within a Study Area. The Fruitland Road Class EA (January 2011), as noted above, identified the following problem and opportunity statement:

“Current concerns for the Fruitland Road residents are vehicle speeds/aggressive driving of trucks and other vehicles, which can cause difficulty entering and exiting fronting driveways along Fruitland Road. The residents believe that these factors contribute to the traffic safety issues in the study area. The City of Hamilton’s Fruitland-Winona Secondary Plan process presents an opportunity to address some of the problems on Fruitland Road and to establish a layout of the future road network that will connect to Fruitland Road and distribute traffic for the proposed growth area.”

This problem and opportunity consideration was then carried into Phase 2 of the Fruitland Road Municipal Class EA (January 2011) and investigated various planning solutions.

2.3 Phase 2: Alternative Solutions

Phase 2 of the Class EA process is completed to ensure that due-diligence efforts have been expended to identify alternative solutions that minimize impacts to both the natural and human environments. It is completed through a series of steps, as outlined in Table 2.1.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Identification of Alternative Solutions to the Problem</td>
</tr>
<tr>
<td>Step 2</td>
<td>Preparation of a physical description of the area where the project is to occur, and a general inventory of the natural, social and economic environments.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Identification of the net positive and negative effects of each of the alternatives developed in Step 1, including potential mitigating measures.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Evaluation of all reasonable alternative solutions identified in Step 1, taking into consideration the environmental and other factors identified in Steps 2 and 3. Identification of the preliminary preferred alternative solution.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Mandatory consultation with review agencies and the public to solicit comment and input.</td>
</tr>
<tr>
<td>Step 6</td>
<td>Selection or confirmation of the preferred solution.</td>
</tr>
</tbody>
</table>
Phase 2 requirements and the manner it was addressed in the Fruitland Road Class EA (January 2011) are summarized in Table 2.2.

<table>
<thead>
<tr>
<th>Required Component</th>
<th>Summary of Content/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Alternatives to address vehicle speeds/aggressive driving of trucks and other vehicles on Fruitland Road and establish a layout of the future road network that will connect to Fruitland Road and distribute traffic for the proposed growth area:</td>
</tr>
<tr>
<td><strong>Alternative 1 Series:</strong></td>
<td></td>
</tr>
<tr>
<td>A. “Do Nothing” Alternative</td>
<td></td>
</tr>
<tr>
<td><strong>Alternative 2 Series</strong> – Improving Fruitland Road Safety and Traffic Operations:</td>
<td></td>
</tr>
<tr>
<td>A. Cul-de-sac on Fruitland Road north of Sandy Drive</td>
<td></td>
</tr>
<tr>
<td>B. Two cul-de-sacs, on Fruitland Road, located north of Sandy Drive and north of Highway 8.</td>
<td></td>
</tr>
<tr>
<td><strong>Alternative 3 Series</strong> - Road Relocation Alternatives as identified through the Fruitland-Winona Secondary Plan. The new North-South road would intersect with Sunnyhurst Avenue at Barton Street and extend southerly to Highway 8.</td>
<td></td>
</tr>
<tr>
<td>A. A cul-de-sac south of Barton Street on Fruitland Road;</td>
<td></td>
</tr>
<tr>
<td>B. Partially closed access on Fruitland Road south of Barton Street and Sherwood Park Road (north and south bound restrictions).</td>
<td></td>
</tr>
<tr>
<td>C. Restrict northbound traffic on Fruitland Road south of Barton Street.</td>
<td></td>
</tr>
<tr>
<td>D. Maintain Fruitland Road with no access restrictions with gateway features and enhanced pedestrian crosswalks at the intersections of Fruitland Road at Barton Street and Highway 8.</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>The following inventory of the natural, social and economic environments present within the Study Area was completed:</td>
</tr>
<tr>
<td></td>
<td>• Existing Transportation Conditions Assessment</td>
</tr>
<tr>
<td></td>
<td>• Natural Environment</td>
</tr>
<tr>
<td></td>
<td>• Stage 1 Archaeological Assessment</td>
</tr>
<tr>
<td></td>
<td>• Cultural Built Heritage Resources</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Identification of the net positive and negative impacts from each of the alternatives developed in Step 1 was completed in the evaluation of alternative solutions.</td>
</tr>
</tbody>
</table>
### Table 2.2. Summary of Work that Addressed the Phase 2 EA Requirements

<table>
<thead>
<tr>
<th>Required Component</th>
<th>Summary of Content/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 4</strong></td>
<td>Evaluation of alternative solutions to deficiencies and problems identified in Step 1 was completed in the evaluation of alternative solutions. The preliminary preferred alternative solution is from the Alternative 3 Series (D).</td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>Significant consultation with agencies and the public was completed, including two Public Information Centre (PICs). Relevant government review agencies and stakeholders were consulted (e.g., Ministry of Environment, Hamilton Region Conservation Authority, Ministry of Municipal Affairs and Housing, Ministry of Culture). The City of Hamilton also met with the Fruitland-Winona Community Advisory Committee twice.</td>
</tr>
</tbody>
</table>
| **Step 6**         | The preferred solution to address the opportunities and deficiencies identified in Step 1 is **Alternative 3 Series - D (Proposed new North-South road with Fruitland Road gateway features and pedestrian crosswalks enhancements)**. The Fruitland Road Class EA (January 2011) states the following regarding the preferred solution:  
  - Addresses the problem and opportunity statement  
  - Can be implemented in conjunction with Fruitland-Winona Secondary Plan  
  - Low impact on traffic operations as well as fire/emergency and municipal services  
  - Truck Route is relocated to the new North-South road in conjunction with the proposed Fruitland-Winona Secondary Plan development  
  - Implementation of Gateway Features/Enhanced Pedestrian Crosswalk (e.g., coloured banding) is not dependent on timing of Fruitland-Winona Secondary Plan and can be constructed sooner, subject to future budget deliberations, thus providing some benefits to Fruitland Road residents at relatively low cost.  

The preferred solution will require property acquisition depending on the preferred design.
Urban Hamilton Official Plan
Fruitland-Winona
Secondary Plan
Land Use Plan
Map B.7.4-1

Legend
Residential Designations
- Low Density Residential 1
- Low Density Residential 2
- Low Density Residential 3
- Medium Density Residential 2
Commercial and Mixed Use Designations
- Local Commercial
- District Commercial
- Arterial Commercial
Parks and Open Space Designations
- Neighbourhood Park
- Community Park
- General Open Space
- Natural Open Space
Other Designations
- Employment Area - Business Park
- Institutional
- Elementary School
- Utility
- Storm Water Management
Other Features
- Area or Site Specific Policy
- Major Gateway
- Minor Gateway
- Proposed Roads
- Secondary Plan Boundary

APPEALS
Lands Under Appeal
- 238, 252 Jones Road
- 623, 625 Barton Street East
- 212 Fruitland Road
- 222, 244 McNeilly Road
- 667, 1069 Highway No. 8

Lake Ontario
3.0 Consultation

Communication and engagement play a key role in the Class EA process. Phase 3 public consultation for the Study consisted of undertaking two Public Information Centres in order to gather input on the design alternatives and the preferred design. Agency consultation included several meetings with the City of Hamilton and Hamilton Conservation Authority to discuss issues important to these stakeholders. Some of these meetings were combined with the meetings held for the ongoing Block 1 BSS. Indigenous consultation included contacting various Indigenous communities for input on the Study. A number of consultation activities were conducted during Phase 3 of the Class EA process for this study. An overview of the agency and public consultation activities is presented in Table 3.1.

<table>
<thead>
<tr>
<th>Type</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kick-off Meeting</td>
<td>August 18, 2015</td>
</tr>
<tr>
<td>Notice of Study Commencement and PIC #1, published in newspaper and mailed to Study Mailing List and City of Hamilton Councillors</td>
<td>Newspaper Advertisement: March 24 and March 31, 2017 Mail-out to City of Hamilton Councillors: March 10, 2017</td>
</tr>
<tr>
<td>PIC #1</td>
<td>April 4, 2017</td>
</tr>
<tr>
<td>Notice of PIC #2, published in newspaper and mailed to Study Mailing List</td>
<td>Newspaper Advertisement: March 23 and March 30, 2017 Mail-out: October 9, 2019</td>
</tr>
<tr>
<td>Technical Agency Committee Meeting</td>
<td>October 10, 2019</td>
</tr>
<tr>
<td>PIC #2</td>
<td>October 17, 2019</td>
</tr>
</tbody>
</table>

Details regarding the consultation with agencies and public stakeholders are further summarized in the following sections.

3.1 Study Mailing List

The City of Hamilton provided their suggested EA mailing list to Fruitland – Winona Development Group, which included agency and City of Hamilton contacts, as well as all residents living on streets bordering the Study Area. The City of Hamilton’s mailing list was used in order to maintain similar contacts as the Fruitland Road Class EA (January 2011). Additional contacts were added during the Study by request. The Study Mailing List can be found in Appendix A.

3.2 Notice of Study Commencement

A joint Notice of Study Commencement and PIC #1 for the Gordon Dean Avenue Class EA and the Block 1 and 2 Servicing Strategy, detailing the Study Area, summarizing the Study’s objectives and requesting comments, was sent to relevant stakeholders, property owners and agencies by mail, in March 2017. The combined notice was
applied given the overlapping consideration of the Gordon Dean Avenue and Collector Road ‘B’ with the servicing study area. Under the context of City of Hamilton municipal planning, the Notice was originally published by the City of Hamilton. The Notice of Study Commencement and PIC #1 was published in the Stoney Creek News on March 23 and March 30, 2017.

Copies of the newspaper advertisements are contained in Appendix A.

3.3 Public and Landowner Consultation

3.3.1 Public Information Centre #1

Public Information Centre (PIC) #1 was held on April 4, 2017 from 3:30 pm to 5:00 pm and 6:00 pm to 7:30 pm at the Stoney Creek Municipal Centre. The PIC was held in an open house drop-in format including display boards and maps detailing the progress of the Study, initial findings of background studies, alternatives being considered, and next steps in the Study. Twenty-six (26) attendees signed the attendance record.

Display boards and mapping were located along one side of the room. Participants browsed the display boards and discussed issues with Project Team members. Specific issues and concerns were raised and discussed amongst the visitors and Project Team staff. These questions and concerns were addressed by the Project Team, and participants were encouraged to provide written comments on a Comment Sheet. Three individuals provided written comments via the Comment Sheets at the PIC. One email requesting clarification on the information regarding this study provided on the City of Hamilton website was sent to the City of Hamilton after the PIC.

Mapping roll-out sheets showing the alternatives being considered were provided on tables to facilitate small group discussions and to encourage input from PIC attendees. All information presented at the PIC was posted to the City of Hamilton’s webpage on April 6, 2017 (https://www.hamilton.ca/city-planning/master-plans-class-eas/block-servicing-strategies-stoney-creek-and-gordon-dean-class)

Further details, such as PIC boards, comments sheets, sign-in sheet and general comments heard during PIC #1 can be found in Appendix A.

3.3.1.1 Summary of PIC# 1 Comments

A summary of comments received during PIC #1 and the corresponding responses including where related information can be found in this ESR are summarized in Table 3.2.

<table>
<thead>
<tr>
<th>Comment Form</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road widening of Fruitland Road</td>
<td>Thank you for your comments. Fruitland Road is not planned to be widened; therefore, the preferred solution will not impact your property. Instead, the preferred alternative is to create a new road on the existing easement.</td>
</tr>
</tbody>
</table>
### Table 3.2. PIC #1 - Summary of Comments and Responses

<table>
<thead>
<tr>
<th>Comment Received Summary</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widening will not work at the current plan</td>
<td>north-south road, which will be called the Gordon Dean Avenue, between Fruitland Road and Jones Road. Please refer to Section 6.1 for more information.</td>
</tr>
</tbody>
</table>

**Creek Channelization**
The creek leaving our property will impact our value.
The area where the creek channelization is projected to be involves the creek leaving my property? Will we be bought out for that land? If all houses do not agree to the creek channelization, what will happen next with the progress with the creek? Will the creek be cleared out regardless if the new plan happens?

Thank you for your comments.
The creek channelization will be addressed as part of Servicing Strategy for Block 1. The scope of this study is limited to addressing Class EA requirements for the proposed roads.

**Barton Street and Fruitland Road Intersection**
I prefer to leave the intersection as it is. Please, we do not want a roundabout.

Thank you for your comments.
The Barton Street and Fruitland Road intersection will remain the same. The consideration for a roundabout was in relation to the future intersection at Gordon Dean Avenue and Collector Road ‘B’. Through the evaluation process, it was determined that a roundabout was not feasible. Please refer to 5.3.2 for more information.

**Email**

**Property Impact**
It has been a long time since this process started of planning the Fruitland/Winona residential expansion area. I have been in contact with many departments at City Hall over the years concerning the bypass route and as of recently on Feb 4, I was told there has not been a decision made yet I was also told by real estate agents there was a decision made. All this in concerning the sale of our property which the outcome of the road decides is the sale goes or not. So, after all these years of planning I am asking you has a

Thank you for your comments.
We apologize that you did not receive notification to attend PIC #1. We included your contact information in our mailing list for future Study notifications, including PIC #2.
The purpose of the current study is to identify the alignment of the north-south and east-west roads. Please refer to Section 6.1 for more information.
Table 3.2. PIC #1 - Summary of Comments and Responses

<table>
<thead>
<tr>
<th>Comment Received Summary</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>decision been made on the Fruitland Road by-pass.</td>
<td></td>
</tr>
<tr>
<td>Also, why we were not notified of this meeting tonight like others were? You would think</td>
<td></td>
</tr>
<tr>
<td>that after all the worrying over the years about a road going through our dining room,</td>
<td></td>
</tr>
<tr>
<td>we just might have been kept in the loop.</td>
<td></td>
</tr>
</tbody>
</table>

3.3.2 Public Information Centre #2
PIC #2 was held on October 17, 2019 from 5:00 pm to 7:00 pm at the Stoney Creek Municipal Centre. The PIC was hosted by representatives from the Fruitland Winona Development Group, and Wood, with additional representation from the City of Hamilton. The PIC was held in an open house drop-in format including display boards and maps detailing the progress of the Study, alternatives being considered, and next steps in the Study.

The City of Hamilton’s Highway 8 Class EA interacts with this Project and therefore the PICs for both projects were scheduled to be held concurrently, on separate sides of the room at the Stoney Creek Municipal Centre. Taking the opportunity to concurrently share information on transportation planning projects occurring in close proximity to each other was intended to help reduce stakeholder fatigue and build an understanding of the interrelation of these studies. Fifty (50) attendees signed the meeting attendance record. Out of the 50 attendees, 30 residents specifically identified that they were interested in the Gordon Dean Class EA.

Participants browsed the display boards and discussed both general and specific issues with Project Team members. Questions and concerns were addressed by the Project Team verbally, and participants were encouraged to provide written comments on a Comment Sheet made available for the PIC. Three individuals provided written comments via the Comment Sheets. Mapping roll-out sheets were provided on tables showing the alternatives being considered was also provided. All information presented at the PIC was posted to the City of Hamilton’s webpage: https://www.hamilton.ca/city-planning/master-plans-class-eas/block-servicing-strategies-stoney-creek-and-gordon-dean-class

Further details, such as PIC boards, comments sheets, sign in sheet and general comments heard during PIC #2 can be found in Appendix A.

On October 4, 2019, 13 landowners potentially impacted by the Project were directly contacted prior to PIC #2 requesting their attendance at the PIC to discuss the preferred alignment and the impact on their property. Certain directly affected landowners discussed Project impacts with the Project Team and were encouraged to provide
comments and concerns in the PIC Comment Form or also in writing as per their own preference.

### 3.3.2.1 Summary of PIC #2 Comments

A summary of comments received during PIC #2, including verbal comments at the PIC #2 and the corresponding responses including where related information can be found in this ESR are provided in Table 3.3.

<table>
<thead>
<tr>
<th>Comment Received Summary</th>
<th>Responses</th>
</tr>
</thead>
</table>
| **What are your thoughts on the preliminary preferred alternative (Option 4b)?** | **Thank you for your comments.**
| Natural Environment: Fill the ditch | Natural Environment: Existing ditches will not be filled; however, the new north-south road will be designed as an urban cross-section (Urban cross-sections do not contain ditches). Please refer to Section 6.1.3 for more information. |
| Socio-economic: No honks | Socio-economic: Noise studies will be undertaken during detailed design and will include proposed mitigation measures, such as noise walls. Please refer to Section 7.7 for more information. |
| Archaeology, Cultural and Built Heritage: Fruit farms to be affected | Archaeology, Cultural and Built Heritage: The construction of Gordon Dean Avenue will not impact fruit farms. Please refer to Section 7.3 for more information. |
| Governance: N/A | |
| Sustainability / Active Transportation: Need lanes for walks and cycling and transit | Sustainability / Active Transportation: The proposed cross-section for Gordon Dean Avenue includes a multi-use path for walking and cycling. Collector Road ‘B’ includes a sidewalk for walking. Both of these roads will not be part of a transit route. Please refer to Section 6.1.3 for more information. |
| Safety: N/A | |
| Very glad to see the development projects coming to Highway 8 and Winona area. City of Hamilton has been doing a great job for generations. | |

<table>
<thead>
<tr>
<th>Comment Received Summary</th>
<th>Responses</th>
</tr>
</thead>
</table>
| **What are your thoughts on the preliminary preferred alternative (Option 4b)?** | **Thank you for your comments.**
| Natural Environment: Please protect wildlife/birds/water | Natural Environment: Through the environmental assessment process, the Project Team has identified wildlife and bird habitat and potential impact to aquatic resources. The preliminary preferred alternative will aim to avoid impacts to the natural environment. |
| Socio-economic: Parks! Please lots of greenspace. Proper sidewalks. Slow down drivers. | |
### Table 3.3. PIC #2 - Summary of Comments and Responses

<table>
<thead>
<tr>
<th>Comment Received Summary</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archaeology, Cultural and Built Heritage: Protect heritage properties and the history of the area including Indigenous. Governance: How much will tax increase? Sustainability / Active Transportation: Need bus/transit. Need proper sidewalks. Safety: School/buses/proper drop off for pedestrian/cyclist and safety for children</td>
<td>Please refer to Section 7.2 for more information on the mitigation measures proposed to protect aquatic and terrestrial resources. Socio-economic: The scope of this Study is to confirm the preferred alignment for Gordon Dean Avenue and Collector Road ‘B’. The land uses (including parks and open spaces) for the surrounding area were identified as part of the Fruitland – Winona Secondary Plan. Archaeology, Cultural and Built Heritage: Phase 1 and 2 included a Built and Cultural Heritage Study, which identified potential heritage properties within the Study Area. This Project will not impact any cultural or built heritage features of properties. Please refer to Section 7.3 for more information. Governance: The amount of property tax increase as a result of the land development cannot be determined at this time. Sustainability / Active Transportation: The proposed cross-section for Gordon Dean Avenue includes a multi-use path for walking and cycling. Collector Road ‘B’ includes a sidewalk for walking. Both of these roads will not be part of a transit route. Please refer to Section 6.1.3 and 6.1.7 for more information. Safety: Safety considerations will be considered in more detail during the detailed design phase.</td>
</tr>
</tbody>
</table>

**Verbal Comments**

<table>
<thead>
<tr>
<th>Drainage</th>
<th>All drainage issues will be addressed in detailed design and through the BSS for Block 1 Area. Please refer to Section 7.4 for more information.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culvert overflows during heavy rain</td>
<td>---</td>
</tr>
</tbody>
</table>
### Table 3.3. PIC #2 - Summary of Comments and Responses

<table>
<thead>
<tr>
<th>Comment Received Summary</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Block 1 Study Area</strong></td>
<td>The Block 1 BSS western limit is Fruitland Road, eastern limit is Watercourse 6, slight east of Jones Road, northern limit is Barton Steet and southern limit is Highway 8. Please refer to Section 2.1 for more information on the Block 1 BSS.</td>
</tr>
<tr>
<td>Clarify the study area map (i.e. what is the Block 1 BSS study area?)</td>
<td></td>
</tr>
<tr>
<td><strong>Relationship between Gordon Dean Avenue Class EA and Highway 8 Class EA</strong></td>
<td>The Gordon Dean Avenue Class EA is being completed by the Fruitland – Winona Development Group and began in 2015, while the Highway 8 EA is being completed by the City of Hamilton and began in 2019. Although the two projects study areas are adjacent, they are being completed as separate projects. Consideration is being given to the final design of both projects. Please refer to Section 2.1 for more information on the Block 1 BSS.</td>
</tr>
<tr>
<td>Why is the Highway 8 project separate from the Gordon Dean Avenue project?</td>
<td></td>
</tr>
<tr>
<td><strong>Timeframe for Construction</strong></td>
<td>The timeline for construction is not yet confirmed. The proponent constructing Gordon Dean Avenue, south of Collector Road ‘B’ is not confirmed.</td>
</tr>
<tr>
<td>Several attendees asked about the timeframe for construction and the lack of transparency about timelines.</td>
<td></td>
</tr>
<tr>
<td><strong>Property Acquisition</strong></td>
<td>Property purchase will be completed by the proponent responsible for the construction of Gordon Dean Avenue, south of Collector Road ‘B’. The proponent has not yet been identified. Please refer to Section 6.1.6 for more information.</td>
</tr>
<tr>
<td>Questions raised over the possibility of property acquisition</td>
<td></td>
</tr>
<tr>
<td><strong>Truck Traffic</strong></td>
<td>Noise impact will be addressed during detailed design. Please refer to Section 7.7 for more information.</td>
</tr>
<tr>
<td>Residents on Barton St. expressed the desire to leave this area due to the high volume of truck traffic</td>
<td></td>
</tr>
<tr>
<td><strong>Species at Risk</strong></td>
<td>Only species identified as species at risk found within the Study Area during field surveys or desktop surveys were presented at the PIC. Please refer to Section 4.4 for more information.</td>
</tr>
<tr>
<td>Why wasn’t deer and other animals currently present in the study area not identified?</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.3. PIC #2 - Summary of Comments and Responses

<table>
<thead>
<tr>
<th>Comment Received Summary</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Road Geometry</strong></td>
<td>A safety analysis was completed, and the straight alignment was identified to be the safest for trucks. Please refer to Section 6.1 for more information.</td>
</tr>
<tr>
<td>The preferred alignment is too straight. Curves are preferred to slow down traffic.</td>
<td></td>
</tr>
<tr>
<td><strong>Problem and Opportunity Statement</strong></td>
<td>This Study is based on the recommendations of the Phase 1 and 2 Fruitland Road Class EA (January 2011). The initial problem was identified as speeding concerns along Fruitland Road. By constructing Gordon Dean Avenue, truck traffic concerns are removed from Fruitland Road and Fruitland Road’s safety concerns are addressed by slowing down traffic with enhancements such as gateway features and pedestrian crosswalks. Please refer to Section 2.1 and 2.2 for more information.</td>
</tr>
<tr>
<td>Comment concerning the problem and opportunity statement from Phase 1 and 2 being unsolved. This project is different from Fruitland Road MCEA and should not be linked.</td>
<td></td>
</tr>
</tbody>
</table>

One property owner contacted the Project Team post-PIC requesting clarification and more detail on the impact on property. The Project Team provided a response on February 26, 2020 to the property owner via email and registered mail. The correspondence between Wood and the property owner can be found in Appendix A. The proponent responsible for constructing the roadway between Highway 8 and south of Collector Road ‘B’ will consult with impacted property owners and negotiate for property acquisition.

### 3.4 Indigenous Engagement

Indigenous engagement is a key component of the Class EA process. The Fruitland-Winona Development Group engaged with Indigenous communities likely to have interest based on direction provided by the province for projects on adjacent lands.

Copies of all Indigenous engagement documents can be found in Appendix B.

#### 3.4.1 Identification of Indigenous Communities

Based on Wood’s experience with City of Hamilton projects adjacent to the Study Area, such as Highway 8 Class EA and Barton Street Class EA, and the list of potentially impacted Indigenous communities obtained from MECP for those projects, Wood was able to identify the following Indigenous communities that may have an interest in the Project:

- Six Nations of the Grand River;
- Mississaugas of the Credit First Nation; and
Haudenosaunee Confederacy Chiefs Council.

On October 1, 2019, an email including an introductory letter, Project Information Sheet and Notice of PIC #2 were sent to these Indigenous groups. An additional email was sent to these Indigenous groups on May 28, 2020, to provide an update on the Study, including a summary of review of technical studies, and solicit any comments or questions. The coronavirus pandemic and associated restrictions have resulted in the closure and capacity challenges with many Indigenous communities and as such further consultation was unable to occur.

3.4.1.1 Mississaugas of the Credit First Nation

On October 2, 2019, Mississaugas of the Credit First Nation (MCFN) notified Wood that there is a low level of concern for the Study, and respectfully asked to be notified should there be changes to the Study as they may impact MCFN. MCFN also requested copies of associated environmental and/or archeological reports. MCFN further clarified that Field Liaison Representatives must be present when the previously mentioned assessments are undertaken.

3.5 Agency Consultation

Various federal, provincial and municipal agencies were contacted as part of Phase 3 consultation activities. The full list of agencies contacted to attend the PIC is provided in Appendix C, as well as meeting minutes and meeting agendas. The City of Hamilton and the Hamilton Conservation Authority were the two most involved stakeholders. City of Hamilton provided technical oversight to support meeting the Class EA process and confirm that the selected design reflects the City of Hamilton’s values, standards and objectives. The Hamilton Conservation Authority is interested in Watercourse 5.0 (WC-5.0) and the impact of the new road on the watercourse and fish habitat.

3.5.1 Meetings

3.5.1.1 City of Hamilton

The City of Hamilton was a key stakeholder that provided key input for this study. The Project Team provided various documentation during Phase 3 to the City of Hamilton for review and feedback.

