Gordon Dean Avenue - 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

11/23/2020

Wood Environment & Infrastructure
Solutions a Division of Wood Canada
Limited
www.woodplc.com

11/23/2020
Jack Restivo
JR Professional Corporation Barrister and Solicitor
Fruitland – Winona Development Group
4 Hughson Street South, Suite 1000
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 (Phases 3 and 4). 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

Prepared by:

Aniqa Shams, B.E.S, MCIP RPP
Environmental Planner
aniqa.shams@woodplc.com

Mir Ahsan Talpur, M.Env.Sc., EP
Environmental Planner
mir.talpur@woodplc.com

Reviewed by:

Andreas Stenzel, M.Sc.
Environmental Lead
andreas.stenzel@woodplc.com

Gordon Dean Avenue - 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

Prepared by:
Wood Environment & Infrastructure Solutions a Division of Wood Canada Limited
3450 Harvester Road, Suite 100
Burlington, ON L7N 3W5
Canada
T: 905-335-2353

11/23/2020

Copyright and non-disclosure notice

The contents and layout of this report are subject to copyright owned by Wood (© Wood Environment & Infrastructure Solutions a Division of Wood Canada Limited). save to the extent that copyright has been legally assigned by us to another party or is used by Wood under license. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Wood. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third Party Disclaimer set out below.

Third-party disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Wood at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Wood excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

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, the City staff have been closely consulted during the study process.

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-planning/master-plans-class-eas/block-servicing-strategies-stoney-creek-and-gordon-dean-class

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:

Consultation Schedule	
Type	**Date**
Study Initiation	August 18, 2015
Notice of Study Commencement and PIC #1, published in newspaper and mailed to Study Mailing List (which included government agencies) and City of Hamilton Councillors	Newspaper Advertisement: March 24 and March 31, 2017 Mail-out to City of Hamilton Councilors: March 10, 2017
PIC #1	April 4, 2017
Notice of PIC #2, published in newspaper and mailed to Study Mailing List	Newspaper Advertisement: March 23 and March 30, 2019 Mail-out: October 9, 2019
Technical Advisory Committee Meeting	October 10, 2019
PIC #2	October 17, 2019

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 85º - 90º 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:

Alignment Alternatives for Gordon Dean Avenue and Collector Road 'B'	
Alignment Alternatives	**General Description**
Option 1a – West of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities)	• North-south road (Gordon Dean Avenue) would run west of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). • East-west road would run east from Fruitland Road with curved sections in the west.
Option 2a – Traverse Western Portions of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). East-West Road runs parallel to Barton Street.	• North-south road (Gordon Dean Avenue) would traverse western and northern sections of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). • East-west road would align with Sherwood Park Road at Fruitland Road.
Option 2b - Traverse Western and northern Portions of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) + Modified East-West Road	• North-south road (Gordon Dean Avenue) would traverse western and northern sections of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). • East-west road would run slightly north of Option 2a from Fruitland Road.
Option 3a - Traverse Central and Eastern Portions of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). East-West Road runs parallel to Barton Street.	• North-south road (Gordon Dean Avenue) would traverse central and eastern sections of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities), including the existing commercial building. • East-west road would align with Sherwood Park Road at Fruitland Road.

Alignment Alternatives for Gordon Dean Avenue and Collector Road 'B'	
Alignment Alternatives	**General Description**
Option 3b - Traverse Central and Eastern Portions of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) + Modified East-West Road	• North-south road (Gordon Dean Avenue) would traverse central and eastern sections of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities), including the existing commercial building. • East-west road would run slightly north of Option 3a from Fruitland Road.
Option 4a – East of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). East-West Road runs parallel to Barton Street.	• North-south road (Gordon Dean Avenue) would run mostly east of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). • East-west road would align