As a continuation of the Fruitland Class EA and discussions/review of the Secondary Plan area transportation aspects, meetings were held with the City of Hamilton representatives, to confirm the logistic requirements related to the roadway network and how they relate to the advancement of this Project. This supported the understanding and obligations of the Fruitland - Winona Development Group and the City of Hamilton in advancing this study. The various meetings held with City of Hamilton throughout the life of the Study are summarized in Table 3.4.
### Table 3.4. Summary of Meetings with the City of Hamilton

<table>
<thead>
<tr>
<th>Date</th>
<th>Participants</th>
<th>Meeting Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Class EA Initiation Organizational Meetings</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>August 11, 2015</td>
<td>City of Hamilton and Wood</td>
<td>The purpose of this meeting was to request feedback from the City of Hamilton on the MCEA process for Gordon Dean Avenue. The City of Hamilton confirmed the main point of contact for the City of Hamilton. The City of Hamilton provided background on the Study and the outstanding tasks (PIC, technical study status etc.). Proponency of the Study was discussed. The City of Hamilton identified that their preference is to support the Class EA process but would not be included as a key contact person.</td>
</tr>
<tr>
<td>December 1, 2016</td>
<td>City of Hamilton and Wood</td>
<td>The purpose of this meeting was to discuss the land purchases of 716, 718, 720 Barton Street to facilitate connections to Barton Street and Highway 8. The meeting also confirmed that Gordon Dean Avenue will serve as a truck route and future Bus Rapid Transit (BRT) route for the entire SCUBE Secondary Plan. Lastly, the participants also discussed the phasing of development for Block 1 to allow the construction of Collector Road ‘B’.</td>
</tr>
<tr>
<td>February 6, 2017</td>
<td>City of Hamilton and Wood</td>
<td>This meeting was a continuation of the last meeting on December 1, 2016 with the purpose of discussing the land purchases of 716, 718, 720 Barton Street to facilitate connections to Barton Street and Highway 8. The participants discussed again the phasing of development for Block 1 to allow the construction of Collector Road ‘B’.</td>
</tr>
<tr>
<td><strong>Gordon Dean Class EA Process Meetings</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 19, 2018</td>
<td>City of Hamilton, HCA, Fruitland – Winona Development Group and Wood</td>
<td>This meeting was primarily regarding the Block 1 BSS, however also included discussion regarding Gordon Dean Avenue and Collector Road ‘B’. Participants confirmed the width for Gordon Dean Avenue, based on the direction from the Secondary Plan and the proposed cross-section. The City of Hamilton also confirmed that specific BRT requirements are not required to be met, as those details are still unknown at this time. The meeting also confirmed that a roundabout is not ideal for Gordon Dean Avenue and Collector Road ‘B’. Gordon Dean Avenue should meet City of Hamilton’s Development Design Standards. The angle of</td>
</tr>
</tbody>
</table>
Table 3.4. Summary of Meetings with the City of Hamilton

<table>
<thead>
<tr>
<th>Date</th>
<th>Participants</th>
<th>Meeting Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 23, 2018</td>
<td>City of Hamilton, Fruitland – Winona Development Group and Wood</td>
<td>The purpose of this meeting was to discuss the Gordon Dean and Collector Road ‘B’ intersection. The current angle of the intersection is approximately 71.5°, while the City of Hamilton prefers an angle of 90°. City of Hamilton staff were divided on this topic as some staff identified that the angle as not appropriate for a controlled intersection and that a roundabout should be considered. Whereas, other City of Hamilton staff stated that the current angle is suitable provided that turning movements for a large garbage truck can be suitably accommodated for right turns from Collector Road ‘B’ onto Gordon Dean Avenue from both directions. This requires a curb radius of 15.0 m, to be reviewed. Through further discussion, the roundabout design was eliminated from consideration after City of Hamilton staff determined potential safety issues resulting from high-pedestrian traffic. As a result, a signalized intersection was recommended to be designed which reflects ultimate traffic needs while accommodating sidewalks and a multi-use path. City of Hamilton staff recommended that Gordon Dean Avenue approaching the intersection have a pavement width which contains four (4) thru-lanes at 3.5 m wide, one (1) left turn lane at 3.5 m wide, one (1) median at 1.5 m wide and one (1) bus bay at a width to be determined by the City of Hamilton. The City of Hamilton stated that they will consider eliminating the cycling lanes from the roadway as it appears to serve as a redundancy to the multi-use path that would run along the boulevard. City of Hamilton staff recommended that Collector Road ‘B’ approaching the intersection have a pavement width comprising two (2) thru-lanes at 3.5 m wide, and one (1) left turn lane at 3.5 m wide. The action items from this meeting resulted in Wood redoing the intersection analysis to explore the possibility of adjusting the intersection angle to 85° or better. It was agreed upon that once the City of Hamilton provides...</td>
</tr>
</tbody>
</table>
Table 3.4. Summary of Meetings with the City of Hamilton

<table>
<thead>
<tr>
<th>Date</th>
<th>Participants</th>
<th>Meeting Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 7, 2019</td>
<td>Hamilton City Councillor, Fruitland – Winona Development Group and Wood</td>
<td>acceptable pavement widths at the intersection, Wood will produce an intersection plan showing turning movements for garbage trucks turning right and left onto and off of Collector ‘B’. The City of Hamilton stated that they will provide designated width, length and location of bus bays required on Gordon Dean Avenue.</td>
</tr>
<tr>
<td>March 27, 2019</td>
<td>City of Hamilton, Fruitland – Winona Development Group and Wood</td>
<td>The purpose of this meeting was to discuss the Gordon Dean Avenue alignment, specifically regarding the City of Hamilton’s preference for the alignment. The City of Hamilton identified that they prefer a curved alignment as per the Secondary Plan, while still meeting a 90° at Gordon Dean Avenue and Collector Road ‘B’. The Fruitland – Winona Development Group explained that this alignment will have a substantial impact on landowners and land usage and advised that a straight alignment is the safest. It was agreed that a meeting will be arranged on March 27, 2019 to review and discuss the Gordon Dean Avenue alignment assessment. This meeting resulted in an action item for Wood to prepare a written scope outline regarding a high-level safety review including roll plans of three (3) Gordon Dean Avenue alignments in advance of the March 27, 2019 meeting for the City of Hamilton to consider.</td>
</tr>
<tr>
<td>May 27, 2019</td>
<td>City of Hamilton, Fruitland – Winona Development</td>
<td>The purpose of this meeting was to discuss the Gordon Dean Avenue alignment, which will be determined based on safety, ease of implementation, land ownership impacts and socio-economic impacts. The schedule and a checklist of items to complete in phase 3 of the EA, including the potential PIC was discussed. The City of Hamilton also explained their expectation for the final deliverable including standard roll plans, design considerations and construction of Gordon Dean Avenue.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The purpose of this meeting was to discuss the Gordon Dean Avenue alignment, specifically the new alternatives introduced and the potential impact on the former Alectra lands, which is now owned by the City of Hamilton. An update on timing and schedule of the second PIC was also discussed. City of Hamilton made several comments regarding Implementation (Category 7),</td>
</tr>
</tbody>
</table>
### Table 3.4. Summary of Meetings with the City of Hamilton

<table>
<thead>
<tr>
<th>Date</th>
<th>Participants</th>
<th>Meeting Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 27, 2019</td>
<td>Group and Wood</td>
<td>Economic (Category 4) and Acquisition of Lands (Category 2) in the approach to the assessment and criteria applied. With accommodation of these adjustments, a modified reassessment was agreed to be undertaken.</td>
</tr>
</tbody>
</table>

#### 3.5.1.2 Hamilton Conservation Authority

The Hamilton Conservation Authority (HCA) was an important agency that provided key input for this study. The City of Hamilton, the Fruitland – Winona Development Group and Wood was in attendance at the two meetings held with HCA. The various meetings held with HCA throughout the life of the Study are summarized in Table 3.5.

### Table 3.5. Summary of Meetings with the Hamilton Conservation Authority

<table>
<thead>
<tr>
<th>Date</th>
<th>Meeting Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 19, 2018</td>
<td>This meeting was primarily regarding the Block 1 BSS, however also included discussion regarding Gordon Dean Avenue and Collector Road 'B'. HCA will be confirming if a frog study is required. Dougan &amp; Associates identified that wetlands in the south west sector are not ideal frog habitat. HCA also indicated that Ministry of Natural Resources and Forestry (MNRF) does not expect to be consulted, however MNRF regulations must be followed. MNRF is particularly interested in bats and bat habitat. HCA identified that a fisheries and watercourse assessment for WC-5.0 can be completed as part of detailed design. The erosion control details incorporated Aquafor Beech stormwater criteria and has not included determining critical flows. Further additional analysis will be completed at detailed design. It was determined that further assessment of the impact of an upgraded WC-5.0 culvert at Barton Street will be completed to analyze the increase in flows downstream, as requested by HCA staff.</td>
</tr>
<tr>
<td>July 8, 2019</td>
<td>The purpose of this meeting was to discuss the proposed creek channel block width for WC-5.0, species at risk (SAR) accommodation and removal of natural heritage designation from lands along the west side of</td>
</tr>
</tbody>
</table>
Table 3.5. Summary of Meetings with the Hamilton Conservation Authority

<table>
<thead>
<tr>
<th>Date</th>
<th>Meeting Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1.</td>
<td>Although this meeting was primarily for the BSS for Block 1 Area, the discussion has implications on the Study.                                                                                           HCA confirmed that other than incorporating 6-metre-wide maintenance access buffers on either side of the proposed channel, no other buffer widths will be required. This would result in a total creek block width in the order of 46.5 metres. It was acknowledged that the original stream morphology analysis by Parrish will have to be updated for the BSS for Block 1 Area finalization to reflect the latest floodplain hydrology and HEC-RAS hydraulics (once available), the removal of the natural heritage designated lands etc., and required channel widths fine-tuned accordingly [for the Gordon Dean Class EA, an assessment of the hydrologic components would be undertaken specifically for the WC-5.0 road crossing of the Collector 'B'. HCA recommended that a comprehensive overall plan be adopted to address SAR (Bobolink). The City of Hamilton identified that that the bobolink requirement may be affected by the final alignment of Gordon Dean Avenue.</td>
</tr>
</tbody>
</table>

In addition to above, an email was sent to HCA on April 23, 2020, to request a virtual meeting (due to COVID-19 restrictions) to provide an update on the Project and obtain feedback from the HCA for consideration into this ESR and implementation phase of the Project. On May 21, 2020, the HCA responded that HCA can review the ESR and provide comments.

Meeting minutes and agendas can be found in Appendix C.

3.5.1.3 Technical Agency Committee

As part of Phase 3 consultation activities, a Technical Agency Committee (TAC) meeting was held on October 10, 2019 at the Wood’s Burlington Office (3450 Harvester Road, Suite 100), from 10:30 am to 11:30 am. The purpose of this meeting was to review alternative design concepts for the proposed Gordon Dean Avenue and review the evaluation of alternative assessment table. Meeting agenda and minutes can be found in Appendix C. A meeting invite was sent out on October 3, 2019 to the following agencies with several agencies declining (the number of attendees that participated are indicated in brackets; Table 3.6):
### Table 3.6. TAC Meeting Invitation and Attendees

<table>
<thead>
<tr>
<th>Type</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation Authorities</td>
<td>Hamilton Conservation Authority (0)</td>
</tr>
<tr>
<td>Provincial Government</td>
<td>Ministry of the Environment, Conservation and Parks (0)</td>
</tr>
<tr>
<td></td>
<td>Ministry of Transportation (0)</td>
</tr>
<tr>
<td></td>
<td>Ministry of Natural Resources and Forestry (0)</td>
</tr>
<tr>
<td></td>
<td>Ministry of Tourism, Culture and Sport (1)</td>
</tr>
<tr>
<td></td>
<td>Ministry of Municipal Affairs and Housing (0)</td>
</tr>
<tr>
<td>Municipality</td>
<td>City of Hamilton (4)</td>
</tr>
</tbody>
</table>

The TAC reviewed materials to be presented at the PIC #2, to identify and address natural and human environment constraints and provide input to the evaluation of the design alternatives. Other components of evaluation included the technical aspects, cost, and compatibility with the City of Hamilton and HCA plans and policies. The key discussion points from the TAC meeting included the impact of the former Alectra lands, the justification for Option 4b as the preliminary preferred option, the pond located at the north-eastern portion of the former Alectra lands, the Fruitland – Winona Secondary Plan alignment recommendations, impact on the Mountview Gardens cemetery, truck queues and required safety checks.

The evaluation and planned presentation material was reviewed, discussed and edited such that an agreed to presentation to the public could be prepared.

### 3.5.2 Utilities Consultation

Utility companies were contacted on September 1, 2019 to obtain mark-ups of existing infrastructure within the Study Area. Mark-ups indicate that there are various utilities present within the Study Area and further consultation is required during detailed design to confirm conflicts and determine any required relocations. The following utility companies have confirmed no conflicts:

- Alectra Utilities;
- Bell Canada (Telecon);
- Cogeco;
- Rogers;
- Rogers – Source Cable;
- Telecon;
- Union Gas; and
- Zayo.

Further details regarding utility relocation can be found in Section 0. Information received from utilities can be found in Appendix C.
4.0 Existing Conditions

4.1 Study Area
The Study Area is located within the City of Hamilton, bordered by Fruitland Road on the west, Jones Road on the east, Barton Street on the north and Highway 8 on the southside (Figure 1.2).

4.2 Socio-Economic Environment

4.2.1 Population
Per the 2016 Census, the population of the City of Hamilton is 536,917, which is a 3.3% increase from the 2011 population of 519,949 (Statistics Canada, 2017). The Study Area falls entirely within Ward 10, which as of 2016 had a population of 24,140. The population in the Ward has decreased by 0.6% from 24,280 in 2011, however, the number of dwelling units has increased by 1.8% from 8,910 to 9,070. Population and employment forecasts for the City of Hamilton as a whole, are summarized in Table 4.1.

<table>
<thead>
<tr>
<th>Horizon Year</th>
<th>Population Forecasts</th>
<th>Employment Forecasts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2031</td>
<td>680</td>
<td>310</td>
</tr>
<tr>
<td>2036</td>
<td>730</td>
<td>330</td>
</tr>
<tr>
<td>2041</td>
<td>780</td>
<td>350</td>
</tr>
</tbody>
</table>

Reference: A Place to Grow: The Growth Plan for the Greater Golden Horseshoe (Schedule 3)

Note: Values are in the thousands.

An overview of the socio-economic characteristics in the City of Hamilton, compared to the Census Metropolitan Area (CMA) is presented in Table 4.2. The City of Hamilton has an immigrant population of 24.7%, which is similar to the CMA (24.1%). Fluency in the official language, English is stated by 96.5%, with Italian being the second most popular spoken language (13.7%). Approximately 80% of the population, over the age of 15 claims to have a high school degree or equivalent. In terms of transportation, 75.9% of the employed population over 15 years with either a usual place of work or no fixed workplace address use cars, trucks or vans as the driver. Most of the population has a commuting duration of 15 – 29 minutes (38.2%) and leave work between 7:00 am to 7:59 am (24.3%).

| Table 4.2. Census Profile for Hamilton (City), Hamilton (CMA) (2016) |
|-------------------------------------------------|-----------------|-----------------|
| Population                                      | Hamilton (City) | Hamilton (CMA) |
| Population in 2016                             | 536,917         | 747,545         |
| Population in 2011                             | 519,949         | 721,053         |
| % change                                       | 3.3             | 3.7             |
| Median Age                                     | 41.5            | 42.1            |
| % over 15 years of age                         | 83.8            | 83.6            |

Immigrant Status
<table>
<thead>
<tr>
<th>Table 4.2. Census Profile for Hamilton (City), Hamilton (CMA) (2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamiton (City)</td>
</tr>
<tr>
<td>Non-immigrants (%)</td>
</tr>
<tr>
<td>Immigrants (%)</td>
</tr>
<tr>
<td>Before 1981</td>
</tr>
<tr>
<td>1981 to 1990</td>
</tr>
<tr>
<td>1991 to 2000</td>
</tr>
<tr>
<td>2001 to 2010</td>
</tr>
<tr>
<td>2001 to 2005</td>
</tr>
<tr>
<td>2006 to 2010</td>
</tr>
<tr>
<td>2011 to 2016</td>
</tr>
<tr>
<td>Non-permanent residents</td>
</tr>
<tr>
<td><strong>Language</strong></td>
</tr>
<tr>
<td>Knowledge of official languages –</td>
</tr>
<tr>
<td>English only (%)</td>
</tr>
<tr>
<td>Arabic</td>
</tr>
<tr>
<td>Croatian</td>
</tr>
<tr>
<td>German</td>
</tr>
<tr>
<td>Italian</td>
</tr>
<tr>
<td>Panjabi (Punjabi)</td>
</tr>
<tr>
<td>Polish</td>
</tr>
<tr>
<td>Portuguese</td>
</tr>
<tr>
<td>Serbian</td>
</tr>
<tr>
<td>Spanish</td>
</tr>
<tr>
<td><strong>Education</strong></td>
</tr>
<tr>
<td>% population aged 15 years and over with high school (equivalent) or more</td>
</tr>
<tr>
<td><strong>Transportation-related</strong></td>
</tr>
<tr>
<td>% employed population aged 15 years and over with a usual place of work or no fixed workplace address by mode of transportation</td>
</tr>
<tr>
<td>Car, truck or van - as a driver</td>
</tr>
<tr>
<td>Car truck or van - as a passenger</td>
</tr>
<tr>
<td>Public transit</td>
</tr>
<tr>
<td>Walked</td>
</tr>
<tr>
<td>Bicycle</td>
</tr>
<tr>
<td>Other methods</td>
</tr>
<tr>
<td><strong>Commuting Duration</strong></td>
</tr>
<tr>
<td>Less than 15 minutes</td>
</tr>
<tr>
<td>15 to 29 minutes</td>
</tr>
<tr>
<td>30 to 44 minutes</td>
</tr>
<tr>
<td>45 to 59 minutes</td>
</tr>
<tr>
<td>60 minutes and over</td>
</tr>
<tr>
<td><strong>Time leaving for Work</strong></td>
</tr>
</tbody>
</table>

Project # TP115082 | 6/12/2020
Table 4.2. Census Profile for Hamilton (City), Hamilton (CMA) (2016)

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Hamilton (City)</th>
<th>Hamilton (CMA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between 5 a.m. and 5:59 a.m.</td>
<td>8.7</td>
<td>8.1</td>
</tr>
<tr>
<td>Between 6 a.m. and 6:59 a.m.</td>
<td>18.6</td>
<td>17.9</td>
</tr>
<tr>
<td>Between 7 a.m. and 7:59 a.m.</td>
<td>24.3</td>
<td>25.6</td>
</tr>
<tr>
<td>Between 8 a.m. and 8:59 a.m.</td>
<td>20.0</td>
<td>21.0</td>
</tr>
<tr>
<td>Between 9 a.m. and 11:59 a.m.</td>
<td>10.9</td>
<td>11.0</td>
</tr>
<tr>
<td>Between 12 p.m. and 4:59 p.m.</td>
<td>17.4</td>
<td>16.4</td>
</tr>
</tbody>
</table>

4.2.2 Land Use

4.2.2.1 Existing Land Use

The existing land uses within the Study Area are predominantly derelict agricultural (designated future development), with a few residences along the existing roadways, as well as where the proposed roads intersect with the Barton Street, Fruitland Road and Highway 8 (AECOM, 2011). There are also a number of light commercial buildings throughout the Study Area. Along Highway 8, approximately 120 m west of Jones Road is the Mountview Gardens cemetery, which is abutted by the Stoney Creek Community Church and the City of Hamilton Public Works Yard. The City of Hamilton Public Works Yard was purchased from Alectra Utilities Corporation in 2019 and is referred to as the “former Alectra Lands” throughout the ESR.

According to Schedule C (Functional Road Classification) of the Urban Hamilton Official Plan (UHOP), Gordon Dean Avenue and Collector Road ‘B’ are classified as Proposed Collector Roads. According to Schedule E-1 (Urban Land Use Designations) of the UHOP, the land use within the Study Area is predominantly designated as neighbourhoods, with a small area designated as district commercial and open space (City of Hamilton, 2013).

4.2.2.2 Future Land Use

Future land uses will be in accordance with the Fruitland - Winona Secondary Plan, which provides a detailed land use plan, transportation plan, NHS plan and policies for the regulation of land use and development within the Secondary Plan area in accordance with the applicable policies of the UHOP. Fruitland - Winona Secondary Plan identified the requirements for three (3) BSS to determine and describe how the three (3) block lands will be serviced, with consideration given to aspects such as stormwater management facilities, stormwater drainage, wastewater and water infrastructure, local road network, air drainage, traffic and natural heritage. The Gordon Dean Class EA falls entirely within Block 1. The Fruitland – Winona Secondary Plan Land Use Map, Natural Heritage System Map, Transportation Classification Map and BSS Area Delineation is provided in Section 2.

Furthermore, a review of the City of Hamilton’s Development Applications Mapping (City of Hamilton, 2020a) indicates several past Committee of Adjustment and land division applications within the Study Area. The mapping did not show any new development applications within the Study Area.
4.2.3 Municipal Plans

4.2.3.1 Rapid Ready - Expanding Mobility Choices in Hamilton (2013)
The City of Hamilton’s *Rapid Ready* document outlines how it is planning for rapid transit service. The document identifies Highway 8 and Fifty Road as a part of the future extension of the ‘B’ line rapid transit network, where the ‘B’ line and its extension are identified for construction beyond 2030.

It should be noted that while the BLAST network map indicates that the ‘B’ Line will follow Highway 8 out to Fifty Road, it has now been identified that the ideal east-west link east of Fruitland Road is along Barton Street, with the rapid transit transition between Highway 8 and Barton Street occurring along Gordon Dean Avenue. The alternative assessment undertaken takes into consideration the provision for the rapid transit service. Please refer to Section 5.4 for more details.

4.2.3.2 Hamilton Official Plan (2013)
The City of Hamilton’s Official Plan implements and outlines various goals and policies that move the City of Hamilton towards its future vision. The Urban Hamilton Official Plan (UHOP) was adopted by Council in July 2009. Along with the Rural Hamilton Official Plan, these policies support other planning documents within the City of Hamilton such as the City of Hamilton’s Transportation Master Plan Review and Update (2018). The UHOP supports a roadway network that includes transit, active transportation, commercial vehicles, and automobiles. The function of the transportation network and overarching objective of the OP is to safely and efficiently move people and goods seamlessly and effectively.

Schedule C of the UHOP provides functional road classifications for the City of Hamilton’s transportation network within the urban boundary. The Schedule identifies Gordon Dean Avenue as a collector roadway which is distinguishable with the following characteristics:

- “The function of a collector road shall be equally shared between providing direct land accesses and the movement of moderate volumes of traffic within and through designated Employment or Neighbourhood Areas.

- The basic maximum right-of-way widths for urban collector roads shall be 30.480 metres in designated Employment Areas and 26.213 metres in all other areas, unless specifically described otherwise in Schedule C2 – Future Right-of-Way Dedications. (OPA 109)

- Collector roads in the urban area shall generally be organized in a grid-network and connect to minor arterial roads and major arterial roads.

- Short connecting link-roads which generally connect local internal neighbourhood ring road networks to external arterial roads shall be classified as collector roads. Several connecting link-roads are located in between arterial roads and function as mid-block collector roads.
Trucks shall generally be restricted from collector roads, except in designated Employment Areas. Wider lanes or separate facilities shall generally be in place to accommodate cyclists and sidewalks shall be provided on both sides of the street.

Horizontal traffic calming features such as curb extensions, median islands, and roundabouts shall be permitted where appropriate subject to meeting City of Hamilton Traffic Calming warrants, except in designated Employment Areas.”

The characteristics identified in the UHOP for a collector road was applied to Gordon Dean Avenue and details regarding the ROW, lane width, active transportation facilities and traffic calming features are further discussed in Section 6.

4.2.3.3 City in Motion: City-Wide Transportation Master Plan (2018)

The City of Hamilton completed its most recent City-wide TMP in 2018, which replaced the earlier 2007 Update. The City of Hamilton’s updated TMP provides policies and strategies for the transportation network to 2031. Map 3A and 3B of this document identifies Gordon Dean Avenue and Collector Road ‘B’ as a future road connection. The TMP also recommended that Highway 8 - west of Gordon Dean Avenue would accommodate the City of Hamilton’s BLAST rapid transit network (City of Hamilton, 2018). This reflects a recent change in the planned BLAST network, which originally identified rapid transit service on Highway 8 easterly to Fifty Road.

Hamilton’s Cycling Master Plan was developed in 2009 to serve as a blueprint for the City of Hamilton’s cycling infrastructure over the next 20 years. The plan outlined design guidelines for multi-use pathways and cycling lanes and routes.

As part of the city-wide TMP, the Cycling Master Plan was updated in 2018 to review the existing cycling network, facility types, measures, maintenance, supporting programs (bicycle parking, bicycle share, education and promotion) and implementation. Bike lanes are planned along Fruitland Road, from Highway 8 to Barton Street and a multi-use path is planned on Barton Street, from Fruitland Road to Jones Road. However, no bike lanes are proposed within the Study Area. The preferred cross-section proposes a buffered cycle lane or on-street parking in the interim; this will be finalized during detailed design. A multi-use path is presented in both the interim and the recommended. This is further detailed in Section 6.1.3 and 6.1.7.

4.2.4 Provincial Land Use Planning Initiatives

The following provincial planning documents were reviewed to determine their applicability to the Study Area:

- A Place to Grow: The Growth Plan for the Greater Golden Horseshoe (2019);
- A Made-in-Ontario Environmental Plan; and

These documents were reviewed to ensure the Class EA study is in line with the policies.
4.2.4.1 A Made-in-Ontario Environment Plan (2018)

The A Made-in-Ontario Environmental Plan’s (2018) purpose is to help protect air, land and water, reduce litter, waste and greenhouse gas emissions, while preparing for climate change. The plan is guided by three main principles: Clear Rules and Strong Enforcement, Trust and Transparency and Resilient Communities and Local Solutions. There are no specific actions from the A Made-in Ontario Plan applicable to this Study, however, climate change considerations were taken into account to address potential drainage and stormwater concerns from heavy rainfall. Moreover, the evaluation of alternative design concepts also takes into account innovative products / practices, such as LED streetlights and active transportation facility materials. Exact practices / products will be determined during detailed design.

4.2.4.2 A Place to Grow: The Growth Plan for the Greater Golden Horseshoe (2019)

The Growth Plan for the Greater Golden Horseshoe – A Place to Grow, was adopted in 2019, replacing the former Growth Plan for the Greater Golden Horseshoe (2017), under the provisions of the Places to Grow Act, 2005. The plan provides the framework for implementing the Provincial Government’s vision for building strong, prosperous communities by better managing growth to the year 2041 in the expanding Greater Toronto and Hamilton Area. Since implementation, the plan has been amended to provide population and employment forecasts to the year 2041.

The Growth Plan contains specific policies and directions regarding transportation infrastructure, land use planning, urban form, housing, natural heritage and resource protection to be considered by municipalities in their planning activities. Of particular interest, the Growth Plan provides direction on where growth can occur, the form of future development and future population and employment forecasts.

The relevant sections of the Growth Plan for the Gordon Dean Avenue Class EA:

3.2.2 Transportation – General

1. “Transportation system planning, land use planning, and transportation investment will be co-ordinated to implement this Plan.”

2. “The transportation system within the GGH [Greater Golden Horseshoe] will be planned and managed to:

   a) provide connectivity among transportation modes for moving people and for moving goods;
   f) provide for the safety of system users.”

3. “In the design, refurbishment, or reconstruction of the existing and planned street network, a complete streets approach will be adopted that ensures the needs and safety of all road users are considered and appropriately accommodated.” The proposed improvements discussed in this report are consistent with policies included in the Growth Plan for the Greater Golden Horseshoe (2019). The Gordon Dean Class EA provides the framework for connectivity within Block 1, in anticipation for the future development of the lands and provides an alternative route for truck traffic consistent with the findings of the Fruitland Road Class EA. The design of the preliminary preferred
alignment took into consideration the safety of all users, including drivers, pedestrians and cyclists and was designed with the complete streets approach in mind.

4.2.4.3 Provincial Policy Statement (2020)

The Provincial Policy Statement (PPS) provides for appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment. The PPS supports improved land use planning and management, which contributes to a more effective and efficient land use planning system.

The following policies within the PPS support potential improvements to the Study Area:

Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns (Section 1.1, subsection 1.1.1, (g)):

- “Healthy, livable and safe communities are sustained by: Ensuring that necessary infrastructure and public service facilities are or will be available to meet current and projected needs.”

Infrastructure and Public Service Facilities (Section 1.6, subsection 1.6.1):

- “Infrastructure and public service facilities shall be provided in an efficient manner that prepares for the impacts of a changing climate while accommodating projected needs.”

Infrastructure and Public Service Facilities (Section 1.6, subsection 1.6.7 - Transportation Systems):

- “Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs.”

The proposed improvements discussed in the Gordon Dean Class EA are consistent with policies included in the PPS. The Gordon Dean Class EA will service the future land uses proposed in Block 1, which identifies the ability for the infrastructure to meet projected needs. The Gordon Dean Class EA also includes climate change considerations in Section 7.9, which identifies that climate change influenced rainfall be considered in the drainage and stormwater features. This will be completed through the Block 1 BSS and during detailed design. Additionally, the preliminary preferred alignment for the Gordon Dean Class EA is designed in a manner which ensures safety for all users, including drivers, pedestrians and cyclists. Since Gordon Dean Avenue is proposed to be the new truck route, the road has been designed to accommodate trucks in a safe manner. Transportation

A Block 1 Traffic Operations Assessment (2019) was completed for Gordon Dean Avenue specifically to serve the development in Block 1 and used information from the Block 1 Transportation Phasing Assessment (2018), which focused on the entirety of Block 1. Both of these assessments were used to investigate existing and future traffic conditions within the Study Area. The Study assessed the need for improvements to accommodate traffic in a safe and efficient manner. This study is included in Appendix D.
4.2.5 Existing Roadway Network

The main connecting roadways within or in the vicinity of the Study Area include:

- **Fruitland Road** has a north-south minor arterial road with a posted speed limit of 50 km/h. Parking is prohibited along both sides of Fruitland Road, outside the overnight period.

- **Highway 8** has an east-west major arterial road with a posted speed limit of 60 km/h. Parking is prohibited at all times along both sides of Highway 8.

- **Jones Road** has a north-south collector road with a posted speed limit of 50 km/h. Although a “No Parking Snow Route” signs are posted along the west side of Jones Road, parking is otherwise permitted for up to 12 hours.

- **Barton Street** has an east-west major arterial road with a posted speed limit of 60 km/h. Although there are no posted restrictions, parking is permitted for up to 12 hours, except overnight.

- **Sherwood Park Road** has an east-west local road with an assumed statutory speed limit of 50 km/h. Parking is prohibited on the north side of Sherwood Park Road and the south side, west of Candy Drive. With no posted restrictions on the south side, east of Candy Drive, parking is permitted for up to 12 hours.

- **Sunnyhurst Avenue** has a north-south local road with an assumed statutory speed limit of 50 km/h. With no posted restrictions, parking is permitted for up to 12 hours.

4.2.6 Existing Traffic Conditions

The existing traffic conditions analyses indicate that all intersections and individual movements within the Study Area currently operate with acceptable v/c ratios and Levels of Service (LOS), except for the following movements at Highway 8 and Jones Road:

- Northbound left-turn (LOS D for PM peak hour); and
- Southbound left-turn (LOS D for PM peak hour).

A description of operations associated with the LOS are provided in Table 4.3.

<table>
<thead>
<tr>
<th>LOS</th>
<th>Description of Operations – Signalized Intersections</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Little to no delay at intersections</td>
</tr>
<tr>
<td>B</td>
<td>Minimal delay</td>
</tr>
<tr>
<td>C</td>
<td>Some queuing and delay (&lt;35 sec/vehicle)</td>
</tr>
<tr>
<td>D</td>
<td>Frequent queuing and delay (&lt;55 sec/vehicle)</td>
</tr>
<tr>
<td>E</td>
<td>Significant delay and queuing, occasionally vehicles may need to wait for a second green</td>
</tr>
<tr>
<td>F</td>
<td>Intolerable delays and queues</td>
</tr>
</tbody>
</table>

These conditions are not considered sufficiently deficient to warrant remedial measures.
4.2.7 Existing Transit and Active Transportation Network

Active transportation infrastructure exists throughout the Study Area and is described below in relation to the existing roadway network:

- **Fruitland Road** has a two-lane urban cross-section with sidewalks on both sides of the roadway.
- **Highway 8** has a two-lane rural cross-section with bike lanes provided on both sides of the roadway. A sidewalk is provided on the north side of Highway 8.
- **Jones Road** has a two-lane rural cross-section, except for a section from Highway 8 to a point approximately 225 metres north that is urbanized. Sidewalk is provided on the east side of the roadway within the urbanized section.
- **Barton Street** has a two-lane rural cross-section with a sidewalk provided on the south side of the roadway.
- **Sherwood Park Road** has a two-lane urban cross-section with sidewalks on both sides of the roadway.
- **Sunnyhurst Avenue** has a two-lane rural cross-section with no sidewalks.

As discussed in Section 4.2.3.3, the Cycling Master Plan does not propose any bike lanes within the Study Area. However, bike lanes are planned along Fruitland Road, from Highway 8 to Barton Street and a multi-use path is planned on Barton Street, from Fruitland Road to Jones Road.

The Hamilton Street Railway (HSR) operates one route within the Study Area, Route 55 (Stoney Creek Central), with bus stops located at the intersections of Barton Street and Fruitland Road, Barton Street and Jones Road, Highway 8 and Jones Road, at 715 Highway 8, and Highway 8 and Fruitland Road/Regalview Drive. This route operates between Eastgate Square and Jones Road via Highway 8, Jones Road, Arvin Avenue, Barton Street and Grays Road. Schedule for Route 55 – Stoney Creek Central is available on City of Hamilton’s website (City of Hamilton, 2020b)

For passengers looking to travel east of Jones Road, Trans-Cab is offered as an alternative. This is a shared-ride taxi service operated jointly by HSR and Hamilton Cab and provides service to the furthest point on Route 55 and transfer.

4.2.8 Future Traffic Conditions

Intersection operations under future (2021) conditions were analyzed for the weekday AM and weekday PM peak hours to determine the required storage lengths for turning bays at future intersections along Gordon Dean Avenue. A minimum storage length of 50 m is recommended for turning bays at the intersection of Gordon Dean Avenue / Highway 8 to accommodate trucks diverted from Fruitland Road.

The proposed development for Block 1 is expected to generate 1538 and 2102 net new trips in the AM and PM peak hours, respectively, with the assumption that 50%-75% of the site generated trips for some land uses (e.g. Elementary School, Arterial Commercial, and Local Commercial) would originate from the development, and thus, the resulting number of site generated trips to/from outside of the Study Area decreased by 15%-25% compared to total site generated trips above. The traffic volumes for the proposed development was based on the Institute of Transportation Engineers Trip
Generation Manual, which provides rates and equations to determine the peak hour traffic volume.

The analysis results for unsignalized intersections under future (2021) conditions indicate that all movements are expected to operate with residual capacity and acceptable LOS except for the following movements:

- Barton Street at Sunnyhurst Avenue
  - Northbound left movement during the AM and PM peak hours
- Gordon Dean Avenue at Highway 8
  - Southbound left movement during the PM peak hour

The analysis results for signalized intersections, however, indicate that all movements are expected to operate with residual capacity and acceptable LOS during both AM and PM peak hours under future (2021) conditions.

Additional analysis was carried out under the future (2021) total conditions assuming all future intersections will be signalized to provide controlled crossings to pedestrians along Gordon Dean Avenue. The analysis results indicate that all movements are expected to operate with residual capacity and acceptable LOS during both AM and PM peak hours under future (2021) conditions.

### 4.3 Natural Environment

This study included preparation of an Environmental Impact Assessment (EIA), based on input received from the City of Hamilton during Phase 3 consultation. Dougan & Associates was retained to develop the EIA using background information and field data related to terrestrial resources that was collected for the ongoing Block 1 BSS over the period of 2015 to 2019. An aquatic assessment was completed by Wood in 2020, the results of which were incorporated into the EIA and this ESR. The terrestrial and aquatic information is summarized in this ESR. The EIA is provided in Appendix E, and the Aquatic Assessment Report is provided in Appendix F.

#### 4.3.1 Terrestrial Resources

##### 4.3.1.1 Background Review

The following reports were reviewed as part of the EIA (Dougan & Associates, 2020). These documents were important in scoping the extent of the surveys for flora and fauna that were required to meet requirements of the Study.

- Natural Heritage Assessment of Lands Bounded by Fruitland Road, Glover Road, Barton Street, and Highway 8, City of Hamilton. Prepared for City of Hamilton by Dillon Consulting, June 2010.
- Stoney Creek Urban Boundary Expansion (SCUBE) West Subwatershed Study Phase 1 and Phase 2 Final Report; prepared for the City of Hamilton by Aquafor Beech, May 15, 2013.
4.3.1.2 Field Program

The EIA relied on the field data collected as part of the ongoing BSS for Block 1 Area from 2015 to 2019. Field surveys, including Ecological Land Classification (ELC) updates, Vascular Plant Inventory, SAR Habitat Assessments, and Breeding Bird Surveys, were conducted to verify data obtained from desktop review and to obtain new data as part of the ongoing BSS for Block 1 Area project. No specific field surveys were completed as part of this Class EA given the comprehensive effort applied for BSS for Block 1 Area. Accordingly, BSS field data results were used to inform the EIA study. Specifically, the existing data was used to characterize the natural heritage features and functions for the Class EA Study Area and evaluate potential habitat for Species at Risk (SAR). A summary of dates and conditions for the field studies that were completed for the ongoing BSS for Block 1 Area are presented in the EIA (Appendix E). As noted in the EIA, the results of the field effort are less than five (5) years of age, and therefore still considered valid for the purposes of this Class EA (Dougan & Associates, 2020).

4.3.1.3 Vegetation Resources

Ecological Land Classification

ELC communities observed within the Study Area are shown on Figure 4.1 and described below. A total of 33 ELC polygons and 20 community types were identified, including agricultural, anthropogenic, cultural, forest, thicket, and wetland. More details on the characteristics of each vegetation community within the Study Area, including dominant species, canopy structure and unique ecological features or functions are provided in the EIA (Appendix E).

Anthropogenic:

This category includes non-agricultural active land uses such as residential, commercial, industrial and institutional lands. In the Study Area, most of the anthropogenic land cover consists of residential and industrial properties along Barton Street, Jones Road, Fruitland Road, and Highway 8. These properties are mostly landscaped areas with sod and other planted vegetation. No significant vegetation species were documented within anthropogenic lands in the Study Area.
Agricultural:
This type encompasses a variety of food production lands. Within the Study Area, most agricultural lands were used previously as orchards or for row crops. Several of these areas were recently used for agricultural but are in transition towards cultural meadow. No significant vegetation species were documented within agricultural lands in the Class EA Study Area.

Cultural/Succesional:
In cases where active land management such as crop production has ceased, lands will regenerate towards a naturalized state. This spectrum of land is lumped under the ‘Cultural’ ELC designation, which for the Study Area include thickets and hedgerows. Meadows form a significant portion of the Class EA Study Area (more than a quarter of total lands). These areas were, for the most part, under active agricultural management in the past. Limited woody vegetation cover regeneration in these areas indicates generally less than a decade of succession and these lands are dominated by pioneering and disturbance tolerant grasses and forbs such as Canada Goldenrod (Solidago canadensis), Kentucky Bluegrass (Poa pratensis ssp. pratensis) and Fuller’s Teasel (Dipsacus fullonum), European Buckthorn (Rhamnus cathartica) and other shrubs such as Multiflora Rose (Rosa multiflora), Staghorn Sumac (Rhus typhina), ‘Conchord’ Grape (Vitis labrusca ‘Concord’) and dogwoods (Cornus racemosa and C. sericea) were the most common woody species observed throughout the cultural designated land types. Occasional trees included Bur Oak (Quercus macrocarpa) and Green Ash (Fraxinus pennsylvanica).

Hedgerows:
Hedgerows were also common throughout the Study Area. The vegetation community composition in these features was quite consistent throughout the Study Area: an understory dominated by European Buckthorn with a canopy of Bur Oak, Green Ash and occasionally White Ash (Fraxinus pennsylvanica and F. americana) heavily impacted by Emerald Ash Borer, and a mixed ground cover of disturbance tolerant forbs and grasses. In some instances, the invasive European Buckthorn formed most of the understory. Several Oak-Hickory woodland/savannah indicator species were noted, including Early Goldenrod (Solidago juncea), Oldfield Cinquefoil (Potentilla simplex), and Frosted Hawthorn (Crataegus pruinosa).

Forest:
Two forest types were detected within small remnant areas in the Study Area: Green Ash Hardwood Lowland Deciduous Forest and Oak-Hardwood Deciduous Forest. These polygons exhibited the highest canopy closure (i.e. highest density of canopy sized trees) and contained the largest and oldest trees within the Study Area. The Green Ash forest polygon and Oak forest polygons were at the rear of residential properties along Barton Street, and both had signs of anthropogenic disturbance, including waste piles. The Green Ash stands have been heavily impacted by Emerald Ash Borer (EAB), and a site visit in December 2015 determined that some of the EAB affected stands were either totally dead or had been cleared. Several Oak-Hickory woodland/savannah native indicator species were noted within the Oak-Hardwood
Deciduous Forest, including Early Goldenrod (*Solidago juncea*), Oldfield Cinquefoil (*Potentilla simplex*), Bastard Toadflax (*Comandra umbellata*), Carolina Rose (*Rosa Carolina*) and several hawthorns (*Crataegus compacta*, *C. macrosperma*).

**Wetlands:**

Four wetland types were present within the Study Area: Graminoid Meadow Marsh, Bulrush Meadow Marsh, Mixed Meadow Marsh, and Cattail Mineral Shallow Marsh. Most of these features occur within depressions within the central-west portion of the Class EA Study Area. These small marsh pockets range in size from 0.007 to 0.17 ha and contained a consistent set of species within drier meadow-marsh and wetter shallow-marsh areas. The most abundant species within these central marshes were Reed Canary Grass (*Phalaris arundinacea*), Narrow-leaved and hybrid Cattail (*Typha angustifolia* and *T. x glauca*) as well as sedges (*Carex spp*), Purple loosestrife (*Lythrum salicaria*) and Common Reed (*Phragmites australis ssp. australis*). No significant wetland species were found in the Class EA Study Area.

**Vascular Plant Inventory**

**Vascular Plant Composition:**

In total, 211 plant species were observed in 2015 and 2019 within the Block 1 BSS Study Area. 101 (48%) of these are native and the remaining 110 (52%) of which are introduced in Ontario. Only a portion of these are found in the Class EA Study Area, and a few that are significant are discussed under mitigation. An additional 24 plants were identified to genus level only because diagnostic characteristics (e.g. flowers or fruit) were not present. A vascular plant list is provided in the EIA (*Appendix E*).

No SAR plants were detected (MECP, 2019; COSEWIC, 2019). One regionally rare species, *Crataegus compacta*, was observed among other hawthorn species. *Crataegus pruinosa* was also observed in the Study Area. This species is taxonomically complex with several varieties. At the time of the surveys in 2019, only fruit could be obtained so it was not possible to confirm which variety(s) were present. These individuals were not observed in flower during the June 2015 surveys, so could not be positively identified at that time. Confirmation would require collection of flowering material in May. (Note that surveys undertaken in 2015 were general botanical surveys, with spring, summer, and fall survey timing in compliance with City of Hamilton EIS guidelines (2015)). The dates that hawthorns flower varies by species and weather conditions in a particular year; dedicated field visits are required to confirm the species. This can be coordinated with the future detailed tree survey which is required by the City.

**Targeted Plant SAR Screening**

The SCUBE West Subwatershed Study (Aquafor Beech Limited, 2013) documented two Endangered plant species: American Columbo (*Frasera caroliniensis*) and Butternut (*Juglans cinerea*). Surveys were conducted for these species; however, they were not detected in 2015 to 2019 field programs. It is possible that individual Butternut trees could occur on residential lots, however, these were not accessible. As such, further surveys would be advisable as part of the tree inventory during detailed design.
Wetlands

As shown in Figure 4.1, six fragmented small meadow and shallow marsh units exist in the Study Area. They are less than 0.2 ha in size. These wetland areas were notably disturbed due to extensive rutting disturbance from agricultural and/or ATV equipment within the marsh units as well as the surrounding fields, and four of these wetlands were mowed in the summer of 2019.

These wetlands are not currently on HCA regulatory mapping. Given the relatively young successional status of these wetland pockets, the role of agriculture in their development, and relative lack of connectivity to other terrestrial features, they do not meet the 0.5 ha regulatory threshold for protection (Dougan & Associates, 2020). Furthermore, they were not included in the NHS recommended in the SCUBE West Subwatershed Study (Aquafor Beech Limited, 2013).

4.3.1.4 Wildlife Resources

Birds

A total of 55 species of birds were detected during the Block 1 BSS breeding bird surveys and other wildlife surveys. Forty-six (46) of these species were considered as possibly breeding. Of these 46 species, most of them were observed within the current Class EA Study Area, and those seen outside of this area have suitable breeding habitat within it so have the potential to be present. The nine species (out of the 55 species total) that were not considered to be breeding within the Block 1 and Class EA Study Area, as they were observed flying over the general areas only, are as follows:

- Canada Goose, Double-crested Cormorant, Great Blue Heron, Green Heron, Turkey Vulture, Ring-billed Gull, Caspian Tern, Rock Pigeon, and Chimney Swift (Threatened; see below for details).

Of the 46 species of potential breeding birds, three of them are considered introduced (non-native): European Starling, House Finch, and House Sparrow. Of the remaining 43 species, three of them are considered SAR: Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*), and Eastern Meadowlark (*Sturnella magna*), which are all designated as “Threatened” at both the federal level (COSEWIC, 2019) and provincial level (MECP, 2019).

At a provincial level, all the 46 native breeding species have been assigned S ranks of either S4 or S5 by the Natural Heritage Information Centre (NHIC, 2019a), which indicates that their provincial populations are “apparently secure” or “secure”, respectively (NHIC, 2019b).

At a local level, 42 of the 46 potentially breeding species are considered common to abundant and widespread in the City of Hamilton (Smith, 2014). The four exceptions, with their status in brackets (per Smith 2014), are as follows: Red-bellied Woodpecker (uncommon; very widespread), Brown Thrasher (uncommon; widespread), Vesper Sparrow (uncommon; widespread) and Eastern Meadowlark (uncommon; scattered). Note that Red-bellied Woodpecker has undergone a recent expansion in numbers and range in southern Ontario, particularly in the Hamilton Region, so its
status should no longer be considered uncommon. No species considered “rare” in the City of Hamilton (per Smith 2014) were detected during field investigations.

The Ontario Ministry of Natural Resources and Forestry (MNRF, 2000) considers three (3) of the species recorded as being area sensitive: Savannah Sparrow, Bobolink, and Eastern Meadowlark. This indicates that the species requires large areas of suitable habitat for its long-term survival and is therefore more sensitive to habitat loss and fragmentation.

The highest level of breeding evidence obtained during the surveys was “confirmed” breeding (OBBA, 2001); this evidence was obtained for three (3) species, either by the presence of fledged young or agitated behavior by adult birds: American Robin, Savannah Sparrow, and Song Sparrow. The next highest level of breeding evidence was “probable” breeding (OBBA, 2001), either by the observation of pairs of birds (code P) or territorial males (code T), which is defined as a singing male being present at the same location at least seven days apart. This evidence was the highest breeding level obtained for 31 species. The next highest level of breeding evidence was “possible” breeding (OBBA, 2001), as seen with singing males (code S) or birds being present in appropriate breeding habitat during the breeding season (code H). This evidence was the highest breeding level for 12 species, with six of these detected singing (S) and six being present in suitable habitat (H), but not singing or displaying territoriality.

Regarding the Migratory Birds Convention Act (MBCA, 1994), 37 of the 46 species recorded as at least possibly breeding are protected by the Act. As such, it means that it is illegal to harm or kill these species, or to harm or destroy their nests and nesting habitat. The nine species detected during field investigations within the Class EA Study Area that are afforded no protection from the Act are Red-tailed Hawk, Blue Jay, American Crow, European Starling, Red-winged Blackbird, Common Grackle, Brown-headed Cowbird, House Finch, and House Sparrow. The Act is enforced through due diligence procedures to avoid interference with the nesting birds.

Species at Risk Birds:

Four (4) birds SAR were detected within or in the vicinity of the Class EA Study Area. These are: Chimney Swift, Barn Swallow, Bobolink, and Eastern Meadowlark. These four species are discussed as follows:

- Chimney Swift – Threatened (federal and provincial); four birds were seen foraging in the open skies over the intersection of Highway 8 and Jones Road on June 3, 2015. This location is over 350 metres from the Class EA Study Area. Note that there are no suitable structures or trees (large, hollow trees, greater than 50 cm DBH) for nesting in the Class EA Study Area and any birds present are likely nesting in surrounding areas only and using the skies over the Class EA Study Area for foraging. Chimney Swifts were not identified during other breeding bird surveys held on May 21, June 12, 2015, and on June 27, 2019. Therefore, it is highly unlikely this species breeds within the Class EA Study Area.

- Barn Swallow – Threatened (federal and provincial); up to four (4) birds were seen during breeding bird surveys in the open fields during the three surveys in 2015 and June 27, 2019. There are numerous buildings along the three major roads defining the Class EA Study Area (i.e., Highway 8, Barton Street East, and Fruitland Road).
that could provide suitable nesting habitat for the species. Therefore, it is likely that these birds are nesting locally and foraging within the Class EA Study Area. However, none of the buildings within or close to the Study Area location had nesting Barn Swallows. Category 3 Regulated Habitat is defined by OMNR (OMNR undated) as foraging habitat within 200 metres of a nest site. Since it is not known exactly where these foraging swallows were nesting, it is not possible to identify which areas (if any) of the Class EA Study Area would constitute Category 3 habitat. However, even with removal of these open areas for the two roads, there will still be substantial amounts of foraging habitat within the Class EA Study Area and surrounding lands (e.g. south of Highway 8). Therefore, it is not anticipated that this relatively small loss of foraging habitat will have a negative impact to nesting Barn Swallows. MECP should be consulted to confirm next steps for ESA compliance regarding this species during the detailed design phase.

- Bobolink – Threatened (federal and provincial); at least four territorial males (i.e., observed at least twice in the same location at least seven days apart) were present in 2015 in open areas to the east and southwest of the Class EA Study Area. No Bobolinks were detected in 2019 in the Class EA Study Area or in adjacent area, even though habitats utilized in 2015 were still present. Although the Bobolinks in 2015 were outside of the Class EA Study Area, there is contiguous habitat within the Class EA Study Area so it is possible that, in the future, Bobolinks could nest in this suitable habitat within the Class EA Study Area. The extent of the contiguous Bobolink habitat (cultural meadow – MEMM4), both within and outside of the Class EA Study Area is shown in Figure 4.2. It is recommended that MECP be consulted to confirm next steps for ESA compliance during detailed design.

- Eastern Meadowlark – Threatened (federal and provincial); two territorial birds were observed in 2015 (June 3 and June 12) in open areas to the east and southwest of the Class EA Study Area. No Eastern Meadowlarks were detected in 2019 in the Class EA Study Area or in adjacent habitats, even though habitats utilized in 2015 were still present. Although the meadowlarks were outside of the Class EA Study Area, there is contiguous habitat within the Class EA Study Area so it is possible that, in the future, they could nest in this suitable habitat within the Class EA Study Area. The extent of the contiguous Eastern Meadowlark habitat (cultural meadow – MEMM4), both within and outside of the Class EA Study Area is shown in Figure 4.2. It is recommended that MECP be consulted to confirm next steps for ESA compliance during detailed design.

Other Species at Risk
This section discusses the other potential SAR that had the potential to be present within the Study Area based on background information.

**American Badger:**
No suitable soils for the presence of American Badger were observed. In addition, no potential burrows were observed that could be attributable to this species, nor were any animals seen on an incidental basis. As such, further surveys for American Badger are not recommended.

**Jefferson Salamander:**
No suitable vernal pools were observed within the Class EA Study Area. In addition, the woodlands are generally not suitable for overwintering for this species due to their lowland character. Given the distance and the intervening habitats from known populations on the Niagara Escarpment to the south, it is highly unlikely that this species exists within the Class EA Study Area. This species requires woodland pools for breeding and upland forest for foraging (outside the breeding season) and overwintering. As such, additional surveys for this species are not recommended.

**Barn Owl:**

No suitable structures for nesting or roosting Barn Owls, such as old barns with large holes to give access to upper beams, were detected within the Class EA Study Area. Also, no Barn Owls were observed during general breeding bird surveys. Therefore, it is not likely that Barn Owl occurs within the Class EA Study Area, and additional surveys are not recommended.

**Endangered Bats:**

Four species of Endangered bats are known from the City of Hamilton: Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*). There is no suitable overwintering habitat (e.g. karst) for any of these four species within the Class EA Study Area, nor any suitable human-made structures for them to roost in (during migration or for breeding). Per the Guelph District MNRF protocol (2017) for identifying suitable maternity roost habitat for these species, there is only a very small amount of suitable deciduous forest at the north end of the Class EA Study Area, where the proposed Gordon Dean Avenue meets Barton Street East. Even here, these woodlands are small, disturbed, and have adjacent residences. Therefore, it is unlikely that Endangered bats form maternity roosts in this area.

There are other suitable trees (snags 10+ cm DBH and maples with dead/living leaf clusters) found within the Class EA Study Area, but they are within cultural thickets or hedgerows, which do not meet MNRF criteria for suitable maternity roost habitat. However, any suitable roost trees in these habitats could be used on a temporary basis (e.g. during migration) by bats, Endangered or otherwise. Removing these isolated roost trees does not require approval per the ESA but, if any are to be removed, it is recommended that they be removed outside of April 1 to October 31 to ensure that there are no bats present that may be inadvertently disturbed, harmed, or killed.

It is recommended that MECP be consulted (via submission of an Information Gathering Form (IGF) regarding next steps to ensure ESA compliance during the detailed design phase.

**Monarch**

This butterfly species could be found in open areas within the Class EA Study Area, both breeding (its hostplant, Common Milkweed, is present) and during migration. However, although the Class EA Study Area is within five kilometres of Lake Ontario and the species is most likely present (especially in the fall), the habitats within the Class EA Study Area and in the surrounding lands (which are residential and agricultural) would not result in significant numbers being present in the Class EA Study Area.
Area (i.e., the numbers present would not meet significance criteria for the Migratory Butterfly Stopover Areas (MNRF 2015)). Also, despite field work being done during this species breeding season, none were observed within the Class EA Study Area in 2015 and 2019. It is recommended that any areas with Common Milkweed should be cleared outside of the breeding season (when chrysalises and/or pupae may be present) and maintained in a cleared function into the restricted breeding period if road construction work is required to be scheduled during this period.

**Snapping Turtle**

This species was not specifically surveyed for in 2015 and 2019 and none were observed on an incidental basis. There are also no records within the NHIC database. However, it is common and widespread within the City of Hamilton. It utilizes a wide range of habitats (including anthropogenic ones, such as roadside ditches), and disperses effectively over terrestrial habitats. As such, this species is probably present periodically in the Class EA Study Area, especially along WC-5.0 5.0, which could serve as a movement corridor. Note that there are no larger wetlands (with basking sites) within the Class EA Study Area. Furthermore, no overwintering habitat (i.e., water at least one metre deep with a muddy substrate) is found within the Class EA Study Area. Finally, no suitable nesting sites (e.g. relatively open areas of sand or gravel with a southerly aspect) were observed in proximity to WC-5.0 (at the proposed crossing of Collector Road ‘B’).

Given that this species moves extensively in terrestrial habitats, it could be present seasonally in the smaller wetland features, or the small dug pond just east of the former Alectra property. Clearing and grading in these areas should avoid the active period (April to October) for this species or employ mitigation measures such as erecting exclusion fencing to ensure turtles are not able to enter active construction areas and be injured or killed, or perform wildlife rescue and relocation efforts (as required). This also applies to construction areas on WC-5.0 which, as outlined above, may be a movement corridor for this species.

Other SAR were also surveyed for using appropriate protocols and not detected (e.g. Eastern Wood-Pewee). The full SAR screening as completed is provided in the EIÂ (Appendix E).

**Incidental Wildlife Sightings**

Western Chorus Frog (*Pseudacris triseriata*) was heard singing from small depressions containing seasonal pools that are in the ATV ‘obstacle course’ located about 80 metres to the north of the Class EA Study Area. At least three frogs of this species were heard on April 29, 2015. This species was also detected in this general area during field work conducted in 2009 (Dillon Consulting 2010). These animals would represent the Carolinian population, which is not currently considered a SAR. This species is considered “common” in the City of Hamilton (Schwetz, 2014a).

Two species of snakes were encountered during the field investigations: DeKay’s Brownsnake (*Storeria dekayi*) and Eastern Gartersnake (*Thamnophis sirtalis*). Both these species have Sranks of S5 in Ontario, indicating that their populations are
“secure” (NHIC 2019a), and are also considered “common” and “abundant”, respectively, in the City of Hamilton (Schwetz, 2014a).

Four species of mammals were detected during the field investigations: White-tailed Deer (*Odocoileus virginianus*), Raccoon (*Procyon lotor*), Gray Squirrel (*Sciurus carolinensis*), and Coyote (*Canis latrans*). All of these species have S ranks of S5 in Ontario, indicating that their populations are “secure” (NHIC 2019a), and are also considered common in the City of Hamilton (Schwetz, 2014b).

4.3.1.5 Significant Features

**Species at Risk Habitat**

The EIA included a SAR screening, which revealed that there are no additional species that warrant further species-specific surveys. The three Endangered or Threatened SAR that were confirmed in the Class EA Study Area during field investigations are: Barn Swallow, Bobolink and Eastern Meadowlark.

**Significant Wildlife Habitat**

The EIA completed a Significant Wildlife Habitat (SWH) screening for the habitats within the Study Area against the habitat criteria found in MNRF (2015) as well as other criteria (e.g. the presence of indicator species). A summary of SWH screening results is provided below:

1. **Seasonal Concentration Areas of Animals:** Not found within the Class EA Study Area.
2. **Rare Vegetation Communities:** Not detected within the Class EA Study Area.
3. **Specialized Habitat for Wildlife:** Not found within the Class EA Study Area.
4. **Habitats for Species of Conservation Concern:** Only one category (Special Concern and Rare Wildlife Species) was identified as Candidate within the Study Area. No Rare or Special Concern species were detected. However, three Special Concern species may be present within the Class EA Study Area: Snapping Turtle, Eastern Ribbonsnake and Monarch.
5. **Animal Movement Corridors:** Not identified within the Class EA Study Area.

**Core Areas**

Core Areas include a) Key Natural Heritage Features, b) Key Hydrologic Features and c) Local Natural Areas. These are discussed below, as they relate to the Study Area:

a) **Key Natural Heritage Features:** These include Significant Habitat of Endangered, Threatened, and Special Concern species, as designated by COSSARO and COSEWIC. Two Threatened species were observed breeding within the Class EA Study Area: Bobolink and Eastern Meadowlark. As such, these habitats would be considered Core Area. Furthermore, the following Key Natural Heritage Features are not present in the Class EA Study Area: Life Science Areas of Natural and Scientific Interest (ANSIs); significant valleylands; sand barrens, savannahs, and tallgrass prairies; and alvars.
b) **Key Hydrologic Features:** These include wetlands and permanent and intermittent streams. Wetlands are defined by City of Hamilton policies as being larger than 0.5 hectares. Although a number of small wetlands are present within the Class EA Study Area, none of them are greater than 0.5 ha so they are not considered Core Areas nor are included within the recommended NHS from Aquafor Beech (2013) and as refined by D&A (2017). WC-5.0 qualifies as a Key Hydrologic Feature. Per Schedule B-5 of UHOP (2013), there are no littoral zones within the Class EA Study Area, and field investigations did not identify any seepage areas or springs.

c) **Local Natural Areas:** No Environmentally Significant Areas (ESA) or ANSIs are in the Class EA Study Area.
Figure 4.1. Vegetation Communities
Figure 4.2. Significant Species
4.3.2 Aquatic Resources

The primary watercourse within the Study Area is WC-5.0, which originates south of the Niagara Escarpment, draining primarily through agricultural areas and residential areas south of the Study Area. The watercourse flows north through the Study Area, and into Lake Ontario, approximately 1.5 kilometres (km) to the north. An aquatic assessment was completed by Wood in the spring of 2020. A summary of the aquatic assessment is provided in this report and details are documented in the Aquatic Assessment Report (Wood, 2020) provided in Appendix F.

4.3.2.1 Aquatic Species at Risk

The potential for aquatic Species at Risk (SAR) and SAR habitat (i.e., candidate) to occur within the Study Area was determined based on a review of the MNRF Natural Heritage Information Center (NHIC) online database (one (1) square kilometre tiles 17PH0585 and 17PH0586) (Ministry of Natural Resources and Forestry, 2020) and Fisheries and Oceans Canada (DFO) online aquatic SAR mapping (Fisheries and Oceans Canada, 2020).

No aquatic SAR were identified within the online databases reviewed for the Study Area. Additionally, no aquatic SAR were observed during the field investigation.

4.3.2.2 Aquatic Ecosystem

Qualified Wood biological staff executed a field investigation on March 19, 2020 on watercourse WC-5.0 at and within the vicinity of the proposed Collector Road ‘B’ crossing. The field investigation included an aquatic habitat assessment within the crossing location as well as upstream and downstream reaches, and a fish community survey including the use of a backpack electrofisher. The habitat assessment included detailed assessment 50 m downstream and 20 m upstream of the crossing, with a general assessment performed for an additional 150 m downstream and 30 m upstream. Approximately 60 m of the watercourse, downstream of the crossing, was not accessible due to private property access limitations. Field conditions were assessed following the Ontario Ministry of Transportation (MTO) Environmental Guide for Fish and Fish Habitat. The fish community survey was conducted using a Halltech backpack electrofishing unit, with one (1) netter, for a total effort of 993 seconds.

No specialized habitat or groundwater upwelling was observed during the field investigation. The defined channel, visible high-water mark along the banks and lack of terrestrial vegetation within the channel suggest that WC-5.0 within the aquatic Study Area is a permanent watercourse, although low flow during drier periods (e.g. summer) are anticipated to impede fish passage and notably limit aquatic habitat. Surveys conducted by Wood near Highway 8, approximately 530 m south (upstream) of the crossing location, independent of this Class EA, documented flow during surveys in summer 2019 and spring 2020, though water depth was low (approx. 0.05 m). The reach of WC-5.0 between Highway 8 and Barton Street, which includes the proposed crossing location, is identified as having permanent flow based on surveys conducted in May 2009 (Dillon Consulting Ltd., 2010) and the Wood observations. Field investigations previously conducted by Wood (October 2017) observed WC-5.0 to be dry near Barton Street, approximately 545 m north of the proposed crossing location,
with flow present in the spring (April 2017). A survey of the watercourse beginning south of Barton Street and continuing downstream (north) to Lake Ontario, identified WC-5.0 as predominantly permanent (Dillon Consulting, 2007).

**Fish and Fish Habitat**

No fish were observed or collected during the Wood 2020 fish community survey, suggesting WC-5.0 provides an indirect fish habitat function. This is consistent with an electrofishing survey completed in May 2009, which did not record any fish (Dillon Consulting Ltd., 2010). Additionally, Wood completed fish community surveys approximately 530 m south of the proposed crossing location in summer 2019 and spring 2020, with no fish recorded.

Potential fish barriers (at least in effect for part of the year) were observed downstream of the study area, and would likely be impassable due to low water level/flow, steep gradient differences in water level elevation, wide and shallow sediment bar zones and large woody debris clogging the channel (refer to Figure 4.3 and Figure 4.4). Trees were present along the banks, providing partial or almost complete shade cover, for the majority of the reach, as well as farther upstream and downstream. In some portions, the treed vegetation along the channel is very narrow due to land use encroachment towards the riparian zone. The riparian vegetation may assist in moderating temperatures within WC-5.0 during the summer months.

**Wood 2020 Habitat Assessment Summary**

**WC-5.0 Downstream of Proposed Crossing Location**

The initial 50 m downstream of the proposed crossing location was comprised of predominantly flat flow morphology, with some runs and riffles also present. The mean measured wetted width and depth were 1.5 m and 0.22 m, respectively. Riffle depth averaged 0.15 m and one (1) pool, with a depth of 0.4 m was present. Substrate comprised of clay (40%), gravel (30%), silt (20%) and cobble (10%). Erosion was present on both banks, but appeared stable, with bank height ranging from approximately 0.5 m to 1.5 m. Herbaceous vegetation and deciduous trees were present along the banks, providing approximately 80% riparian cover. The surrounding riparian area included thicket along the east side of the watercourse, with localized meadow habitat present along the west side for a width ranging from 11 m to 40 m. Residential properties are present west of WC-5.0, with Fruitland Road approximately 65 m to 80 m west of the watercourse (Figure 4.4).

**WC-5.0 Within Proposed Crossing Location**

The approximately 30 m long section of WC-5.0 within the right-of-way for the proposed road crossing, is generally straight with flat and run morphology. The measured average wetted width and depth was 1.4 m and 0.15 m, respectively, with a minimum and maximum depth of 0.04 m and 0.16 m, respectively. Substrate was consistent with rest of the Study Area and was comprised of clay (40%), silt (30%), gravel (25%) and cobble (5%). The approximately 1.3 m high banks contained herbaceous vegetation and deciduous trees, providing approximately 50% riparian cover.

The initial 15 m upstream of the crossing location measured a mean wetted width and depth of one (1) m and 0.07 m, respectively, with flat and riffle morphology, meandering...
slightly to the west. Substrate remained consistent, with a combination of clay (40%), gravel (30%), silt (20%) and cobble (10%). WC- 5.0 then widens, with a wetted width of 3.5 m and depth of 0.15 m to 0.29 m. A potential fish barrier, at least part of the year, is present at this location due to debris, cobble and a small island bar (refer to Figure 4.4; Appendix A, photographs 11 and 12). A circular metal culvert is immediately upstream of this widened portion of the channel, with a diameter and length of 1.3 m and 4.5 m, respectively. Water within the culvert was 0.6 m to one (1) m wide and 0.17 m deep. Herbaceous vegetation and deciduous trees were present along the banks within the section of open channel, providing approximately 50% riparian cover. Minor erosion was evident, with undercut banks on both sides of the culvert. The culvert provides access over Watercourse 5.0, with grass growing on the access path over top the culvert. Fruitland Road is present approximately 85 m west of WC-5.0 along this 20 m section.

For more details on the aquatic assessment, refer to Appendix F.
Figure 4.3. Aquatic Assessment Study Area
Figure 4.4. Aquatic Habitat
4.4 Cultural Environment

4.4.1 Archaeological Resources

A review of the Appendix F-4 (Archaeological Potential) of the UHOP (2013) indicates that archaeological potential exists within the entire Study Area (Figure 4.5). An excerpt of the Appendix F-4 (Archaeological Potential) of the UHOP (2013) is provided below. In addition, a Stage 1 Archaeological Assessment (Jacques Whitford Engineering, Scientific, Planning and Management Consultants, 2007) was completed in February 2007. The findings and recommendations of this assessment were used for Fruitland Road Class EA (January 2011). The report concluded that there is moderate potential for the discovery of archaeological resources in the undisturbed portions of any fields which are currently used for agricultural purposes. It recommended that a Stage 2 Archaeological Investigation will be required prior to any construction activities in undisturbed lands. The Stage 1 Archaeological Assessment is included in Appendix E of the Fruitland Road Class EA available on City of Hamilton’s website: https://www.hamilton.ca/sites/default/files/media/browser/2015-11-05%2014%3A15/fruitland-road-ea-report-phases1-2-appendices.pdf

In addition, the Mountview Gardens Cemetery is located adjacent to the former Alectra lands and encroaches the southern portion of the Study Area.

A Stage 2 Archaeological Assessment was not completed as part of the current study and shall be completed during the detailed design phase.

Figure 4.6. Excerpt from the Urban Hamilton Official Plan (August 2013) - Appendix F-4 (Archaeological Potential)
4.4.2 Built Heritage Resources and Cultural Heritage Landscapes

Appendix F (Cultural Heritage Resources) of the UHOP (2013) indicates that there are no built or cultural landscape heritage areas within the Study Area (Figure 4.7). An excerpt of the Appendix F (Cultural Heritage Resources) of the UHOP (2013) is provided below. In addition, an Information Sheet was completed as part of Phase 1 and 2 (See Fruitland Road Class EA; January 2011). It provided background information on the development history and cultural heritage resources (archaeology, built heritage and cultural heritage landscapes) in the Fruitland Road Class EA (January 2011) study area (both sides of Fruitland Road from Barton Street to Highway 8) and the east of study area (bounded by Fruitland Road to the west, Jones Road to the east, Barton Street to the north and Highway 8 to the south). It noted that no properties within the Study Area have been designated under Part IV of the Ontario Heritage Act. The Information Sheet revealed the following two (2) cultural heritage landscapes within the current Study Area:

- “Remnant fruit farms, orchards, open spaces, fields and tree lines; and
- Fruitland Road, Barton Street and Jones Road as former rights-of-way associated with the original survey of the Township of Saltfleet”.

Although these cultural heritage landscapes are important, the changes in the landscape over the years has changed their form and function. Since the Study Area is within an area projected to become urbanized, the landscape will be further compromised as it changes from rural to urban.

![Figure 4.8. Excerpt from the Urban Hamilton Official Plan (August 2013) - Appendix F (Cultural Heritage Resources)](image)

4.5 Drainage

The primary watercourses within the Study Area is WC-5.0, which originates on the Niagara Escarpment, draining north from Highway 8 joining with two smaller tributaries. Portions of WC-5.0 have been significantly altered to accommodate surrounding land uses. The watercourse is a permanently flowing system with habitat indicative of
degraded, warm water systems. A tributary to WC-5.0 drains northerly into a storm sewer at Barton Street. The online storm sewer significantly limits the potential for this watercourse to function as indirect habitat due to the physical and hydraulically separated reaches.

WC-5.0 between Fruitland Road and Barton Street has been described in detail in the 2013 SCUBE report. The channel is described as exhibiting a more natural form (compared to downstream reaches) and is described as moderately stable. The channel has access to its floodplain, and a wide riparian corridor. Private channel treatments are intermittent along the reach; however, the majority of the banks are untreated and allowed to adjust naturally (SCUBE 2013).

WC-5.0 enters Block 1 through a box culvert (3 m span by 1 m rise) crossing under Fruitland Road; this culvert is located approximately 215 meters north of Highway 8. The watercourse continues running adjacent to the east side of Fruitland Road, within a significantly altered channel which runs through private property. This section of the watercourse is crossed by a series of structures located on private property. WC-5.0 will cross the proposed Collector Road ‘B’ via a span culvert being proposed as part of this Study. Details of the proposed culvert are provided in Section 5 of this report. WC-5.0 exits the Block 1 study area, after crossing under Barton Street through a closed box culvert (1.28 m span by 1.05 m rise).

The ongoing BSS for Block 1 Area will propose stormwater management facilities for the future development within the Block 1 area, which will provide improved stormwater quality and quantity handling, including implementation of some LID techniques. Surface runoff from proposed roads proposed through this study will drain into catchbasins connected to the stormwater system, outletting to future stormwater management facilities. As such, the stormwater management recommendations from the Block 1 BSS shall be incorporated during the detailed design phase of Gordon Dean Avenue and Collector Road ‘B’ when the BSS for Block 1 Area information becomes available.

4.6  Groundwater and Source Water Protection

4.6.1  Groundwater

A hydrogeological assessment was initiated as part of the ongoing Block 1 BSS to study the impacts on the existing water table and aquifers. The main findings included:

- The existing subsurface contains low permeability shale and is a poor aquifer;
- Identified a concern over the high groundwater level (1-1.5 m) in some areas; and
- Overall, the amount of infiltration in the area is expected to decrease due to new surface paving and new buildings.

The surface topography is relatively flat with a gentle slope down towards the north, generally following the bedrock topography. Drainage in the Study Area largely reports to watercourse WC-5.0 flows from south to north along the west edge of Block 1.

Block 1 is located within the Iroquois Plain Physiographic Region of Southern Ontario, a lowland bordering Lake Ontario which was occupied by Lake Iroquois during the period when the last glaciation was receding but remained in the St. Lawrence Valley. The
region of the Iroquois Plain to the west of Grimsby is characterized by heavy textured, low permeability soil developed on red clay derived from the underlying Queenston Formation. The Queenston Shale is generally compact and dense with poor pore space interconnectivity and poor water yielding capabilities.

Data obtained from water well records indicate a fairly wide range of transmissivity values with 10 and 90 percentile values ranging between 0.5 and 27.9 m²/day respectively. In general, only the weathered zone in the upper 3 to 5 m of the shale provide sufficient water supplies for domestic use.

The bedrock slopes down towards Lake Ontario from approximately 92 m asl in the vicinity of Regional Road 8 to approximately 85 m asl in the vicinity of Barton Street. For comparison, the ground surface elevation varies from 93 to 88 m asl, indicating that the overburden is approximately 1 to 3 m thick.

Block 1 where Gordon Dean Avenue and Collector Road ‘B’ are located, is identified as being an area of shallow bedrock, with some outcropping at or near ground surface, however the surficial soil of the surrounding area is identified as Halton Till: clayey silt-clay till, which is in agreement with the observations from boreholes drilled as part of the current field program. During drilling on the site, bedrock was found to occur at depths from 1.0 to 2.2 m below ground surface.

At the time of preparation of this ESR, the Hydrogeological Assessment Report in support of the BSS for Block 1 was not yet finalized. As such, the relevant recommendations from the Hydrogeological Assessment Report for the ongoing BSS shall be incorporated during the detailed design phase of Gordon Dean Avenue and Collector Road ‘B’ when the BSS for Block 1 Area information becomes available.

A total of 18 wells are located within Block 1, of which 2 are recent 2” diameter plastic monitoring wells and the remainder being 6” diameter water wells drilled in the 1950’s, primarily for domestic water supply. These wells are assumed to be abandoned if not still in use. The domestic water wells are primarily associated with residences located along the roads at the perimeter of the block and were generally drilled into the shale bedrock at depths of about 8 to 16 m below ground surface. According to the well records, the wells generally yielded fresh water at flow rates of about 9 to 23 L/min. It is unlikely that these wells are in current use for domestic water supply as the area is serviced by the municipal water supply system.

It is anticipated that as a due diligence measure, and pending details of the above noted BSS for Block 1 Area Hydrogeological Report, a private well survey should be completed within 500 m of Study Area as a preconstruction activity to establish the presence of any active wells that are present nearby, and the quality and quantity of the water produced by these wells, as well as an assessment of the conditions of these wells. Any well complaints received during the course of the road construction should be investigated by a qualified professional and recommendations generated on the potential source of the well complaint and recommendations on how to address the issue (if required).
4.6.2 Source Water Protection

The Clean Water Act, 2006 is intended to protect existing and future sources of drinking water. Under this legislation, various vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a Source Protection Area. These vulnerable areas are delineated in the Assessment Reports and include: Significant Groundwater Recharge Areas; Highly Vulnerable Aquifers; surface water Intake Protection Zones; and Wellhead Protection Areas. Source Protection Plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

The Study Area is located in Hamilton Region Source Protection Area and is subject to the policies of the Source Protection Plan for the Halton Region and the Hamilton Region Source Protection Areas (Halton-Hamilton Source Protection Committee, 2017a). MECP’s Source Protection Information Atlas (Ministry of the Environment, Conservation and Parks, 2020) was reviewed to identify if the Study Area is situated in any vulnerable areas. The results of this review are provided below:

4.6.2.1 Significant Groundwater Recharge Areas

Significant Groundwater Recharge Areas are areas where there is a high volume of water moving from the surface into the ground, recharging aquifers. This water can include dissolved chemicals that the runoff has accumulated.

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

4.6.2.2 Highly Vulnerable Aquifers

Highly Vulnerable Aquifers are defined as subsurface, geologic formations that are sources of drinking water which could, relatively easily, be impacted by the release of pollutants on the ground surfaces. A significant part of the Hamilton Source Protection Area contains Highly Vulnerable Aquifers. Within much of this area, the water table is shallow, the overburden is thin and permeable (or absent), and the aquifer is located in fractured bedrock (Halton-Hamilton Source Protection Committee, 2017b).

The Study Area is located within an area of Highly Vulnerable Aquifers.

4.6.2.3 Intake Protection Zone

Intake Protection Zones (IPZs) are areas around an intake pipe in a lake or river that draws in surface water used to supply a municipal drinking water system. Three IPZs have been established based on the amount of time that it could take any material or contaminant spilled in or near a lake, river or stream to flow downstream and get to the intake (Halton-Hamilton Source Protection Committee, 2017b). These IPZs are assigned vulnerability scores to reflect the susceptibility of the intakes to contaminants. The vulnerability score for each IPZ is assigned based on the following criteria (Stantec Consulting Ltd., 2007):

- Low vulnerability: (≤5);
- Medium vulnerability: (5-6); and
High vulnerability: (>6).

The Hamilton Drinking Water System is comprised of six (6) subsystems (City of Hamilton, 2019). The Study Area is located within the Woodward Avenue Drinking Water Subsystem. This subsystem is comprised of three (3) intake pipes drawing raw water from Lake Ontario. An area designated as IPZ-2 overlaps with a very small portion of the proposed Collector Road B, east of Fruitland Road (less than 50 metres of overlap compared to around 520 metres long east-west proposed road from Fruitland Road to future Gordon Dean Avenue). This IPZ-2 has been assigned a vulnerability score of 4.8 (Halton-Hamilton Source Protection Committee, 2017b). The assigned vulnerability score of 4.8 indicates that activities undertaken within this zone are of low risk to the municipal water source.

It has therefore been concluded that, given the overlap of a very small portion of the Study Area within the IPZ-2, and with the implementation of the standard construction environmental protection measures described in Section 7 of this ESR, the Study activities are not anticipated to have an impact on the Woodward Avenue Drinking Water Subsystem water intakes.

4.6.2.4 Wellhead Protection Areas

Wellhead Protection Areas are the areas of land around municipal wells where land use activities have the greatest potential to affect the quality of water flowing into the well. Activities undertaken in these areas may release pollutants that could seep into the soil and contaminate the groundwater accessed by both domestic and municipal wells.

The Study Area is not located within a Wellhead Protection Area.

4.7 Air Quality

An Air Quality Assessment was not undertaken as part of this Study relative to the road development occurring within a planned area of land use development. It is recommended that further review of air quality considerations be completed during the detailed design phase to assess the short-term impacts of the roadway Project development on air quality.

4.8 Noise

A Noise Assessment was not undertaken as part of this Study. The operational noise impact will be addressed by a noise study to be completed during the detailed design in coordination with the land use development planning in Block 1.

4.9 Fluvial Geomorphology

A fluvial geomorphological assessment was completed in support of the Block 1 BSS to determine the erosion hazard limits and document characteristics of WC-5.0 and watercourse 6.0. The objective of this assessment was to minimize erosion and ensure stability and health of the watercourses. This assessment was completed for the Block 1 BSS, which include both WC-5.0 and 6.0 in the Study Area.
For this study, only information related to WC-5.0 is relevant given the crossing requirements of Collector Road ‘B’. The general channel characteristics of WC-5.0 are provided in Table 4.4.

<table>
<thead>
<tr>
<th>Channel Characteristics</th>
<th>WC-5.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bankfull Width (m)</td>
<td>3.2 – 4.9</td>
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<tr>
<td>Maximum Bankfull Depth (m)</td>
<td>0.52 – 1.48</td>
</tr>
<tr>
<td>Entrenchment Ratio</td>
<td>&gt;2</td>
</tr>
<tr>
<td>Gradient</td>
<td>Low</td>
</tr>
<tr>
<td>Sinuosity</td>
<td>Straight</td>
</tr>
<tr>
<td>Bank Height (m)</td>
<td>0.5 – 1.48</td>
</tr>
<tr>
<td>Bank Angle (degrees)</td>
<td>30 - 50</td>
</tr>
</tbody>
</table>

WC-5.0 enters the Study Area at Fruitland Road through a 3.1 m wide and 1.0 m high concrete box culvert and is considered a permanent fish habitat.

Preliminary belt width based on aerial imagery interpretation of existing and historic meander planforms, as well as local site observations was determined to be 21 m for WC-5.0. A factor of safety representing 20% of the preliminary width was then applied to the channel to arrive at final meander belt width of 25 m for WC-5.0. Final erosion hazard limits were established with the addition of a 6-m access allowance on each side of the final meander belt width and is 37 m for WC-5.0.

At the time of preparation of this ESR, the Fluvial Geomorphological and Meander Belt Width Assessment was not yet finalized. As such, any relevant final recommendations from the Fluvial Geomorphological and Meander Belt Width Assessment for the ongoing Block 1 BSS shall be incorporated during detailed design phase of Gordon Dean Avenue and Collector Road ‘B’ when the BSS for Block 1 Area information becomes available. Nonetheless the fundamental diagnostic information to characterize the watercourse in relation to Collector Road ‘B’ crossing is documented herein for the purposes of this assessment.
5.0 Development and Evaluation of Alternative Design Concepts

As part of Phase 3 of the Class EA process, an evaluation of alternative design concepts was completed. A combination of four road alignment options (and sub options) were evaluated to address future growth within the Block 1 development area of the SCUBE. The evaluation process represents a significant milestone of Phase 3 of the Class EA process which examines potential road design options based on a set of natural, social, technical and economic criteria. As a result of discussions that occurred with the City of Hamilton and the Fruitland – Winona Development Group on May 27, 2019 and the corresponding comments received from the City of Hamilton on June 10, 2019, the evaluation criteria developed for this assessment were modified to reflect a more robust assessment of the community’s natural heritage features, as well as changes to planned land uses within the Study Area.

The preliminary Gordon Dean Avenue alignment options (4a or 4b) were generated from the initial two phases of the Class EA process in which the City of Hamilton recommended that through trucks utilize a new north-south road (i.e. Gordon Dean Avenue), east of existing Fruitland Road between Highway 8 and Barton Street, and that the existing section of Fruitland Road remain open. The development of the alternatives was based on the alignments approved by City Council through the Fruitland-Winona Secondary Plan in 2014. While reviewing the approved alignment options from the Fruitland-Winona Secondary Plan, additional roadway alternatives were developed based on land availability and other variables.

The sequential evaluation of alternatives that was undertaken as part of the Study is explained below.

5.1 Preliminary Evaluation of Alternatives (2017)

During the preliminary stages of the Study, a set of evaluation criteria and alternatives were assessed and presented to the public during PIC #1. The initial evaluation criteria for the alternative configuration and evaluation of horizontal alignments included the following categories:

- **Engineering**: Transportation Network Safety, Transportation Network Connectivity, Traffic Operations, Vehicle Speeds, Hydraulics and Hydrology Impacts (Creeks);
- **Financial**: Overall Construction and Maintenance Cost, Utility Relocation, Property Acquisition;
- **Socio-Economic Environment**: Conformance to Land Use Plans, Residential / Business Access and Displacement, Emergency Services, Noise Levels Impacts, Archaeological, Built Heritage and Cultural Landscape Impacts and Agricultural Impacts; and
- **Natural Environment**: Wildlife Impacts, Vegetation Impacts and Watercourse and Aquatic Environment Impacts.

Two alignment alternatives (Straight and Curved Alignment) were analyzed, both of which were based on the recommendation of the Fruitland Road Class EA (January 2011; Figure 1.2). Alternative 2 (Curved Alignment) was chosen as the preliminary preferred alignment.
An alternative evaluation of cross sections was also completed early in the Study and presented to the public during PIC #1. The evaluation criteria included:

- Transportation Network Safety;
- Meets City of Hamilton Design Standards, Pedestrian Needs, Cyclist Needs;
- Transit Compatible;
- Adequate Space for Utilities, Streetscaping;
- Overall Construction and Maintenance Cost;
- Utility Relocation;
- Property Acquisition;
- Compatible with Adjacent Land Uses (Current and Future); and
- Residential/Business Access and Displacement.

Three cross section alternatives (two lane, three lane and four lane) were analyzed and the preferred alternative resulted in an alternative of 1-2 lanes.

The intersection configuration at Gordon Dean Avenue and Collector Road ‘B’ was determined based on the detailed design concept discussions with the City of Hamilton. Preliminary discussions with the City of Hamilton during the April 19, 2018 and July 23, 2018 meetings indicated the desire for a roundabout option to be evaluated (Refer to Section 3.5.1.1). The Fruitland – Winona Secondary Plan Transportation Classification Plan (Map B.7.4-3) identified a potential roundabout at the intersection of Gordon Dean Avenue and Collector Road ‘B’. The design including the roundabout is identified as Option 1b. The roundabout design was eliminated based on discussions held with the City of Hamilton and the Project Team in 2018 (Refer to Section 3.5.1.1). The roundabout alternative was dismissed due to concerns with pedestrian traffic safety while walking to and from the proposed park lands in the north east quadrant.

Regarding the controlled intersection itself, concerns were raised with the angle of intersection, as such, due to safety concerns, Option 1b was removed and not included in the evaluation of alternative design concepts (Section 5.4).

Based on feedback primarily from the City of Hamilton, a more rigorous assessment was undertaken to specifically revisit and address the design aspects. Given the safety considerations related with the alignment with particular emphasis on the Gordon Dean Avenue, Collector Road ‘B’ intersection, several modified and additional alternatives were developed to carry forward under a re-evaluation study in 2019.

5.1 Refined Evaluation of Alternatives (2019)

5.1.1 Evaluation Criteria

Advancing a re-evaluation of alternatives also included the need to establish additional modified evaluation criteria. The refined evaluation criteria that supported the evaluation of alternatives (also called options/routes), is provided in Table 5.1. The evaluation criteria align with those previously developed by the City of Hamilton for other similar projects and were collectively discussed in various meetings in 2019 (Refer to Section
3.5.1.1), including the TAC meeting. These criteria as applied in the evaluation were ultimately presented to the public and stakeholders at PIC #2.

<table>
<thead>
<tr>
<th>Component</th>
<th>Evaluation Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Environment</td>
<td>NHS: Core Areas, including Significant Woodlands, PSWs</td>
<td>Potential impacts to terrestrial habitat features.</td>
</tr>
<tr>
<td></td>
<td>NHS: Linkages, Restoration Areas, and Vegetation Protection Zones</td>
<td>Potential impacts to terrestrial habitat features.</td>
</tr>
<tr>
<td></td>
<td>Avian SAR</td>
<td>Amount of habitat loss to Bobolink, Eastern Meadowlark and Barn Swallow Habitat.</td>
</tr>
<tr>
<td></td>
<td>Wetlands</td>
<td>Potential impacts to wetlands in Core Areas.</td>
</tr>
<tr>
<td></td>
<td>Non-Core Area Woodlands</td>
<td>Potential impacts to non-core area woodlands.</td>
</tr>
<tr>
<td></td>
<td>Hedgerows and Thickets</td>
<td>Potential impacts to impacts to hedgerows and thickets.</td>
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<tr>
<td></td>
<td>Avian and Wildlife Resources</td>
<td>Potential impacts to impacts to avian and wildlife resources.</td>
</tr>
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<td></td>
<td>Candidate Significant Wildlife Habitat (SWH)</td>
<td>Potential impacts to SWH.</td>
</tr>
<tr>
<td></td>
<td>Watercourses</td>
<td>Potential impacts to WC-5.0. (i.e. move, alter, reconfigure, enhance WC-5.0).</td>
</tr>
<tr>
<td></td>
<td>Groundwater Impacts</td>
<td>Potential impacts to ground water quality and/or quantity.</td>
</tr>
<tr>
<td></td>
<td>Hydraulics &amp; Hydrology</td>
<td>Potential impacts to flood potential.</td>
</tr>
<tr>
<td></td>
<td>Stormwater Management and Low Impact Development (LID)</td>
<td>Potential impacts to stormwater quality or quantity.</td>
</tr>
<tr>
<td>Socio-Economic Impacts</td>
<td>Residential Impacts</td>
<td>Number of residents displaced, and amount of residential property required.</td>
</tr>
<tr>
<td></td>
<td>Business Impacts</td>
<td>Number of business displaced, and amount of commercial property required.</td>
</tr>
<tr>
<td></td>
<td>Noise Level Impacts</td>
<td>Potential noise impact to residents/business.</td>
</tr>
<tr>
<td></td>
<td>Access to Community Services</td>
<td>Potential impact to access community services.</td>
</tr>
</tbody>
</table>
### Table 5.1. Evaluation Criteria for Alternatives

<table>
<thead>
<tr>
<th>Component</th>
<th>Evaluation Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreational Features Impacts</td>
<td>Potential impact to recreational features (i.e. removal of features or improved access).</td>
<td></td>
</tr>
<tr>
<td>Archaeological Impacts</td>
<td>Potential adverse effects on archaeological features.</td>
<td></td>
</tr>
<tr>
<td>Cultural / Built Heritage Features / Landscapes Impacts</td>
<td>Potential adverse effects on cultural heritage features.</td>
<td></td>
</tr>
<tr>
<td>Impacts to Non-Participating Lands</td>
<td>Potential for acquisition.</td>
<td></td>
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<tr>
<td>Conforms to Secondary Plan</td>
<td>Conformance to Secondary Plan.</td>
<td></td>
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<tr>
<td>Ease of Implementation</td>
<td>Potential challenges to implementation.</td>
<td></td>
</tr>
<tr>
<td>Estimated Capital Costs</td>
<td>Capital costs of the proposed improvements.</td>
<td></td>
</tr>
<tr>
<td>Pedestrians- Safety, walking environment, encourages walking</td>
<td>Characteristics of pedestrian facilities provided.</td>
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<tr>
<td>Cycling Infrastructure</td>
<td>Type of cycling infrastructure provided.</td>
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<tr>
<td>Transit Supportive Development</td>
<td>Ability to support future transit and amount of ridership potential.</td>
<td></td>
</tr>
<tr>
<td>Incorporates innovative products / practices</td>
<td>Number of innovative products or practices incorporated.</td>
<td></td>
</tr>
<tr>
<td>Truck Operations (2 lanes)</td>
<td>The required curb radius to accommodate truck traffic.</td>
<td></td>
</tr>
<tr>
<td>Truck Operations (4 lanes)</td>
<td>The required curb radius to accommodate truck traffic.</td>
<td></td>
</tr>
<tr>
<td>Drivers - Capacity, speed, intersection operations</td>
<td>Potential delay at intersections.</td>
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<tr>
<td>Sight Distance Checks</td>
<td>Potential obstructions.</td>
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<tr>
<td>Overall Safety</td>
<td>Potential safety risks.</td>
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</tr>
</tbody>
</table>

Further details can be found in the Evaluation of Alternatives Memo provided in Appendix G.

#### 5.1.2 Evaluation Methodology

The evaluation methodology included reviewing technical information compiled for the ongoing Block 1 BSS and for this Study to determine the impact on the alternatives presented. The evaluation process examined the potential road alignment options based on a set of natural, social, technical and economic criteria as noted above. This
second round of evaluation or reevaluation of alternatives underwent two iterative reviews by the City of Hamilton, as a result of discussions that occurred with the City of Hamilton.

First Round of Review:

The re-evaluation of alternatives was first submitted to the City of Hamilton on May 22, 2019. The first round of review was based on the meetings held with the City of Hamilton on March 7 and 27, 2019 (Refer to Section 3.5.1.1) and resulted in formal comments received from the City of Hamilton on June 10, 2019. Subsequently, a follow-up meeting was arranged with the City of Hamilton on June 27, 2019 (Refer to Section 3.5.1.1) to further discuss the City of Hamilton’s recommendations regarding the evaluation table and further explain the comments submitted on June 10, 2019.

Second Round of Review:

The evaluation of alternatives was modified to address the City of Hamilton’s recommendations and was resubmitted to the City of Hamilton for their review on August 12, 2019. Following the resubmission of the evaluation table, the City of Hamilton provided the second review of comments on September 6 and 16, 2019. This was followed by the TAC meeting on October 10, 2019 to discuss the comments that were submitted. At the TAC meeting, it was collectively decided that the evaluation of alternatives was suitable to present at PIC #2 and that the comments received on September 6 and 16 could be addressed in the final ESR documentation.

The last round of review resulted in the evaluation criteria reflecting a more robust assessment of the area’s natural heritage features within the Study Area.

The comments received from the City of Hamilton can be found in Appendix C. Further details can be found in the Evaluation of Alternatives Memo provided in Appendix G.

5.2 Development of Alternative Design Concepts

The development of alternative design concepts was completed with consideration given to the characteristics of and constraints within the Study Area.

5.2.1 Alignments

The alignment options were generated based on the recommendations of the Fruitland Road Class EA (January 2011) in which the City of Hamilton recommended that through trucks utilize a new north-south road (i.e., Gordon Dean Avenue), east of existing Fruitland Road between Highway 8 and Barton Street, and that the existing section of Fruitland Road remain open. The development of the alternatives was based on the alignments approved by City of Hamilton Council through the Fruitland-Winona Secondary Plan in 2014. While reviewing the approved alignment options from the Fruitland-Winona Secondary Plan, additional roadway alternatives were developed based on land availability and other variables. As outlined in Table 5.2, a total of seven (7) alternative alignments were developed.
### Table 5.2. Alignment Alternatives for Gordon Dean Avenue and Collector Road ‘B’

<table>
<thead>
<tr>
<th>Alignment Alternatives</th>
<th>General Description</th>
</tr>
</thead>
</table>
| **Option 1a – West of former Alectra Lands** | - North-south road (Gordon Dean Avenue) would run west of the former Alectra lands.  
- East-west road would run east from Fruitland Road with curved sections in the west. |
| **Option 2a – Traverse Western Portions of former Alectra Lands. East-West Road runs parallel to Barton Street** | - North-south road (Gordon Dean Avenue) would traverse western and northern sections of former Alectra lands.  
- East-west road would align with Sherwood Park Road at Fruitland Road. |
| **Option 2b - Traverse Western and northern Portions of former Alectra Lands + Modified East-West Road** | - North-south road (Gordon Dean Avenue) would traverse western and northern sections of former Alectra lands.  
- East-west road would run slightly north of Option 2a from Fruitland Road. |
| **Option 3a - Traverse Central and Eastern Portions of former Alectra Lands. East-West Road runs parallel to Barton Street** | - North-south road (Gordon Dean Avenue) would traverse central and eastern sections of former Alectra lands, including the existing commercial building.  
- East-west road would align with Sherwood Park Road at Fruitland Road. |
| **Option 3b - Traverse Central and Eastern Portions of former Alectra Lands + Modified East-West Road** | - North-south road (Gordon Dean Avenue) would traverse central and eastern sections of former Alectra lands, including the existing commercial building.  
- East-west road would run slightly north of Option 3a from Fruitland Road. |
| **Option 4a – East of former Alectra Lands. East-West Road runs parallel to Barton Street** | - North-south road (Gordon Dean Avenue) would run mostly east of the former Alectra lands.  
- East-west road would align with Sherwood Park Road at Fruitland Road. |
| **Option 4b – East of former Alectra Lands + Modified East-West Road** | - North-south road (Gordon Dean Avenue) would run mostly east of the former Alectra lands.  
- East-west road would run slightly north of Option 4a from Fruitland Road. |

Further details can be found in the Evaluation of Alternatives Memo provided in **Appendix G**. Details of the alternative plan views are provided in Figures 5.1 to 5.7. It should be noted that the segment of Collector Road ‘B’ between Gordon Dean Avenue and Jones Road is included in these figures as the alignment of the road was required in its entirety to support the design development for alternative evaluation. This segment of road is not included as a formal component of this Study.
5.2.2 Intersections

In consideration of the safety concerns associated with the alignments derived at intersection at Gordon Dean Avenue and Collector Road ‘B’, the City of Hamilton confirmed that the intersection must be designed at a 85°-90° angle. Accordingly, alternatives identified in Table 5.2. reflect the consideration of this design constraint.

Further details can be found in the meeting minutes with the City, found in Appendix C.
Figure 5.1: Alternative Alignment Option 1a

Legend
- Proposed ROW
- Property Boundary
Figure 5.2: Alternative Alignment Option 2a
Legend

- Proposed ROW
- Property Boundary

Figure 5.3: Alternative Alignment Option 2b
Figure 5.4: Alternative Alignment Option 3a
Figure 5.5: Alternative Alignment Option 3b
Figure 5.6: Alternative Alignment Option 4a

Legend
- Proposed ROW
- Property Boundary
Figure 5.7: Alternative Alignment Option 4b
5.3 Evaluation of Alternative Design Concepts

The evaluation criteria provided in Table 5.1 were applied to evaluate the seven (7) alignment alternatives as presented in Table 5.2. Based on the results of the evaluation process, the new Alternative 4b was chosen as the preferred alignment for the Gordon Dean Avenue and the Collector Road ‘B’. It should be noted, and to avoid any confusion, that although this Alternative has a similar name as the preliminary preferred alternative documented in 2017, with the modified re-evaluation as described above in Section 5.2, Alternative 4b as selected in 2019 now represents a different alignment.

5.3.1 Preferred Alignment

Alternative 4b was chosen as the preferred alignment for the following reasons:

- It addresses the problem and opportunity statement identified in Fruitland Class EA (January 2011) i.e., it includes a new north-south road east of Fruitland Road from Barton Street to Highway 8 (Gordon Dean Avenue) to relocate the truck traffic from Fruitland Road;
- Impacts to the natural environment can be mitigated;
- Conforms to the Fruitland-Winona Secondary Plan, both in north-south and east-west corridor alignments;
- Avoids the need to displace existing businesses and planned civic uses on the former Alectra lands, will generally facilitate implementation and is cost-effective given the limited number of residential acquisitions (2) required along Highway 8;
- Reduces the noise level impacts to planned residential development relative to other alternatives; Promotes sustainability by accommodating pedestrian and cycling infrastructure as well as improvements that will enhance transit services; and
- Designed to exceed the City of Hamilton’s design standards while performing at acceptable LOS. Based on City of Hamilton’s input, the intersection of Gordon Dean Avenue and Collector Road ‘B’ has been designed at a 90° angle. The preferred road option will operate in an acceptable and safe manner relative to guidelines and road user expectations.

The Preferred Alternative will also safely accommodate future growth and increased traffic in the Block 1 development. The evaluation of alternative alignments is summarized in Table 5.3.
### Table 5.3. Evaluation of Alignment Alternatives

<table>
<thead>
<tr>
<th>Environment Impacts</th>
<th>Category and Criteria</th>
<th>Indicators</th>
<th>Route 1a</th>
<th>Route 2a</th>
<th>Route 2b</th>
<th>Route 3a</th>
<th>Route 3b</th>
<th>Route 4a</th>
<th>Route 4b</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Avian (SAR)</strong></td>
<td>Poor</td>
<td>Direct impacts likely to significant NHS resources</td>
<td>Poor</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Excellent</td>
<td>No direct impacts to terrestrial habitat features anticipated</td>
<td>Excellent: - The Block 1 area is subject to an approved Secondary Plan where urban development will occur. This development will create secondary impacts related to noise, light, changes to surface water runoff, presence of domestic pets, and introduction of residential, commercial and institutional uses that will dominate activities in the Secondary Plan area outside of the protected NHS.</td>
<td>Neutral: - Direct impacts likely to terrestrial habitat features. Mitigation and/or compensation possible through enhancements to areas that will be protected within the NHS, including Linkages, Vegetation Protection Zones (VPZ), and Restoration Areas (RA).</td>
</tr>
<tr>
<td>Wetlands</td>
<td>Poor</td>
<td>Direct impacts likely to terrestrial habitat features; mitigation and/or compensation likely</td>
<td>Poor</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Excellent</td>
<td>No direct impacts to terrestrial habitat features anticipated</td>
<td>Excellent: - Barn Swallow: habitat removal and activities within Category 3 habitat per MNRF General Habitat Description (GHD). This is foraging habitat from five (5) to 200 metres from active nests. No nests were found within or adjacent to the locations of the seven road alternatives. Barn Swallows were seen foraging over many areas within the Block 1 lands, so it is likely there are nests within 200 metres. - Bobolink and Eastern Meadowlark: Low impacts – less than four (4) hectares of suitable habitat being removed; as both species are area sensitive, four hectares is the minimum amount of compensation lands per the Endangered Species Act (ESA). Any amount removed for the road corridors that is less than this amount will be 'rounded up’ to four hectares from a compensation perspective.</td>
<td>Neutral: - Significant impacts to wetlands inCore Areas. Mitigation and/or compensation possible through enhancements to areas that will be protected within the NHS, including Linkages, Vegetation Protection Zones (VPZ), and Restoration Areas (RA).</td>
</tr>
<tr>
<td>Non-Core Area Woodlands</td>
<td>Poor</td>
<td>Direct impacts to non-core area woodlands, however there are few mitigation and/or compensation opportunities</td>
<td>Poor</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Excellent</td>
<td>No impacts to non-core area woodlands</td>
<td>Excellent: - The only area that is impacted by the road alternatives is a small area within the Fresh-Moist Oak-Hardwood Deciduous Forest (FODM9-6) at the north end of the Study Area. This was not included in the recommended NHS due to its small size and isolated location. The amount of this habitat directly impacted by the road alternatives varies from 0.11 to 0.12 ha.</td>
<td>Neutral: - Medium impacts pertain to wetlands of less than 0.5 hectares. Wetland loss could be compensated by creating new wetlands in linkage areas, Restoration Areas, VPZs, etc.</td>
</tr>
<tr>
<td>Hedgerows and Thickets</td>
<td>Poor</td>
<td>Direct impacts to hedgerows and thickets, however there are few mitigation and/or compensation opportunities</td>
<td>Poor</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Excellent</td>
<td>No impacts to hedgerows and thickets</td>
<td>Excellent: - The amount of hedgerow lost for each of the seven road alternatives varies from 0.4 to 0.7 hectares; the amount of shrub thicket lost for each of the seven road alternatives only varies from 0.51 to 0.68 hectares. With regard to mitigation, thicket can be created in future linkages, RAs, and VPZs.</td>
<td>Neutral: - Direct impacts to hedgerows and thickets, however there are few mitigation and/or compensation opportunities</td>
</tr>
<tr>
<td>Avian and Wildlife</td>
<td>Poor</td>
<td>Direct impacts to avian and wildlife resources; however there are few mitigation and/or compensation opportunities</td>
<td>Poor</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Excellent</td>
<td>No impacts to avian and wildlife resources</td>
<td>Neutral: - The categorization of impacts to avian and wildlife resources follows that of “Terrestrial Habitat Features”.</td>
<td>Neutral: - The categorization of impacts to avian and wildlife resources follows that of “Terrestrial Habitat Features”.</td>
</tr>
</tbody>
</table>
Table 5.3. Evaluation of Alignment Alternatives

<table>
<thead>
<tr>
<th>Category and Criteria</th>
<th>Indicators</th>
<th>Route 1a</th>
<th>Route 2a</th>
<th>Route 2b</th>
<th>Route 3a</th>
<th>Route 3b</th>
<th>Route 4a</th>
<th>Route 4b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>compensation opportunities</td>
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<td>Neutral</td>
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<tr>
<td></td>
<td>Direct impacts to avian and wildlife resources, however mitigation and / or compensation possible</td>
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<td></td>
<td>Excellent</td>
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<td></td>
<td>No impacts to avian and wildlife resources</td>
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<tr>
<td>Candidate Significant Wildlife Habitat (SWH)</td>
<td>Permanent removal of SWH and/or few or no mitigation opportunities</td>
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<td></td>
<td>Minimal impacts to SWH; readily replicated, mitigation opportunities within final NHS</td>
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<tr>
<td></td>
<td>No impacts to SWH</td>
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<tr>
<td>Watercourses</td>
<td>Moved, altered, reconfigured, enhanced watercourses; eliminated, few mitigation opportunities</td>
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<td></td>
<td>Excellent</td>
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<td></td>
<td>Remaining watercourses; not crossed and/or no impacts</td>
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<tr>
<td>Groundwater Impacts</td>
<td>Net decrease in ground water quality and/or quantity</td>
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<td>No change in ground water quality or quantity</td>
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<td>Net increase in ground water quality or quantity</td>
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<td></td>
<td>Net increase in ground water quality and quantity</td>
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<tr>
<td>Hydraulics &amp; Hydrology</td>
<td>Negatively impacts existing hydraulics / hydrology. Likely to result in increased flood risk</td>
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<tr>
<td></td>
<td>No anticipated change to existing hydraulics or hydrology (no change in flood risk)</td>
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<td></td>
<td>Design will mitigate flood risks associated with significant storm events</td>
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<td></td>
<td>Excellent</td>
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<tr>
<td></td>
<td>Design will result in elimination of flood risks associated with the 100-year storm event</td>
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<tr>
<td>Stormwater Management and LID</td>
<td>Negative impacts to existing stormwater management facilities</td>
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<td></td>
<td>No net change in stormwater quality or quantity</td>
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<tr>
<td></td>
<td>Improved stormwater quality and quantity handling, including implementation of some LID techniques</td>
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<tr>
<td></td>
<td>Excellent</td>
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<tr>
<td></td>
<td>Space, groundwater table and geotechnical conditions allow for implementation of advanced LID techniques</td>
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</tbody>
</table>

Note: The Block 1 area is subject to an approved Secondary Plan where urban development will occur. This development will create secondary impacts related to noise, light, changes to surface water runoff, presence of domestic pets, and introduction of residential, commercial and institutional uses that will dominate activities in the Secondary Plan area outside of the protected NHS.

Neutral:
- Candidate SWH that have a potential to occur in the Study Area include: Bat Maternity Colonies, Migratory Butterfly Stopover Area, Turtle Nesting Areas and Special Concern and Rare Wildlife Species (Monarch and Snapping Turtle).

Neutral:
- The seven road alignment alternatives only cross one watercourse (WC-5.0) in Block 1, and all of them do so at the same location and with the same proposed width of rights-of-way.

Neutral:
- The creation of roads on the property will affect the site water balance by creating impervious surfaces and the magnitude of the effect will be dependent upon the area of the impervious surfaces. This is expected to decrease evapotranspiration, decrease infiltration of precipitation and increase surface runoff, thus resulting in some decrease of recharge to groundwater and potentially a localized lowering of the groundwater table. This can be mitigated to some extent by directing runoff from the impervious areas towards pervious areas. As the alternative proposed road alignments are very similar in extent and location, no significant difference in effects on groundwater between the alternative road locations are expected. Overall, the effect is quite minimal - 1.2 cm of reduced infiltration over the area due to the reduced area available for infiltration as a result of the new road.

Neutral:
- No anticipated change to existing hydraulics or hydrology (no change in flood risk).

Good:
- Improved stormwater quality and quantity handling, including implementation of some LID techniques.
<table>
<thead>
<tr>
<th>Category and Criteria</th>
<th>Indicators</th>
<th>Route 1a</th>
<th>Route 2a</th>
<th>Route 2b</th>
<th>Route 3a</th>
<th>Route 3b</th>
<th>Route 4a</th>
<th>Route 4b</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Residential Impacts</strong></td>
<td>Poor: Residents displaced and/or large area of residential property required</td>
<td>Poor: One residence potentially displaced at the southwest corner.</td>
<td>Poor: One residence potentially displaced at the southwest corner.</td>
<td>Excellent: No residence displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
</tr>
<tr>
<td></td>
<td>Neutral: No residents displaced but large area of residential property required</td>
<td>Poor: One residence potentially displaced at the southwest corner.</td>
<td>Poor: One residence potentially displaced at the southwest corner.</td>
<td>Excellent: No residence displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
</tr>
<tr>
<td></td>
<td>Good: No residents displaced but some area of residential property required</td>
<td>Poor: One residence potentially displaced at the southwest corner.</td>
<td>Poor: One residence potentially displaced at the southwest corner.</td>
<td>Excellent: No residence displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
</tr>
<tr>
<td></td>
<td>Excellent: No residents displaced and no residential property required</td>
<td>Poor: One residence potentially displaced at the southwest corner.</td>
<td>Poor: One residence potentially displaced at the southwest corner.</td>
<td>Excellent: No residence displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
<td>Poor: Two residences will be displaced.</td>
</tr>
<tr>
<td><strong>Business Impacts</strong></td>
<td>Poor: Businesses displaced and/or large area of commercial property required</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
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<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
</tr>
<tr>
<td></td>
<td>Neutral: No businesses displaced but large area of commercial property required</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
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<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
</tr>
<tr>
<td></td>
<td>Good: No businesses displaced but small area of commercial property required</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
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<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
</tr>
<tr>
<td></td>
<td>Excellent: No businesses displaced, and no commercial property required</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
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<td>Poor: No business displacement but western edge of former Alectra lands may be required.</td>
</tr>
<tr>
<td><strong>Noise Level Impacts</strong></td>
<td>Poor: Increased noise level impact to several residents/businesses</td>
<td>Neutral: Higher noise levels will result from future traffic operations and construction; to be mitigated by noise walls or other measures.</td>
<td>Neutral: Higher noise levels will result from future traffic operations and construction; to be mitigated by noise walls or other measures.</td>
<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
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<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
</tr>
<tr>
<td></td>
<td>Neutral: Modest increase in noise levels to be mitigated.</td>
<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
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</tr>
<tr>
<td></td>
<td>Good: Noise level impact reduced</td>
<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
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<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
</tr>
<tr>
<td></td>
<td>Excellent: Noise level impact significantly reduced</td>
<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
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<td>Good: Anticipated noise level impact to planned residential development is reduced relative to other options.</td>
</tr>
<tr>
<td><strong>Access to Community Services</strong></td>
<td>Poor: Potential impact to access community services</td>
<td>Excellent: Direct access to potential community features located on former Alectra lands.</td>
<td>Excellent: Direct access to potential community features located on former Alectra lands.</td>
<td>Poor: Potential impact to access community services</td>
<td>Excellent: Direct access to potential community features located on former Alectra lands.</td>
<td>Excellent: Direct access to potential community features located on former Alectra lands.</td>
<td>Excellent: Direct access to potential community features located on former Alectra lands.</td>
<td>Excellent: Direct access to potential community features located on former Alectra lands.</td>
</tr>
<tr>
<td></td>
<td>Excellent: Would provide access to future community services</td>
<td>Excellent: Direct access to potential community features located on former Alectra lands.</td>
<td>Excellent: Direct access to potential community features located on former Alectra lands.</td>
<td>Poor: Potential impact to access community services</td>
<td>Excellent: Direct access to potential community features located on former Alectra lands.</td>
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<td>Excellent: Direct access to potential community features located on former Alectra lands.</td>
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<tr>
<td><strong>Recreational Features Impacts</strong></td>
<td>Poor: Required removal of recreational feature(s)</td>
<td>Good: Improved access to existing recreational feature(s)</td>
<td>Good: Improved access to existing recreational feature(s)</td>
<td>Poor: Required removal of recreational feature(s)</td>
<td>Good: Improved access to existing recreational feature(s)</td>
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</tr>
<tr>
<td></td>
<td>Neutral: No removal but reduced access to existing recreational feature(s)</td>
<td>Good: Improved access to existing recreational feature(s)</td>
<td>Good: Improved access to existing recreational feature(s)</td>
<td>Poor: Required removal of recreational feature(s)</td>
<td>Good: Improved access to existing recreational feature(s)</td>
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<td>Good: Improved access to existing recreational feature(s)</td>
<td>Poor: Required removal of recreational feature(s)</td>
<td>Good: Improved access to existing recreational feature(s)</td>
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<td>Good: Improved access to existing recreational feature(s)</td>
<td>Good: Improved access to existing recreational feature(s)</td>
</tr>
<tr>
<td></td>
<td>Excellent: Creation of features and improved access to existing recreational feature(s)</td>
<td>Good: Improved access to the future community centre and recreational facility, identified in the Block 1 Plan.</td>
<td>Good: Improved access to the future community centre and recreational facility, identified in the Block 1 Plan.</td>
<td>Poor: Required removal of recreational feature(s)</td>
<td>Good: Improved access to the future community centre and recreational facility, identified in the Block 1 Plan.</td>
<td>Good: Improved access to the future community centre and recreational facility, identified in the Block 1 Plan.</td>
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<th>Route 4b</th>
</tr>
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<tbody>
<tr>
<td><strong>Archaeological / Built Heritage Impacts</strong></td>
<td>Poor: Significant impacts to cultural or landscape features</td>
<td>Good:</td>
<td>No impacts to built heritage features.</td>
<td>Neutral:</td>
<td>Alignment immediately abutting Mountview cemetery.</td>
<td>Excellent:</td>
<td>Infrastructure provides additional space for, or highlights, cultural features or landscapes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neutral: Minor impacts to cultural or landscape features</td>
<td>Neutral:</td>
<td>Disturbance to land deemed to have some archaeological potential</td>
<td>Good: No disturbance to archaeological sites or land with archaeological potential</td>
<td>Excellent:</td>
<td>Mitigation practices put in place to protect archaeological resource / avoid ground disturbance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good: No impact to cultural or landscape features</td>
<td>Good:</td>
<td>One 1.26 hectares impacted (2 parcels).</td>
<td>Poor: Potential acquisition of one residential property west of former Alectra lands.</td>
<td>Excellent:</td>
<td>Mitigation practices put in place to protect archaeological resource / avoid ground disturbance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excellent: Infrastructure provides additional space for, or highlights, cultural features or landscapes.</td>
<td>Excellent:</td>
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<td>Poor: Potential acquisition of one residential property west of former Alectra lands.</td>
<td>Excellent:</td>
<td>Mitigation practices put in place to protect archaeological resource / avoid ground disturbance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impacts to Non-Participating Lands</strong></td>
<td>Poor: Significant impacts; acquisitions required</td>
<td>Poor:</td>
<td>One 1.26 hectares impacted (2 parcels).</td>
<td>Poor: One 1.26 hectares impacted (1 parcel).</td>
<td>Poor: One 1.26 hectares impacted (1 parcel).</td>
<td>Poor:</td>
<td>As a result of the City of Hamilton’s recent purchase of the former Alectra lands for civic purposes and in recognition of its intent to maintain the land for those uses, the ability to construct this alternative is unlikely.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium: Modest impacts; acquisitions required</td>
<td>Medium:</td>
<td>One 1.26 hectares impacted (2 parcels).</td>
<td>Poor: One 1.26 hectares impacted (1 parcel).</td>
<td>Poor: One 1.26 hectares impacted (1 parcel).</td>
<td>Poor:</td>
<td>As a result of the City of Hamilton’s recent purchase of the former Alectra lands for civic purposes and in recognition of its intent to maintain the land for those uses, the ability to construct this alternative is unlikely.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excellent: No impacts; no acquisition required</td>
<td>Excellent:</td>
<td>One 1.26 hectares impacted (1 parcel).</td>
<td>Poor: Requires acquisition of former Alectra lands, which was recently purchased by the City of Hamilton for specific civic use purposes.</td>
<td>Excellent:</td>
<td>Mitigation practices put in place to protect archaeological resource / avoid ground disturbance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Governance</strong></td>
<td>Poor: Does not conform to Secondary Plan</td>
<td>Good:</td>
<td>Conforms to Secondary Plan for north-south alignment only</td>
<td>Poor: Does not conform to Secondary Plan.</td>
<td>Excellent:</td>
<td>Conforms to Secondary Plan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ease of Implementation</strong></td>
<td>Poor: Significant challenges, which cannot be mitigated</td>
<td>Medium:</td>
<td>One residential property required, which may result in land acquisition.</td>
<td>Poor: As a result of the City of Hamilton’s recent purchase of the former Alectra lands for civic purposes and in recognition of its intent to maintain the land for those uses, the ability to construct this alternative is unlikely.</td>
<td>Medium:</td>
<td>A minimum of two residential properties required, which may result in land acquisition.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium: Significant challenges, but can be mitigated</td>
<td>Medium:</td>
<td>One residential property required, which may result in land acquisition.</td>
<td>Poor: As a result of the City of Hamilton’s recent purchase of the former Alectra lands for civic purposes and in recognition of its intent to maintain the land for those uses, the ability to construct this alternative is unlikely.</td>
<td>Medium:</td>
<td>A minimum of two residential properties required, which may result in land acquisition.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good: Poses few challenges to implementation, but can be mitigated</td>
<td>Good:</td>
<td>One residential property required, which may result in land acquisition.</td>
<td>Poor: As a result of the City of Hamilton’s recent purchase of the former Alectra lands for civic purposes and in recognition of its intent to maintain the land for those uses, the ability to construct this alternative is unlikely.</td>
<td>Medium:</td>
<td>A minimum of two residential properties required, which may result in land acquisition.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Excellent: Poses no challenges to implementation</td>
<td>Excellent:</td>
<td>One residential property required, which may result in land acquisition.</td>
<td>Poor: As a result of the City of Hamilton’s recent purchase of the former Alectra lands for civic purposes and in recognition of its intent to maintain the land for those uses, the ability to construct this alternative is unlikely.</td>
<td>Medium:</td>
<td>A minimum of two residential properties required, which may result in land acquisition.</td>
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</thead>
<tbody>
<tr>
<td>Governance (cont'd)</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated Capital Costs</td>
<td>Poor</td>
<td>High Cost</td>
<td>Medium:</td>
<td>Infrastructure costs: $4.6 - $5.0 million; plus, the potential cost associated with acquiring one residential property.</td>
<td>Medium:</td>
<td>Infrastructure costs: $4.5 - $4.9 million; plus, the potential cost associated with acquiring one residential property and partial acquisition of the former Alectra lands.</td>
<td>Poor:</td>
<td>Infrastructure costs: $5.3 - $5.7 million; plus, the potential cost associated with acquiring two residential property and acquisition of a sliver of former Alectra lands.</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>Medium Cost</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Good</td>
<td>Low Cost</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Pedestrians-Safety, walking environment, encourages walking</td>
<td>Poor</td>
<td>No pedestrian facilities provided</td>
<td>Good:</td>
<td>Will comprise a multi-use path on the east side and a wide sidewalk located on the west side.</td>
<td>Good:</td>
<td>Will comprise a multi-use path on the east side and a wide sidewalk located on the west side.</td>
<td>Good:</td>
<td>Will comprise a multi-use path on the east side and a wide sidewalk located on the west side.</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>Sufficient sidewalk widths with adequate distance between roadway and sidewalk</td>
<td>Good:</td>
<td>The average pedestrian crossing distance is 24.5 m.</td>
<td>Good:</td>
<td>The average pedestrian crossing distance is 22.9 m.</td>
<td>Good:</td>
<td>The average pedestrian crossing distance is 23 m.</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>Sufficient sidewalk widths with large distance between roadway and sidewalk</td>
<td>Good:</td>
<td>The average pedestrian crossing distance is 24.5 m.</td>
<td>Good:</td>
<td>The average pedestrian crossing distance is 22.9 m.</td>
<td>Good:</td>
<td>The average pedestrian crossing distance is 23 m.</td>
</tr>
<tr>
<td></td>
<td>Excellent</td>
<td>Wide sidewalk widths with large distance between roadway and sidewalk</td>
<td>Good:</td>
<td>The average pedestrian crossing distance is 24.5 m.</td>
<td>Good:</td>
<td>The average pedestrian crossing distance is 22.9 m.</td>
<td>Good:</td>
<td>The average pedestrian crossing distance is 23 m.</td>
</tr>
<tr>
<td>Cycling Infrastructure</td>
<td>Poor</td>
<td>No cycling facilities</td>
<td>Good:</td>
<td>New road may consist of a proposed on-street cycle lanes with a buffer in the interim.</td>
<td>Good:</td>
<td>New road may consist of a proposed on-street cycle lanes with a buffer in the interim.</td>
<td>Good:</td>
<td>New road may consist of a proposed on-street cycle lanes with a buffer in the interim.</td>
</tr>
<tr>
<td>Transit Supportive Development</td>
<td>Poor</td>
<td>Decrease in ridership potential</td>
<td>Good:</td>
<td>Gordon Dean will accommodate HSR service for local residents and community facilities.</td>
<td>Good:</td>
<td>Gordon Dean will accommodate HSR service for local residents and community facilities.</td>
<td>Good:</td>
<td>Gordon Dean will accommodate HSR service for local residents and community facilities.</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>No anticipated change in ridership potential</td>
<td>Good:</td>
<td>Provides for improved transit services</td>
<td>Good:</td>
<td>Provides for improved transit services</td>
<td>Good:</td>
<td>Provides for improved transit services</td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>Transit only lanes, significant increase in ridership potential</td>
<td>Good:</td>
<td>Gordon Dean will accommodate HSR service for local residents and community facilities.</td>
<td>Good:</td>
<td>Gordon Dean will accommodate HSR service for local residents and community facilities.</td>
<td>Good:</td>
<td>Gordon Dean will accommodate HSR service for local residents and community facilities.</td>
</tr>
<tr>
<td>Sustainability</td>
<td>Poor</td>
<td>Uses out of date products / practices</td>
<td>Good:</td>
<td>In light of the City of Hamilton Council’s declaration of Climate Change Emergency, the use of LED streetlights and innovative active transportation facility materials (i.e. permeable pavements) would be considered for all alignment alternatives. Exact practices / products to be determined during detailed design. No difference between alternatives.</td>
<td>Good:</td>
<td>In light of the City of Hamilton Council’s declaration of Climate Change Emergency, the use of LED streetlights and innovative active transportation facility materials (i.e. permeable pavements) would be considered for all alignment alternatives. Exact practices / products to be determined during detailed design. No difference between alternatives.</td>
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</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>Uses standard products / practices</td>
<td>Good:</td>
<td>In light of the City of Hamilton Council’s declaration of Climate Change Emergency, the use of LED streetlights and innovative active transportation facility materials (i.e. permeable pavements) would be considered for all alignment alternatives. Exact practices / products to be determined during detailed design. No difference between alternatives.</td>
<td>Good:</td>
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</tr>
<tr>
<td></td>
<td>Good</td>
<td>Incorporates one innovative product or practice</td>
<td>Good:</td>
<td>In light of the City of Hamilton Council’s declaration of Climate Change Emergency, the use of LED streetlights and innovative active transportation facility materials (i.e. permeable pavements) would be considered for all alignment alternatives. Exact practices / products to be determined during detailed design. No difference between alternatives.</td>
<td>Good:</td>
<td>In light of the City of Hamilton Council’s declaration of Climate Change Emergency, the use of LED streetlights and innovative active transportation facility materials (i.e. permeable pavements) would be considered for all alignment alternatives. Exact practices / products to be determined during detailed design. No difference between alternatives.</td>
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</tr>
<tr>
<td></td>
<td>Excellent</td>
<td>Incorporates two or more innovative products or practices</td>
<td>Good:</td>
<td>In light of the City of Hamilton Council’s declaration of Climate Change Emergency, the use of LED streetlights and innovative active transportation facility materials (i.e. permeable pavements) would be considered for all alignment alternatives. Exact practices / products to be determined during detailed design. No difference between alternatives.</td>
<td>Good:</td>
<td>In light of the City of Hamilton Council’s declaration of Climate Change Emergency, the use of LED streetlights and innovative active transportation facility materials (i.e. permeable pavements) would be considered for all alignment alternatives. Exact practices / products to be determined during detailed design. No difference between alternatives.</td>
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<tr>
<td><strong>Truck Operations (2 lanes)</strong></td>
<td>Poor: No curb</td>
<td>Neutral: Curb radii 10+ m larger than standard</td>
<td>Neutral: Curb radii 5-10 m larger than standard</td>
<td>Excellent: Standard curb radii</td>
<td>Neutral: The largest curb radius needed to accommodate truck traffic is 30 m at the northwest quadrant of the Gordon Dean and Hwy 8 intersection.</td>
<td>Neutral: The largest curb radius needed to accommodate truck traffic is 30 m at the northeast quadrant of the Gordon Dean and Barton intersection.</td>
<td>Neutral: The largest curb radius needed to accommodate truck traffic is 30 m at the northeast quadrant of the Gordon Dean and Barton intersection.</td>
<td></td>
</tr>
<tr>
<td><strong>Truck Operations (4 lanes)</strong></td>
<td>Poor: No curb</td>
<td>Neutral: Curb radii larger than standard</td>
<td>Good: Standard curb radii, trucks take two lanes to turn</td>
<td>Excellent: Standard curb radii, truck turns into designated lane</td>
<td>Good: The curb radius follows the City of Hamilton standards, but LCVs turn into the second lane.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drivers - Capacity, speed, intersection operations</strong></td>
<td>Poor: Significant delay</td>
<td>Neutral: Some delay</td>
<td>Good: Acceptable delay, sufficient capacity</td>
<td>Excellent: Significant reduction in congestion</td>
<td>Good: The traffic analysis was conducted for the 2021 future total conditions with all Study Area intersections being unsignalized. Additional analysis was carried out assuming all three future intersections are signalized to provide controlled crossing for pedestrians along Gordon Dean Avenue. It is important to note that the intersection operations analysis for all proposed alternatives will be the same as Synchro software analyzes traffic operations generally based on lane configurations as opposed lane alignments. The analysis results for unsignalized intersections conditions indicate that all movements are expected to operate with residual capacity and acceptable LOS 'D' or better except for the following movements: o Northbound left movement at the intersection of Barton Street and Sunnyhurst Avenue (LOS F); and o Southbound left movement at the intersection of Gordon Dean Avenue and Highway 8 (LOS F). The analysis results for signalized intersections, however, indicate that all movements are expected to operate with residual capacity and acceptable LOS 'D' or better during both AM and PM peak hours.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sight Distance Checks</strong></td>
<td>Poor: Major obstruction</td>
<td>Neutral: Minor obstruction that cannot be easily removed</td>
<td>Good: Minor obstruction that can be easily removed</td>
<td>Excellent: No obstruction</td>
<td>Good: Some trees obstructing the right turn view on Barton St.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Overall Safety</strong></td>
<td>Poor: Severe residual safety risks</td>
<td>Neutral: Meets minimum requirements with some residual risk</td>
<td>Good: Low risk</td>
<td>Excellent: No risk</td>
<td>Good: Safety for the provided options has been assessed by considering the geometric constraints, road function and traffic arrangement of each option. The options share the same general arrangement consistent with recommendations from traffic analysis. All geometric elements of the alignment have been provided to exceed the City of Hamilton and TAC design guidelines minimum standards for the relevant road class and design speed outlined in the design criteria. Combining the geometric and operational considerations a number of checks including sight distance and turn path templates where undertaken and found that no option provided displays any inherent safety issue that can be identified at this stage of design. With these considerations it is expected that all options will operate in an acceptable and safe manner relative to guidelines and road user expectations.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.0 Description of Preferred Design

6.1 Major Features of the Recommended Plan

The proposed improvement includes provision of two new roadways located centrally within the Study Area in north-south and east-west direction. The north-south arterial is Gordon Dean Avenue, and the east-west road from proposed Gordon Dean Avenue to Fruitland Road in alignment with Sherwood Park Road is Collector ‘B’. The preferred alignments of Gordon Dean Avenue and Collector Road ‘B’ are shown in Figure 4.10. Preliminary design plans of the preferred option are provided in Appendix H. Characteristics of each roadway are as follows:

**Gordon Dean Avenue in the interim condition**: is designed as an urbanized undivided arterial road running in a north-south direction within the proposed 36.6 m Right-of-Way. A three-lane cross-section: one northbound, one southbound lane, and a center two-way left turn (TWLT) lane is provided with either on-road Cycle Lanes or a parking lane on both east and west sides of the roadway separated by a buffer from travel lanes. Additionally, a multi-use path on both sides of the corridor is planned, separated by the concrete curb and gutter and boulevard.

**Gordon Dean Avenue in the ultimate condition**: will be designed also as an urbanized undivided arterial road running in a north-south direction within the proposed 36.6 m Right-of-Way. A five-lane cross-section: two northbound, two southbound lanes, and a TWLT at the intersections will be provided. Additionally, a multi-use path on both sides of the corridor is planned, separated by the concrete curb and gutter and boulevard.

**Collector Road ‘B’**: is designed as an urbanized undivided collector road running in an east-west direction within a proposed 26 m road allowance. A basic two-lane cross-section: one eastbound and one westbound lane is provided. Sidewalks on both north and south sides of the roadway are also part of the corridor separated by the boulevard from back of concrete curb and gutter.

6.1.1 Design Criteria

The proposed design criteria applied for Gordon Dean Avenue and Collector Road ‘B’ is provided in Table 6.1 and Table 6.2, respectively.
<table>
<thead>
<tr>
<th>Classification</th>
<th>Design Standards(^1)</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road Classification</td>
<td>UAU 60 (Minor Arterial)</td>
<td>UAU 60 (Minor Arterial)</td>
</tr>
<tr>
<td>Posted Speed (km/h)</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Design Speed (km/h)</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Usage</td>
<td>Truck Route</td>
<td>Truck Route</td>
</tr>
<tr>
<td>Design Vehicle</td>
<td>WB20.5</td>
<td>WB20.5</td>
</tr>
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<td><strong>Horizontal Alignment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>1290 m</td>
<td>5000 m</td>
</tr>
<tr>
<td>Reverse Crown (+0.02 m/m) R(_{\text{min}}) (m)</td>
<td>160 m</td>
<td>5000 m</td>
</tr>
<tr>
<td><strong>Cross Section Elements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lane Widths (m)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Through Lane Width</td>
<td>3.5 - 3.75</td>
<td>3.5</td>
</tr>
<tr>
<td>Left Turn Lane Width</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Right Turn Lane Width</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Curb Lane Width</td>
<td>3.5 - 3.75</td>
<td>3.5</td>
</tr>
<tr>
<td>Cycling Lane Width (interim)</td>
<td>1.5-1.8</td>
<td>2.5</td>
</tr>
<tr>
<td>Bus Bay Width</td>
<td>-</td>
<td>3.75</td>
</tr>
<tr>
<td>Multi-Use Pathway Width (m)</td>
<td>3.0 (min)</td>
<td>3.0</td>
</tr>
<tr>
<td>Tangent Section Cross Fall (%)</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Multi-Use Path Cross Fall (%)</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Vertical Alignment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Grade</td>
<td>6%</td>
<td>2.01%</td>
</tr>
<tr>
<td>Minimum Grade</td>
<td>0.75%</td>
<td>0.75%</td>
</tr>
<tr>
<td>Sag Vertical Curve K(_{\text{min}}) - (Comfort Control)</td>
<td>8-9</td>
<td>-</td>
</tr>
<tr>
<td>Crest Vertical Curve K(_{\text{min}})</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td><strong>Layout</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radius of Curbs at Intersections</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Right-of-Way (ROW) Width (m)</td>
<td>-</td>
<td>36.0</td>
</tr>
</tbody>
</table>

\(^1\) Geometric Design Guide for Canadian Road – 2017 (Transportation Association of Canada)
<table>
<thead>
<tr>
<th>Classification</th>
<th>Design Standards²</th>
<th>Proposed</th>
</tr>
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<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
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</tr>
<tr>
<td>Road Classification</td>
<td>UCU 60 (Minor Collector)</td>
<td>UCU 60 (Minor Arterial)</td>
</tr>
<tr>
<td>Posted Speed (km/h)</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Design Speed (km/h)</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Usage</td>
<td>Passenger</td>
<td>Passenger</td>
</tr>
<tr>
<td>Design Vehicle</td>
<td>Light Truck</td>
<td>Light Truck</td>
</tr>
<tr>
<td><strong>Horizontal Alignment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal Crown (-0.02 m/m) R&lt;sub&gt;min&lt;/sub&gt; (m)</td>
<td>1290 m</td>
<td>400 m</td>
</tr>
<tr>
<td>Reverse Crown (+0.02 m/m) R&lt;sub&gt;min&lt;/sub&gt; (m)</td>
<td>185 m</td>
<td>400 m</td>
</tr>
<tr>
<td><strong>Cross Section Elements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Through Lane Width</td>
<td>3.5 - 3.75</td>
<td>4.0</td>
</tr>
<tr>
<td>Left Turn Lane Width</td>
<td>3.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Right Turn Lane Width</td>
<td>3.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Curb Lane Width</td>
<td>3.5 - 3.75</td>
<td>4.0</td>
</tr>
<tr>
<td>Flush Median Width (m)</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Sidewalk Width (m)</td>
<td>2.0-3.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Tangent Section Cross Fall (%)</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Sidewalk Cross Fall (%)</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Vertical Alignment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Grade</td>
<td>6%</td>
<td>2.35%</td>
</tr>
<tr>
<td>Minimum Grade</td>
<td>0.75%</td>
<td>0.75%</td>
</tr>
<tr>
<td>Sag Vertical Curve K&lt;sub&gt;min&lt;/sub&gt; - (Comfort Control)</td>
<td>8-9</td>
<td>12</td>
</tr>
<tr>
<td>Crest Vertical Curve K&lt;sub&gt;min&lt;/sub&gt;</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td><strong>Layout</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radius of Curbs at Intersections</td>
<td>8.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Right-of-Way (ROW) Width (m)</td>
<td>-</td>
<td>26.0</td>
</tr>
</tbody>
</table>

² Geometric Design Guide for Canadian Road – 2017 (Transportation Association of Canada)
6.1.2 Profile and Alignment

Gordon Dean Avenue:

The proposed horizontal alignment for Gordon Dean Avenue begins with station 0+000 at the future intersection of Highway 8 and ends with station 1+050 at the future intersection of Barton Street. The horizontal alignment is majorly provided as a tangent. A high-radius curve of 5000 m is provided at the vicinity of proposed Gordon Dean Avenue/Collector Road ‘B’ intersection.

The vertical profile is set with a minimum grade of 0.5% along the corridor. Grades are adjusted accordingly to accommodate culvert crossings and to match exiting grades for connection at Highway 8 and Barton Street.

Collector Road ‘B’:

The proposed horizontal alignment for Collector Road ‘B’ begins with station 0+000 at the proposed intersection of Fruitland Road on the west and terminates at Gordon Dean Avenue. The horizontal alignment is majorly provided as a tangent, however a minor shift to the north is provided by a combination of two radii curves of 400 m and 5000 m are provided, separated by 53 m tangent in between immediately east of proposed culvert crossing at WC -5.0.

Similar to Gordon Dean Avenue, the proposed vertical profile of Collector Road ‘B’ is set with a minimum grade of 0.75% along the corridor. Grades are adjusted accordingly to accommodate culvert crossing and to match exiting grades at Fruitland Road and proposed Gordon Dean Avenue.

6.1.3 Typical Cross Section

The typical cross section for both Gordon Dean Avenue and Collector Road ‘B’ illustrating mid-block crossing of the corridors are summarized in Table 6.3 and shown on Figures 6.5, 6.5. and 6.7.

Table 6.3. Typical Cross Section for Gordon Dean Avenue and Collector Road ‘B’

<table>
<thead>
<tr>
<th>Corridor / Features</th>
<th>Gordon Dean Ave. (Interim)</th>
<th>Gordon Dean Ave. (Ultimate)</th>
<th>Collector Road ‘B’</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROW</td>
<td>36 m</td>
<td>36 m</td>
<td>26 m</td>
</tr>
<tr>
<td>Travel Lanes</td>
<td>4.0 m (2)</td>
<td>3.5 m (4)</td>
<td>4.0 m (2)</td>
</tr>
<tr>
<td>Two Way Left Turn Lane</td>
<td>4.5 m (1)</td>
<td>3.5 m (1)</td>
<td>-</td>
</tr>
<tr>
<td>Cycle lane or Parking</td>
<td>2.5 m (2)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Curb and Gutter</td>
<td>0.5 m (2)</td>
<td>0.5 m (2)</td>
<td>0.5 m (2)</td>
</tr>
<tr>
<td>Boulevard</td>
<td>2.0 m (2)</td>
<td>2.0 m (2)</td>
<td>3.0 m (2)</td>
</tr>
<tr>
<td>Multi-Use Path</td>
<td>3.0 m (2)</td>
<td>3.0 m (2)</td>
<td>-</td>
</tr>
<tr>
<td>Sidewalk</td>
<td>-</td>
<td>-</td>
<td>2.0 m (2)</td>
</tr>
</tbody>
</table>
Table 6.3. Typical Cross Section for Gordon Dean Avenue and Collector Road ‘B’

<table>
<thead>
<tr>
<th>Corridor / Features</th>
<th>Gordon Dean Ave. (Interim)</th>
<th>Gordon Dean Ave. (Ultimate)</th>
<th>Collector Road ‘B’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset</td>
<td>4.0 m (2)</td>
<td>4.0 m (2)</td>
<td>3.5 m (2)</td>
</tr>
</tbody>
</table>
Figure 6.9. Cross Section for Gordon Dean Avenue (Interim)
Recommended Ultimate Cross-Section (36.576 m ROW)

Figure 6.10. Cross Section for Gordon Dean Avenue (Ultimate)
Recommended Cross-Section - Collector 'B' (26 m ROW)

Figure 6.11. Cross Section for Collector Road ‘B’
6.1.4 Intersections

A total of four new intersections are proposed for this Project, three of them along Gordon Dean Avenue at the terminal end points and at Collector ‘B’ all of which will be provided with traffic lights and operate as a signalized intersection. The intersection of Collector Road ‘B’ at Fruitland Road is aligned with Sherwood Park Road on the west. Turning lanes will be incorporated at all intersections.

The ultimate configuration sheets are provided in Appendix H.

The configurations of future intersections are summarized in Table 6.4 below:

<table>
<thead>
<tr>
<th>Proposed Intersection</th>
<th>North Approach</th>
<th>South Approach</th>
<th>East Approach</th>
<th>West Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gordon Dean Avenue at Highway 8 (3-legged, Signalized)</td>
<td>1-South Bound Right 1-South Bound Left</td>
<td>- 1-West Bound Through Right 1-West Bound Through</td>
<td>1-East Bound Left 2-East Bound Through</td>
<td></td>
</tr>
<tr>
<td>Gordon Dean Avenue at Collector Road ‘B’ (4-legged, Signalized)</td>
<td>1-South Bound Through Right 1-South Bound Through 1-South Bound Left</td>
<td>1-North Bound Through Right 1-North Bound Through 1-North Bound Left</td>
<td>1-West Bound Through Right 1-West Bound Through</td>
<td>1-East Bound Through Right 1-East Bound Left</td>
</tr>
<tr>
<td>Gordon Dean Avenue at Barton Street (4-legged, Signalized)</td>
<td>1-South Bound Through Right 1-South Bound Left</td>
<td>1-North Bound Through Right 1-North Bound Through 1-North Bound Left</td>
<td>1-West Bound Through Right 1-West Bound Through 1-West Bound Left</td>
<td>1-East Bound Through Right 1-East Bound Through 1-East Bound Left</td>
</tr>
<tr>
<td>Collector Road ‘B’ at Fruitland Road (4-legged, Stop Control)</td>
<td>1-South Bound Through Right 1-South Bound Left</td>
<td>1-North Bound Through Right 1-North Bound Left</td>
<td>1-West Bound Left Through Right</td>
<td>1-East Bound Left Through Right</td>
</tr>
</tbody>
</table>

6.1.5 Structure

Full realignment of WC-5.0 is being proposed as part of the ongoing Block 1 BSS. To accommodate the crossing of WC-05 by Collector Road ‘B’, an open footed span culvert is proposed to be installed immediately to the west of the existing channel. A small section of WC-5.0 at the road crossing is proposed to be realigned to accommodate the new culvert location which also facilitates the majority of construction to occur in isolation of the existing watercourse. In order to complete the channel connection to the existing channel, a new inlet and outlet channel will be constructed. These will consider fluvial geomorphological principles to provide smooth hydraulic transitions between the...
constructed and existing channel as well as aquatic habitat features consistent with the reach. A channel through the open footed bottom of the structure will also be based on fluvial and habitat design considerations. The opening of the structure will provide channel continuity with a floodplain and maintain wildlife corridor functions along the watercourse valley system. The new channel section will be designed as part of the detailed design phase, in connection with a geomorphologist and ecologist input, as required.

To minimize impacts, it is proposed that flow shall be maintained through the existing channel while the span culvert and new channel connections are constructed in the dry, with embankments at the upstream and downstream ends maintained as plugs to isolate the constructed realignment from the existing active channel. Once the new channel is stabilized with vegetation or other erosion control measures to be determined during detailed design, the plugs can be removed, and flow permanently directed to the new channel.

Upon completion of the Block 1 BSS is complete, in addition to future development plans as part of the Secondary Plan, a permanent realignment channel for WC-5.0 upstream and downstream of the crossing will be designed. This channel realignment will fully take into consideration the new crossing structure and associated channels to provide an effective and functional connection into the proposed culvert.

A preliminary cross section of the proposed span culvert is shown in Figure 6.8, and the proposed location of the culvert is identified on the preliminary conceptual design plans in Appendix H. The ultimate dimensions and location of span culvert along with the channel realignment will be determined at the detailed design phase. The ultimate length of the channel realignment will also be determined during the detailed design stage of the Project. However, under preliminary configuration, approximately 90 m of the existing channel of WC-5.0 will be realigned, with a new approximately 92 m long channel.

Commissioning of the new channel will be done during the appropriate phase of construction following best management practices to mitigate the likelihood of downstream impacts (e.g., sediment releases) or harm to fish.
Figure 6.12. Preliminary Cross Section of the Proposed Span Culvert at WC 5.0
6.1.6 Active Transportation
Gordon Dean Avenue will have a multi-use path on both sides of the road in both the interim and ultimate. The average pedestrian crossing distance will be 22.9 m. Collector Road ‘B’ is identified to have a sidewalk.

An option for either bike lanes with a buffer or on-street parking is recommended in the interim, however this will be determined in accordance with the City of Hamilton direction during detailed design.

6.1.7 Accessibility for Ontarians with Disabilities Act Measures
The Accessibility for Ontarians with Disabilities Act requires that all barriers in the built environment (public spaces and buildings) be removed. The Integrated Accessibility Standards Regulation identifies the specific requirements that must be implemented for public spaces and the associated timelines. During the detailed design phase, the designers will need to confirm that the design for the proposed Gordon Dean Avenue and Collector Road ‘B’ meets the minimum requirements as defined by the Accessibility for Ontarians with Disabilities Act.

6.1.8 Property Requirements
Gordon Dean Avenue

Two residential properties and a portion of the former Alectra lands (now owned by City of Hamilton) will be required to allow construction of the southern section of the Gordon Dean Avenue. In addition, potential minor property impacts are anticipated on a residential property along Highway 8. Property acquisition as well as minor property impacts shall be addressed by the proponent responsible for the construction of the southern section of Gordon Dean Avenue from Collector Road ‘B’ intersection to Highway 8.

Collector Road ‘B’

Potential minor impacts are anticipated on two properties along Fruitland Road. These impacts shall be addressed by the Fruitland – Winona Development Group either via design refinements and/or in consultation with property owners to discuss and negotiate compensation for property impacts.

6.1.9 Utilities
Accurate determination of the location and need for relocation of underground utilities shall be determined during detailed design. Any collateral impacts to adjacent property and natural features due to relocation will be determined at that time.

6.1.10 Illumination
Illumination work along Gordon Dean Avenue and Collector Road ‘B’ will be carried in detailed design and cost saving and environmentally sustainable measures, such as installation of LED lights will be determined in detailed design. The detailed design team shall notify the appropriate system operators before making changes to the existing lighting system.
6.1.11 Construction Implementation

The responsibility for the design and construction of Gordon Dean Avenue from Barton Street, south to the northern limit of #703 Highway 8 (former Alectra lands) will be that of the Fruitland – Winona Development Group. The remaining section of Gordon Dean Avenue, from the northern limit of #703 Highway 8 (former Alectra lands) to Highway 8 will be the responsibility of the proponent developing those lands. Similarly, Collector Road ‘B’ from Fruitland Road to and including the intersection of Gordon Dean Avenue will be designed and constructed by the Proponent of this Study.

6.1.12 Construction Staging

Both the Gordon Dean Avenue and Collector Road ‘B’ will be constructed to their ultimate configuration with pavement, curbs, streetlight, and utilities provided at their ultimate locations. However, Gordon Dean Avenue is planned in two stages, namely ‘Interim’ and ‘Ultimate’. These stages differ only with respect to number and width of travel lanes. Shifting from interim to ultimate will be done by obliterating pavement markings provided during the interim stage and providing delineation with new markings under the ultimate scenario. No other construction activity is expected for this shift.

6.1.13 Preliminary Cost Estimate

The preliminary cost estimate for Gordon Dean Avenue and Collector Road ‘B’ is provided in Table 6.5 and Table 6.6. The cost estimate for the construction of Gordon Dean Avenue, is $3,440,924.00, whereas cost estimate for the construction of Collector Road ‘B’ is $2,454,308.00. This estimate is exclusive of property costs.
### Table 6.5. Preliminary Cost Estimate for Gordon Dean Avenue

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Unit Cost</th>
<th>Quantity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Removal</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Clearing</td>
<td>Lump Sum</td>
<td>$20,000</td>
<td>1</td>
<td>$20,000</td>
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<tr>
<td><strong>New Road Construction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top Asphalt (Superpave 9.5)</td>
<td>Tonne</td>
<td>$130</td>
<td>1996</td>
<td>$259,480</td>
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<tr>
<td>Base Asphalt (Superpave 19.0)</td>
<td>Tonne</td>
<td>$120</td>
<td>5201</td>
<td>$624,120</td>
</tr>
<tr>
<td>Granular A (150mm)</td>
<td>Tonne</td>
<td>$25</td>
<td>7802</td>
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</tr>
<tr>
<td>Granular B (300mm)</td>
<td>Tonne</td>
<td>$30</td>
<td>15604</td>
<td>$468,120</td>
</tr>
<tr>
<td>Concrete Curb</td>
<td>Metre</td>
<td>$70</td>
<td>2200</td>
<td>$154,000</td>
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<tr>
<td>Catchbasin</td>
<td>Each</td>
<td>$3,000</td>
<td>24</td>
<td>$72,000</td>
</tr>
<tr>
<td>Double Catchbasin</td>
<td>Each</td>
<td>$4,000</td>
<td>4</td>
<td>$16,000</td>
</tr>
<tr>
<td>Storm Manhole</td>
<td>Each</td>
<td>$8,000</td>
<td>8</td>
<td>$64,000</td>
</tr>
<tr>
<td>Storm Sewer</td>
<td>Metre</td>
<td>$400</td>
<td>800</td>
<td>$320,000</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pavement Marking</td>
<td>Linear Metre</td>
<td>$5</td>
<td>4400</td>
<td>$22,000</td>
</tr>
<tr>
<td>Streetlight</td>
<td>Each</td>
<td>$1,500</td>
<td>24</td>
<td>$36,000</td>
</tr>
<tr>
<td>Traffic Signs</td>
<td>Lump Sum</td>
<td>$50,000</td>
<td>1</td>
<td>$50,000</td>
</tr>
<tr>
<td>Traffic Signal (3-Legged)</td>
<td>Each</td>
<td>$150,000</td>
<td>1</td>
<td>$150,000</td>
</tr>
<tr>
<td>Traffic Signal (4-Legged)</td>
<td>Each</td>
<td>$200,000</td>
<td>2</td>
<td>$400,000</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>$2,850,770</td>
</tr>
<tr>
<td>Contingency / Minor items</td>
<td>Lump Sum</td>
<td>20%</td>
<td>1</td>
<td>$570,154</td>
</tr>
<tr>
<td>Utility Relocation</td>
<td>Lump Sum</td>
<td>$20,000</td>
<td>100%</td>
<td>$20,000</td>
</tr>
<tr>
<td><strong>Total (Excluding HST)</strong></td>
<td></td>
<td></td>
<td></td>
<td>$3,440,924</td>
</tr>
</tbody>
</table>

3 The cost estimate is exclusive of property costs.
## Table 6.6. Preliminary Cost Estimate for Collector Road ‘B’

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Unit Cost</th>
<th>Quantity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Removal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clearing</td>
<td>Lump Sum</td>
<td>$20,000</td>
<td>1</td>
<td>$20,000</td>
</tr>
<tr>
<td><strong>New Road Construction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top Asphalt (Superpave 9.5)</td>
<td>Tonne</td>
<td>$130</td>
<td>434</td>
<td>$56,420</td>
</tr>
<tr>
<td>Base Asphalt (Superpave 19.0)</td>
<td>Tonne</td>
<td>$120</td>
<td>1132</td>
<td>$135,840</td>
</tr>
<tr>
<td>Granular A (150 mm)</td>
<td>Tonne</td>
<td>$25</td>
<td>1698</td>
<td>$42,450</td>
</tr>
<tr>
<td>Granular B (300 mm)</td>
<td>Tonne</td>
<td>$30</td>
<td>3396</td>
<td>$101,880</td>
</tr>
<tr>
<td>Concrete Curb</td>
<td>Metre</td>
<td>$70</td>
<td>1200</td>
<td>$84,000</td>
</tr>
<tr>
<td>Catchbasin</td>
<td>Each</td>
<td>$3,000</td>
<td>6</td>
<td>$18,000</td>
</tr>
<tr>
<td>Double Catchbasin</td>
<td>Each</td>
<td>$4,000</td>
<td>6</td>
<td>$24,000</td>
</tr>
<tr>
<td>Storm Manhole</td>
<td>Each</td>
<td>$8,000</td>
<td>5</td>
<td>$40,000</td>
</tr>
<tr>
<td>Storm Sewer</td>
<td>Metre</td>
<td>$300</td>
<td>400</td>
<td>$120,000</td>
</tr>
<tr>
<td>Span Culvert</td>
<td>Each</td>
<td>$1,350,000</td>
<td>1</td>
<td>$1,350,000</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pavement Marking</td>
<td>Linear Metre</td>
<td>$5</td>
<td>600</td>
<td>$3,000</td>
</tr>
<tr>
<td>Streetlight</td>
<td>Each</td>
<td>$1,500</td>
<td>12</td>
<td>$18,000</td>
</tr>
<tr>
<td>Traffic Signs</td>
<td>Lump Sum</td>
<td>$50,000</td>
<td>1</td>
<td>$15,000</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>$2,028,590</td>
</tr>
<tr>
<td>Contingency / Minor items</td>
<td>Lump Sum</td>
<td>20%</td>
<td>1</td>
<td>$405,718</td>
</tr>
<tr>
<td>Utility Relocation</td>
<td>Lump Sum</td>
<td>$20,000</td>
<td>100%</td>
<td>$20,000</td>
</tr>
<tr>
<td><strong>Total (Excluding HST)</strong></td>
<td></td>
<td></td>
<td></td>
<td>$2,454,308</td>
</tr>
</tbody>
</table>

---

4 The cost estimate is exclusive of property costs.
7.0 Potential Impacts, and Mitigation Measures

This section outlines the potential environmental impacts and proposed mitigation measures associated with the Project, including:

- Construction and operation of Gordon Dean Avenue from Barton Street to Highway 8;
- Construction and operation of Collector Road ‘B’ from Gordon Dean Avenue to Fruitland Road; and,
- Realignment of a small section of WC-5.0 (~ 90 m) to the west of the existing channel and installation of a new open footed span culvert. The ultimate dimensions and location of the span culvert along with the inlet and outlet channel realignment elements will be determined at the detailed design phase, based on the additional recommendations of the ongoing BSS for the Block 1 Area.

It is recommended that the impacts and mitigation measures as outlined in this section shall be fully reviewed during the detailed design phase of the Project and refined, as necessary, as the design details develop and in consideration of the relevant recommendations of the ongoing BSS for Block 1 Area. The design development shall also be undertaken in consultation with appropriate agencies (i.e., HCA, DFO, etc.) as necessary, and stakeholders such as the City of Hamilton. Once finalized, the permanent mitigation measures shall be incorporated into the designs and specifications and temporary measures and obligations are assembled in the construction contract packages so that contractors are aware of these requirements when preparing their tender submission, and ultimately can implement compliantly during the execution phase.

Future commitments including the monitoring of construction activities are intended to confirm that relevant environmental standards and commitments for construction are met and that EA commitment compliance is achieved. An important aspect of the future commitments is that all required permits, approvals, authorizations and licenses as required to execute the works are obtained and appropriate consultation will occur with the authorities having jurisdiction through the permit/approval application process.

Potential impacts and proposed mitigation measures are discussed below, and additional details are provided in Table 7.3. Future commitments and permitting considerations are outlined in section 8.0.

7.1 Socio-Economic Environment

7.1.1 Property Requirements

As noted in Section 6.1.8, property acquisition will be required, and minor property impacts will need to be addressed to allow construction of Gordon Dean Avenue and Collector Road ‘B’. Two residential properties and a portion of the former Alectra lands (now owned by City of Hamilton) will be required to implement the Project. Purchases will be required for Municipal addresses #703, 715 and 717 Highway 8 to allow construction of the southern section of the Gordon Dean Avenue. In addition, potential minor property impacts are anticipated on a residential property along Highway 8.
Property acquisition as well as minor property impacts for the southern section of Gordon Dean Avenue from Collector Road ‘B’ intersection to Highway 8 will need to be addressed by the proponent responsible for the construction of that section. Minor property impacts associated with the construction of Collector Road ‘B’ shall be addressed by the Fruitland – Winona Development Group.

Given the greenfield nature of this road design, there will be no impacts on local traffic during construction. Intersection development at both Highway 8 and Barton Street, and any associated impacts and mitigation obligations in relation to the transportation environment will be addressed by the associated EAs and detailed design for improvements to those two roadways.

Ultimately, the combined development of Gordon Dean Avenue and Collector Road ‘B’ will fulfill the objectives of the Phase 1 and 2 studies to remove truck traffic related impacts on Fruitland Road. Additional benefits will be derived from the promotion of active transportation along the Gordon Dean Avenue with development of the multi-use path.

### 7.2 Natural Environment

#### 7.2.1 Terrestrial Resources

Approximately 5 ha of the vegetation communities and approximately 2.25 ha of open country habitat (meadow and marsh) will be impacted due to road construction. The open country habitat has recently supported breeding avian SAR (Bobolink and Eastern Meadowlark) and other species. The impacted area of these communities is provided in Table 7.1.

<table>
<thead>
<tr>
<th>ELC Code</th>
<th>Description</th>
<th>Total Area (ha)</th>
<th>Impact Area (ha)</th>
<th>Percent Impacted (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVR_3</td>
<td>Single Family Residential</td>
<td>10.19</td>
<td>0.63</td>
<td>6.18</td>
</tr>
<tr>
<td>CVR_4</td>
<td>Rural Property</td>
<td>6.36</td>
<td>1.19</td>
<td>18.71</td>
</tr>
<tr>
<td>FODM9-6</td>
<td>Fresh Moist Oak-Hardwood Deciduous Forest</td>
<td>0.67</td>
<td>0.11</td>
<td>16.42</td>
</tr>
<tr>
<td>H</td>
<td>Hedgerow</td>
<td>2.02</td>
<td>0.66</td>
<td>32.67</td>
</tr>
<tr>
<td>MAM2-2</td>
<td>Reed-canary Grass Mineral Meadow Marsh</td>
<td>0.16</td>
<td>0.05</td>
<td>31.25</td>
</tr>
<tr>
<td>MAS2-1</td>
<td>Cattail Mineral Shallow Marsh</td>
<td>0.02</td>
<td>0.02</td>
<td>100</td>
</tr>
<tr>
<td>MASM1-1</td>
<td>Cattail Mineral Shallow Marsh</td>
<td>0.01</td>
<td>0.01</td>
<td>100</td>
</tr>
<tr>
<td>MEMM4</td>
<td>Fresh - Moist Mixed Meadow Ecosite</td>
<td>15.96</td>
<td>2.3</td>
<td>14.41</td>
</tr>
<tr>
<td>OAGM1</td>
<td>Annual Row Crops</td>
<td>2.05</td>
<td>0.08</td>
<td>3.9</td>
</tr>
</tbody>
</table>
### Table 7.1. Impacted Area of Vegetation Communities and Open Country Habitat

<table>
<thead>
<tr>
<th>OAO</th>
<th>Open Aquatic</th>
<th>0.01</th>
<th>0.01</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>37.45 ha</td>
<td>5.06 ha</td>
<td>13.51%</td>
</tr>
</tbody>
</table>

In addition, Barn Swallows, Bobolink and Eastern Meadowlark were seen within the Study Area. It appears that the presence of these species may vary from year to year, so it is recommended that MECP be consulted to confirm next steps for any ESA compliance considerations and if any compensation requirements will be required. With Study details further advanced during detailed design; this consultation is to be undertaken.

Tree and vegetation clearing and grubbing operations (including meadow areas) shall be planned to avoid seasonal timing constraint windows for wildlife (e.g. migratory bird nest protection period: restrict clearing activities to between Sept 1 and March 31 to avoid conflict with Migratory Birds Convention Act). Monitoring shall be conducted to ensure that nests are not present if construction activities require clearing during the nesting period. Such clearing during the constraint period shall be limited to simple habitat only, consistent with due diligence guidelines as provided by Environment and Climate Change Canada: [https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html](https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html).

Although the WC-0.5 watercourse and associated valley is very fragmented by urban development along its course, detailed design of the Collector Road ‘B’ crossing will consider the accommodation of maintenance of wildlife and terrestrial corridor functions at least within the area between Highway 8 and Barton Street. The structure has been selected as a span culvert allowing for floodplain benches of up to 50% of the structure opening width supporting any wildlife corridor passage function that presently exists or may develop in the future through this valley reach. The opening of the structure will be designed to accommodate small to medium sized urban wildlife with a soffit height on the order of 1.5 m above the floodplain benches. The benches will be designed such that substrate materials will not inhibit wildlife passage.

It is recommended that an Environmental Management Plan be prepared prior to construction to summarize protective measures and actions during construction, and guidelines for incidents and emergencies related to natural environment, including spills release, wildlife protection, wildlife encounter procedures and wildlife rescue protocols.

During the detailed design phase, a tree inventory shall be completed, and a Tree Protection Plan shall be prepared and implemented in accordance with City of Hamilton guidelines for tree protection and trees proposed for removal.

#### 7.2.2 Aquatic Resources

As noted in Section 4.3.2, WC-5.0 is a small watercourse, characteristically exhibiting very little flow during dry periods. Accordingly, no fish have been observed or collected during fish community surveys, suggesting WC-5.0 provides indirect fish habitat. Potential fish barriers (at least in effect for part of the year) were observed downstream...
of the Study Area, and would likely be impassable due to low water level/flow, steep gradient differences in water level elevation, wide and shallow sediment bar zones and large woody debris clogging the channel. The system is also further fragmented downstream between the Study site and Lake Ontario by major culverts.

The design for the Collector Road ‘B’ crossing of WC-0.5 is a span culvert structure with an open footing. The wide span of approximately 11 m will accommodate hydrologic and geomorphological functional processes, supporting an active channel with linkage to a floodplain area.

To maintain the channel and floodplain linkage upstream, through and downstream of the structure, inlet and outlet channels will be required. The new realigned channels will be connected to the existing channel to establish a smooth hydraulic transition. The ultimate length of the channel realignment associated with the structure inlet and outlet will also be determined during the detailed design stage of the Project. As per the preliminary configuration developed for the purpose of this study, approximately 90 m of the existing channel of WC-5.0 will be realigned, with a new approximately 92 m long channel, including approximately 24 m segment that flows through the structure. Accordingly, there will be essentially no net loss of functional habitat over the long term. In order to maintain aquatic habitat function, natural channel design principles will be applied such that stream morphology and instream habitat is recreated and/or enhanced where the opportunity is feasible. Such habitat restoration will maintain the aquatic ecosystem functional attributes consistent with indirect fish habitat as described for the existing watercourse.

Given that Trees and shrubs were present along the banks through the crossing area, providing partial or almost complete shade cover, for the majority of the subject watercourse reach, a vegetation restoration plan will be prepared during detailed design that applies native woody and groundcover species consistent with the local geographic region. The restoration will be applied to establish a sound riparian and overbank vegetation community within the disturbed area of the valley.

With respect to minimizing construction impacts of the structure and associated channel realignment, it is proposed that flow shall be largely maintained through the existing channel while the span culvert and new channel connections are constructed in the dry, with embankments at the upstream and downstream ends maintained as plugs to isolate the constructed realignment from the existing active channel. Once the new channel is stabilized with vegetation or other erosion control measures to be determined during detailed design, the plugs can be removed, and flow permanently directed to the new channel.

The details associated with the channel habitat and floodplain restoration zone will be developed through consultation with the City of Hamilton, HCA and DFO as may be required.

7.3 Cultural Environment

7.3.1 Archaeological Resources

As noted in Section 4.5.1, there is moderate potential for the discovery of archaeological resources in the undisturbed portions of any fields which are currently used for
agricultural purposes. A Stage 2 Archaeological Assessment shall be undertaken during detailed design to confirm if any site-specific mitigation actions may be required prior to construction. The Stage 2 Archaeological Assessment shall be conducted in accordance with the Standards and Guidelines for Consultant Archaeologists set out by the MHSTCI (2011) pursuant to the Ontario Heritage Act, R.S.O. 1990, c. 0.18. Prior to conducting Stage 2 field testing, and following the guidance provided in the draft MTCS bulletin, Engaging Aboriginal Communities in Archaeology (2011) and the Standards and Guidelines for Consultant Archaeologists (2011), it is considered best practice for the proponent to issue information sharing letters to appropriate Indigenous communities. The information sharing letters shall briefly outline the overall Study objectives, the scope of work for the Stage 2 field assessment and an invitation to have field liaisons present during Stage 2 investigation.

The Stage 2 Archaeological Assessment Report for the southern portion of Gordon Dean Avenue, from Collector Road ‘B’ intersection to Highway 8 shall be completed by the proponent responsible for the construction of that section of the road. The Stage 2 Archaeological Assessment for this section of the road shall address any requirements and measures that may be required to facilitate construction of the southern portion of Gordon Dean Avenue along Mountview Gardens Cemetery. Due to the close proximity of the proposed Gordon Dean Avenue to Mountview Gardens Cemetery, it is anticipated that a Cemetery Investigation may be required. The need for a Cemetery Investigation shall be confirmed with MHSTCI and/or the Bereavement Authority of Ontario, as appropriate. If required, the Cemetery Investigation shall be conducted in accordance with the MHSTCI’s Standards and Guidelines for Consultant Archaeologists (2011) and in consultation with the Deputy Registrar of Cemeteries at the Bereavement Authority of Ontario. MHSTCI’s approval of the Stage 2 Archaeological Assessment Report shall be obtained prior to conducting the Cemetery Investigation.

7.3.2 Built Heritage Resources and Cultural Heritage Landscapes
As noted in Section 0, no significant built heritage features or cultural heritage landscapes will be displaced or disrupted as a result of this Project. Therefore, no further cultural and built heritage assessments or protection/mitigation are required.

7.4 Drainage
As noted in Section 4.5, the ongoing BSS for Block 1 Area will propose stormwater management facilities for the future development within Block 1 area, which will provide improved stormwater quality and quantity handling, including implementation of some LID techniques. Stormwater management recommendations from the Block 1 BSS shall be incorporated in the detailed design phase of this Project in relation to the development of Gordon Dean Avenue and Collector Road ‘B’ to confirm that long term stormwater management and associated surface water protection requirements account for road runoff.
7.5 Groundwater and Source Water Protection

7.5.1 Groundwater
This Project is not anticipated to have a major impact on the groundwater given the shallow nature of the excavation works and the minimal spatial conversion of the roads to impervious surfaces relative to the overall landscape area.

As noted in Section 4.5, a hydrogeological assessment was initiated as part of the ongoing BSS for the Block 1 Area, however, it was not yet finalized at the time of preparation of this ESR. Relevant mitigation measures identified in the hydrogeological assessment report shall be incorporated into the detailed design phase of this Project. In addition, a private well survey should be completed within 500 m of the Study Area as a preconstruction activity to establish the presence of any active wells that are present nearby, to confirm the quality and quantity of the water produced by these wells, and undertake an assessment of the conditions of these wells.

7.5.2 Source Water Protection

7.5.2.1 Highly Vulnerable Aquifers
As noted in Section 4.6.2, the Study Area is located within an area of Highly Vulnerable Aquifers. The runoff from the proposed roads is not anticipated to permeate to the aquifer as runoff will be conveyed to an appropriate outlet via the storm sewer system. Additionally, best management practices shall be implemented during construction to prevent any fuel lubricants and fluid spills resulting from construction activities and manage any unanticipated occurrences that could result in impacts to groundwater. All spills that could potentially cause damage to the environment will be reported to the Spills Action Centre of the Ministry of the Environment, Conservation, and Parks.

7.6 Air Quality
Implementation of the Block 1 BSS and adjacent planned development will result in air quality impacts that are recognized to represent a component of the land development process. Typical of the development process, the major roads including Gordon Dean Avenue and Collector Road 'B', will be the first elements to be developed and may result in localized air quality changes. These roads are necessary to support the land use components of advancing the Secondary Plan. The current and future impacts to air quality were always anticipated to occur by permitting development in an area that is currently largely fallow agricultural land.

While air quality impacts will occur in the Secondary Plan area from the municipal roads and planned development, additional air quality studies will be undertaken during detailed design to ascertain the potential impact on any sensitive receptors proposed in the planning area. Potential air quality impacts to present and future sensitive receptors will be minimized as much as possible through the design for traffic efficiency in the operation of the roadways.

Construction related air emissions can be expected, including dust from various material handling operations and combustion emissions from construction equipment, which is typically powered by diesel engines. Such emissions will be of a temporary nature and
the impact is not predicted to move far from the immediate vicinity of the construction activities along the major roads. Best management practices shall be utilized during construction to mitigate any air quality impacts caused by construction dust (i.e., use of non-chloride dust suppressants).

Typical mitigation measures include the control of air quality impacts from dust releases around the construction sites and construction equipment and are summarized in Table 7.3.

7.7 Noise
Higher noise levels are anticipated to result from future traffic operations and construction. The operational noise impact will be addressed by a noise study to be completed during detailed design and in consideration of the development planning with consideration for any impact mitigation measure requirement which could include sound walls, sound berms and future development layout design where dwellings would include road lay-bys running parallel to Gordon Dean Avenue thus allowing fronts of dwellings to face the roadway such that dwellings act as sound buffers to rear yard amenity areas. Such a layout will be a component of the associated development planning process.

Construction noise impacts are temporary and largely unavoidable. The contractor shall ensure that construction equipment is maintained in good operating condition to prevent unnecessary noise. The contractor shall also restrict construction activities to hours prescribed by City of Hamilton Noise Control By-Law (By-Law No. 11-285) (City of Hamilton, 2011).

7.8 Climate Change Considerations
Climate change influences on Ontario’s rainfall patterns are expected to increase the future risk of flooding. As well, more precipitation is projected in the winter, though this could vary greatly by region. More importantly for stormwater management considerations, much of this precipitation will be rain, not snow. Summer precipitation is projected to be, on average, unchanged, although localized increases and decreases changes are expected (Environmental Commissioner of Ontario, 2018; Metzger, 2017).

Current and future rainfall scenarios available to inform design are available from various sources, namely:

- City of Hamilton;
- Environment and Climate Change Canada;
- University of Western Ontario Intensity-Duration-Frequency (IDF) CC Tool;
- Ontario Climate Change Data Portal; and
- Ministry of Transportation Ontario Trending Tool.

A review of these sources suggest the potential for climate change to influence design rainfall that may be relevant to the design of aspects of the Project. Consideration shall be given to climate change influenced rainfall in the design of drainage and stormwater management features.
7.8.1 Other Climate Change Impacts Considerations

Additional climate change considerations with regard to roadway design and construction are outlined in Table 7.2.

Table 7.2. Climate Change and Potential Transportation Infrastructure Impacts

<table>
<thead>
<tr>
<th>Climate Hazard and/or Weathering Process Likely Affected by a Changing Climate</th>
<th>Potential Infrastructure Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater frequency of freeze-thaw cycles in winter months</td>
<td>• Soil instability, ground movement and slope instability</td>
</tr>
<tr>
<td></td>
<td>• Triggered instability of embankments and pavement structures (ditches, culverts, drains, street hardware, bridges, tunnels)</td>
</tr>
<tr>
<td></td>
<td>• Increased frequency, duration and severity of: thermal cracking, rutting, frost heave and thaw weakening</td>
</tr>
<tr>
<td>Hotter, drier summers</td>
<td>• Pavement softening</td>
</tr>
<tr>
<td></td>
<td>• Reduction in the maximum loads that can be safely transported</td>
</tr>
<tr>
<td></td>
<td>• Asphalt-covered surfaces are more susceptible to damage during heat waves</td>
</tr>
<tr>
<td></td>
<td>• Increased challenges in pavement construction process</td>
</tr>
<tr>
<td></td>
<td>• Shortened life expectancy</td>
</tr>
<tr>
<td></td>
<td>• Drier conditions affecting the life cycle of bridges and culverts</td>
</tr>
<tr>
<td></td>
<td>• Augmentation of Urban Heat Island Effect</td>
</tr>
<tr>
<td>Milder winters</td>
<td>• Longer construction season, fewer pothole repairs</td>
</tr>
<tr>
<td></td>
<td>• Less frost damage for southern roads</td>
</tr>
<tr>
<td></td>
<td>• Decreased damage from fewer freeze-thaw cycles</td>
</tr>
<tr>
<td></td>
<td>• Changes to maintenance schedules</td>
</tr>
</tbody>
</table>

Source: (International Institute for Sustainable Development, 2013)

The design of the roadways shall give consideration to the issues noted in the above table.

7.8.2 Greenhouse Gas Emissions (GHG) Considerations

GHG emissions as a direct result of the Project development will arise from the construction and maintenance phases of the Project. Construction emissions would be expected to be of limited duration and would represent a small temporary increase. It is recommended that a GHG emissions assessment be completed early in the detailed design phase in order to quantify the GHG emissions generated by various roadway treatments and construction alternatives. The outcomes of this assessment will assist decision makers to confirm any treatments to implement.
Sustainability is about a reconciling between environmental, social and economic demands to ensure that our society has the economic prosperity and stability to enable us to maintain or improve quality of life, protect the environment and promote a prosperous and competitive economy. Considering construction sustainability in planning the Project should reflect on the approach to the development and implementation of sustainable practices and approaches during the detailed design and construction phases of the Project and can be directly linked to the objectives of the City of Hamilton’s Community Climate Change Action Plan. Further details on climate change considerations is presented in Appendix I.

### 7.8.3 Summary of Environmental Impacts and Mitigation

The environmental impacts that are likely to occur during construction of the Project, and associated mitigation measures and best management practices to be applied are summarized in Table 7.3.
<table>
<thead>
<tr>
<th>Category</th>
<th>Potential Impacts</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Requirements</td>
<td>• Property acquisition and additional minor property impacts to allow construction of the southern section of the Gordon Dean Avenue.</td>
<td>• Property acquisition as well as minor property impacts shall be defined during detailed design and then addressed by the proponent responsible for the construction of the southern section of Gordon Dean Avenue from Collector Road ‘B’ intersection to Highway 8.</td>
</tr>
<tr>
<td></td>
<td>• Minor property impacts along Fruitland Road to allow construction of Collector Road ‘B’.</td>
<td>• Minor property impacts along Fruitland Road to allow construction of Fruitland Road shall be addressed by the Fruitland – Winona Development Group either via design refinements and/or in consultation with property owners to discuss and negotiate compensation for property impacts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terrestrial Resources</td>
<td>• Removal of vegetation and existing disturbed riparian cover at the WC-5.0.</td>
<td>• Contact MECP via Information Gathering Form (IGF) for direction on removal of SAR open country bird habitat (Bobolink and Eastern Meadowlark) and Endangered bat habitat assessments to address any wooded features (e.g. hedgerows and woodlot fragments) to be impacted.</td>
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<td>• Removal of specific wildlife habitats (i.e. seasonal foraging, nesting and migratory habitat).</td>
<td>• It is recommended that an Environmental Management Plan be prepared to summarize protective measures and actions during construction, and guidelines for incidents and emergencies related to natural environment, including spills release, wildlife protection, wildlife encounter procedures and wildlife rescue protocols.</td>
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<td>• Permanent loss of some types of habitat (e.g. open country bird habitat) which cannot be replicated within future NHS.</td>
<td>• Plan tree and vegetation clearing and grubbing operations (including meadow areas) to avoid seasonal timing constraint windows for wildlife (e.g. migratory bird nesting protection period: restrict clearing activities to between Sept 1 and March 31 to avoid conflict with Migratory Birds Convention Act). Plan monitoring to ensure that nests are not present if construction activities require clearing during nesting period. Such clearing during the constraint period shall be limited to simple habitat only, consistent with due diligence guidelines as provided by Environment and Climate Change Canada: <a href="https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html">https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html</a>.</td>
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<td>• Reduction in local native species abundance and diversity, including locally rare and potentially uncommon Hawthorn (<em>Crataegus pruniosa</em>).</td>
<td>• Conduct tree inventory and prepare and implement Tree Protection Plan in accordance with City of Hamilton guidelines for tree protection and trees proposed for removal. Install streetscape tree plantings in accordance with City of Hamilton standards.</td>
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<td>• Local micro-climate alteration.</td>
<td>• Identify native plant materials to be potentially salvaged for use in habitat enhancement works, or to be transplanted, including locally significant species (e.g. <em>Crataegus pruniosa</em>, <em>Cornus</em> spp, <em>Salix</em> spp, <em>Rosa carolina</em>) and quality groundcovers such as <em>Comandra umbellata</em>, <em>Potentilla simplex</em> and other quality species. Identify areas for storage or ‘healing-in’.</td>
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<td>• Soil erosion resulting in potential for siltation to WC-5.0.</td>
<td>• Prepare and implement an Erosion and Sediment Control Plan in accordance with the Erosion and Sediment Control Guidelines for Urban Construction (TRCA 2019), which will also include silt fencing that can strategically be applied to serve as wildlife exclusion fence for small wildlife.</td>
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<td>• Alteration of local hydrologic functioning.</td>
<td>• Plan storage and disposal of construction waste and debris. Prepare and implement Landscape Plan for watercourse crossing. Native species that are representative of those found in the Hamilton region should be used. All disturbed areas should be restored to equal or better condition.</td>
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<td>• Reinstate vegetative cover in compliance with HCA and City requirements.</td>
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<tr>
<td>Aquatic Resources</td>
<td>• Introduction of sediments, concrete and other deleterious substances into WC-5.0.</td>
<td>• Study activities shall be scheduled to avoid wet and rainy periods and in-water works shall be conducted during low flow condition.</td>
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<td>• Alteration of flows due to installation of in-water structure</td>
<td>• All dewatering discharge, if required, shall be directed to a filter bag to remove sediments. The filter bag shall be located in an area that is sufficiently vegetated, stable and does not display any evidence of erosion or instability.</td>
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<td>• Disruption of critical fish life stages</td>
<td>• Operate, store, and maintain equipment, vehicles, and associated materials in a manner that prevents the entry of any deleterious substance from entering into the natural environment as indicated in Ontario Provincial Standard Specification (OPSS) 182 (Environmental Protection for Construction in Waterbodies and on Waterbody Banks), OPSS 517 (Construction Specification for Dewatering) and OPSS 805 (Construction Specification for Temporary Erosion and Sediment Control Measures).</td>
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<td>General</td>
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Table 7.3. Potential Impacts and Proposed Mitigation Measures
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<tr>
<th>Category</th>
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| Erosion and sedimentation due to the operation of machinery | • Temporarily store, handle and dispose of all materials used or generated (e.g. organics, soils, construction waste and debris, etc.) during site preparation, construction, and clean-up in a manner that prevents their entry to any watercourse. To the extent possible, restrict the temporary on-site storage of sediment generated as part of the Project works.  
  • Ensure a Spill Management Plan (including spill kit materials, instructions regarding their use, education of staff, and emergency contact numbers) is present on-site at all times for implementation in the event of an accidental spill. All spills are to be reported to the MECP Spills Action Centre at 1-800-268-6060.  
  • Any stockpiled materials shall be properly contained, stored and stabilized away at least 30 m from any watercourse or waterbody.  
  • All construction materials shall be removed from site upon Project completion.  
  • All localized re-grading and creation of the new channel bed and banks that transition to the existing channel and bank should be designed and constructed to be stable and carefully inspected to ensure they transition smoothly with the adjacent channel connections. The transition areas should then be inspected again to ensure they remain stable and smooth, and no erosion points develop.  
  • The existing metal culvert, upstream of the crossing location, may be used during construction to facilitate access across WC-5.0.  
  • Project works shall comply with required permitting and authorizations, based on consultation with HCA, DFO and MNRF.                                                                                       |                                                                                                                                     |
| Loss of vegetative cover within the riparian zone and over the watercourse, therefore potentially impacting existing thermal regime | • If used, any pumps and associated hoses conveying water in WC-5.0 during construction will be appropriately screened to prevent entrainment of fish.  
  • Though no fish were detected during the field investigation, it is recommended that the contractor obtain a Licence to Collect Fish for Scientific Purposes (LCFSP) from the MNRF and a fish rescue and relocation plan be implemented after isolation of the in-water work area (if required).  
  • Design and construct a new realignment of equal or greater area than that of the existing channel, and apply a fish habitat, valley and riparian zone vegetation restoration plan.                                                                 |                                                                                                                                     |
| Fish and Fish Habitat                          | • Based on the absence of fish during the field investigation, it is anticipated the timing window permitting in-water work from July 16 to March 14 of any year will be implemented, however this will be confirmed via consultation with HCA and MNRF.  
  • If used, any pumps and associated hoses conveying water in WC-5.0 during construction will be appropriately screened to prevent entrainment of fish.  
  • Though no fish were detected during the field investigation, it is recommended that the contractor obtain a Licence to Collect Fish for Scientific Purposes (LCFSP) from the MNRF and a fish rescue and relocation plan be implemented after isolation of the in-water work area (if required).  
  • Design and construct a new realignment of equal or greater area than that of the existing channel, and apply a fish habitat, valley and riparian zone vegetation restoration plan.                                                                 |                                                                                                                                     |
| Sediment and Erosion Control Measures          | • Apply a Project Erosion and Sedimentation Control Plan that addresses both general and site-specific erosion protection considerations.  
  • Standard erosion and sediment control (ESC) measures (e.g. silt fence) shall be applied consistent with OPSS to ensure no negative effects to surface waters. The control measures shall be implanted prior to work and be maintained during Project works and until disturbed areas will be reinstated to original or improved condition, upon completion of works.  
  • All ESC measures that are non-biodegradable should be removed from the site when work is complete, and the site is stabilized.  
  • Where on site dewatering is required, discharge to outlet through a filter bag to reduce suspended solids and discharge velocity.  
  • Pump intakes are to be suspended and/or placed in clear stone sump to avoid sediment uptake by the pumps  
  • Discharges placed in stable ditches only and must be lined to form a splashpad (rip rap/geotextile or membrane) to avoid erosion at high velocity outlet.  
  • Stockpiles to be located on level ground, with greatest practicable distance from sewer systems (sanitary and storm), drainage ditches and watercourses (above high-water mark).  
  • Surround stockpiles with appropriate perimeter ESC measures (e.g. silt fence and biologs) or cover with secured geotextiles/membranes.                                                                 |                                                                                                                                     |
Table 7.3. Potential Impacts and Proposed Mitigation Measures

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<tbody>
<tr>
<td>Shoreline / Bank / Vegetation / Stabilization</td>
<td>• Install storm water detention device to intercept storm water, settle suspended solids, and release bylaw compliant storm water at a controlled rate.</td>
<td>• Catch basin inlets with the potential to receive sediment due to construction activity are to be protected on site, and in the immediate vicinity off site based on run-off risk.</td>
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<td>• The disturbance or removal of riparian vegetation should be minimized.</td>
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<td>• Construction access, work areas and associated requirements for removal of riparian vegetation will be minimized to the extent required for the construction activities. All temporarily disturbed areas will be re-stabilized following construction using appropriate means.</td>
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<td>• Banks disturbed by any activity associated with the Project will be stabilized immediately to prevent erosion and/or sedimentation, preferably through re-vegetation with native species suitable for the site and/or other suitable and approved methods.</td>
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<td>• In the event that riverstone erosion protection/arming is required to stabilize eroding or exposed areas, appropriately sized, clean rock will be used. Rock will be installed at a similar slope to maintain a uniform bank and bed, as well as the proposed new channel connections.</td>
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<td>• Substrates selected for the WC-0.5 floodplain benches shall consider the need to maintain passage opportunities for small wildlife and will be designed to not impose an impediment to movement through the structure opening.</td>
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<td>Operation of Machinery</td>
<td>• Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds as indicated in OPSS 182.</td>
<td>• Construction staging shall occur in a manner to prevent spills and/or leaks into the creek.</td>
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<td>• Implement drip pans under equipment (i.e. generators, pumps, etc.) in operation within the work areas.</td>
<td>• Any refueling is to be undertaken at least 30 m from any watercourse or any other surface drainage feature as indicated OPSS 180 (Management of Excess Materials) and OPSS 182.</td>
</tr>
<tr>
<td>Archaeological Resources</td>
<td>• Impacts to potential archaeological resources.</td>
<td>A Stage 2 Archaeological Assessment shall be undertaken during detailed design to confirm if any site-specific mitigation actions may be required prior to construction.</td>
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<td>• The Stage 2 Archaeological Assessment shall be conducted in accordance with the <em>Standards and Guidelines for Consultant Archaeologists</em> set out by the MHSTCI (2011) pursuant to the Ontario Heritage Act, R.S.O. 1990, c. 0.18. Prior to conducting Stage 2 field testing, and following the guidance provided in the draft MTCS bulletin, Engaging Aboriginal Communities in Archaeology (2011) and the Standards and Guidelines for Consultant Archaeologists (2011), it is considered best practice for the proponent to shall information sharing letters to appropriate Indigenous communities. The information sharing letters shall briefly outline the overall Study objectives, the Scope of Work for the Stage 2 field assessment and an invitation to have field liaisons present during Stage 2 testing.</td>
<td>The Stage 2 Archaeological Assessment Report for the southern portion of Gordon Dean Avenue, from Collector Road ’B’ intersection to Highway 8 shall be completed by the proponent responsible for the construction of that section of the road. The Stage 2 Archaeological Assessment shall also address any additional requirements and measures that may be required to facilitate construction of southern portion of Gordon Dean Avenue along Mountview Gardens Cemetery. The Stage 2 Archaeological Assessment for this section of the road shall address any requirements and measures that may be required to facilitate construction of the southern portion of Gordon Dean Avenue along Mountview Gardens Cemetery. Due to the close proximity of the proposed Gordon Dean Avenue to Mountview Gardens Cemetery, it is anticipated that a Cemetery Investigation may be required. If required, the...</td>
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### Table 7.3. Potential Impacts and Proposed Mitigation Measures

| Category                  | Potential Impacts                                      | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
<p>| Drainage                  | Stormwater Management                                  | The ongoing BSS for Block 1 Area will propose stormwater management facilities for the future development within Block 1 area. Stormwater management recommendations from the BSS shall be incorporated in the detailed design phase of this project.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Groundwater               | Impacts to groundwater                                 | Complete a private water well survey within 500 m of Study Area as a preconstruction activity to establish the number of active wells that are present nearby, and the quality and quantity of the water produced by these wells, as well as an assessment of the conditions of these wells. Any well complaints received during the course of the construction should be investigated by a qualified professional and recommendations generated on the potential source of the well complaint and recommendations on how to address the issue (if required).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Source Water Protection   | Impacts to Highly Vulnerable Aquifers due to construction | Best management practices shall be implemented during construction to prevent any fuel lubricants and fluid spills resulting from construction activities and manage any unanticipated occurrences that could result in impacts to groundwater. All spills that could potentially cause damage to the environment shall be reported to the Spills Action Centre of the Ministry of the Environment, Conservation, and Parks (800-268-6060).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Air Quality               | Impacts to Air Quality during construction              | Scheduling of works to consider weather forecast to take advantage of precipitation for natural dust suppression or favourable wind conditions to direct dust away from sensitive receptors. Construction activities are scheduled and planned to limit areas of exposed soil at any given time (e.g. clear vegetation, but strategically grub). Plan site layout to maximize separation from machinery and dust-causing activities and receptors. Ensuring equipment (and adequate water supply, if applicable) required for dust control and trained workers are available at work sites prior to commencing activities with potential for dust generation. Stabilize exposed ground surfaces with non-erodible material as soon as practicably possible after construction in the affected area where soil surfaces will remain exposed for extended periods. Construction vehicles / machinery and equipment shall be in good repair, equipped with emission controls, as applicable, properly maintained and operated within regulatory requirements. A minimal number of machines operating in any one area shall be carefully considered during construction activities. Minimize idling of equipment and trucks located in queuing areas in proximity of residences and other establishments. |
| Noise                     | Short-term noise impacts during construction             | The contractor shall ensure that construction equipment is maintained in good operating condition to prevent unnecessary noise. The contractor shall also restrict construction activities to hours prescribed by City of Hamilton Noise Control By-Law (By-Law No. 11-285) (City of Hamilton, 2011). Identify designated truck routes which avoid proximity to potential receptors and identify appropriately low speed limits via signage. Use industry standard equipment and vehicle idle reduction initiatives, as possible. Provide direction for equipment which must be left running to have the maximum practical separation distance from potential receptors. |</p>
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<th>Mitigation Measures</th>
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<td>Establish communication and requirements for contractor to reduce or eliminate tailgate banging on material delivery.</td>
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</table>
8.0 Future Commitments

8.1 Detailed Design Commitments
Additional detailed design commitments will be required to fulfill the obligations as defined and outlined in this EA. Direct site-specific mitigation measures are summarized in Section 7.0 which can inform the detailed design. To further confirm findings of this EA and refine the design, the following work effort and studies will be required:

- Obtain legal surveys to confirm property requirements and initiate negotiations with property owners as may be required.
- Complete hydrologic and hydraulic assessment of the WC-5.0 crossing to confirm final location of the span culvert and associated channel realignment details and appropriate erosion control measures.
- Undertake a vegetation restoration/landscape plan.
- Undertake geotechnical investigations and analysis.
- Review completed hydrogeological study as part of the Block 1 BSS and incorporate any findings that require accommodation in the road detailed design.
- Incorporate the recommendations of the Fluvial Geomorphological and Meander Belt Width Assessment from the Block 1 BSS.
- Determine and undertake full illumination of Gordon Dean Avenue and Collector Road ‘B’ and notify the appropriate system operators prior to making changes to the existing lighting system.
- Follow the recommendation of the noise study, which will be undertaken during detailed design.
- Review safety requirements of Gordon Dean Avenue and Collector Road ‘B’ in greater detail.
- Confirm the preferred cross-section for the interim to include either a buffered cycle lane or on-street parking.
- Confirm innovative practices / products that can be incorporated, such as LED streetlights and types of active transportation facility material.
- Identify the impact on drainage and stormwater features from climate change influenced rainfall, which will be determined through the Block 1 BSS and during detailed design.
- Complete an air quality assessment to assess the impacts of Gordon Dean Avenue on air quality.
- Confirm that the design for the proposed Gordon Dean Avenue and Collector Road ‘B’ meets the minimum requirements as defined by the Accessibility for Ontarians with Disabilities Act.
- Confirm Project capital costs including property requirements.
• Confirm construction staging and organizational responsibility with the City of Hamilton for the completion of Gordon Dean Avenue.

• Confirm construction staging and traffic management in coordination of commitments in other adjacent EAs and/or design studies for the development of intersections on Fruitland Road, Barton Street, and Highway 8.

• Review and incorporate stormwater management, utilities and other servicing aspects as determined by the Block 1 BSS in relation to the road development.

• Confirm utilities and relocation, as required.

• Complete the construction plan, with consideration given to noise and dust control, protection of natural environment, etc.

• Complete traffic signal design.

• Determine the design of the future transit facility (if required) such as lanes, stops and shelters.

• Complete a GHG emissions assessment early in the detailed design phase in order to quantify the GHG emissions generated by various roadway treatments and construction alternatives.

• Complete Stage 2 Archaeological Assessment during detailed design to confirm if any site-specific mitigation actions may be required prior to construction.

• Confirm and complete relevant permitting and approval and incorporate conditions in design and specifications as may be required.

• Confirm the in-water works timing window of July 16 to March 14 of any year via consultation with HCA and/or MNRF. This is based on the absence of fish during the field investigations.

• Complete a private water well survey within 500 m of Study Area as a preconstruction activity to establish the number of active wells that are present nearby, and the quality and quantity of the water produced by these wells, as well as an assessment of the conditions of these wells.

• Complete a tree inventory and establish a tree preservation plan as may be required to address City of Hamilton guidelines.

8.2 Permits and Approvals

There are a number of permits and approvals that may be required before the construction of the Project begins. These permits and approvals are listed below and shall be reviewed and confirmed during detailed design:

• Complete a Request for Review submission to DFO during detailed design for works in WC-5.0.

• Consult with HCA and MNRF to confirm any permit requirements under applicable legislation, including O. Reg 155/06 (HCA) and the Fish and Wildlife Conservation Act (FWCA) (MNRF).
• Obtain approval/authorization from the Ministry of Heritage, Sport, Tourism and Culture Industries regarding archaeological resources prior to any ground disturbance activities.

• An Environmental Activity and Sector Registry may be required for the following:
  o Surface water takings related to specific road construction purposes
  o Ground water and/or storm water takings of more than 50,000 L/day but less than 400,000 L/day for the purposes of construction site dewatering

• An Environmental Compliance Approval is required for municipal stormwater management works associated with the road development and will be integrated with the Block 1 BSS elements.

• Obtain a License to Collect Fish for Scientific Purposes (LCFSP) from the MNRF. This shall be completed by the contractor during construction.

8.3 Monitoring

A monitoring plan shall be developed during detailed design in consultation with the City of Hamilton and regulatory agencies (i.e., HCA, MNRF, MECP) as may be required to confirm that implementation of the future commitments and mitigation measures stated in this report and the EIA (Appendix E) and conditions as may be applied to permits, approvals and authorizations. The plan shall also include provisions to monitor the effective function of the mitigation measures as intended and any contingency plans. Monitoring considerations will include:

• Apply a regular Environmental Monitoring/Inspection program during the course of the Project construction to confirm environmental protection measures and commitments are being applied.

• Conduct due diligence nesting bird surveys and implement buffers or other avoidance measures if clearing must occur between April 1 and August 31.

• Monitor and maintain erosion control and tree protection fencing; address any failures with maintenance.

• Monitor plantings in WC-5.0 crossing and streetscape; to confirm that revegetated cover complies with HCA and City requirements.

• Ensure that protected trees are not damaged; treat under direction of an arborist or remove if damaged.

• Maintain records of monitoring, maintenance and construction incidents.

• Apply WC-0.5 channel realignment work under the monitoring guidance of a fluvial geomorphologist, fish habitat biologist, and restoration ecologist.

• Any permit, approval or authorization specific monitoring defined as permit conditions will be undertaken by qualified specialist. There requirements will be defined during the detailed design phase.
9.0 References


City of Hamilton. (2010). *City of Hamilton Motion - Amendment to Truck Route – Fruitland Road, from Barton Street East to Highway 8. Council Date: July 8, 2010*. Retrieved from http://www2.hamilton.ca/NR/rdonlyres/AF1A541B-BE71-4006-A0A1-5BD330923F08/0/Jul08EDRMS_n90711_v1_Motion_7_1.pdf


Dillon Consulting Ltd. (2010). Natural Heritage Assessment of Lands Bounded by Fruitland Road, Glover Road, Barton Street and Highway 8.


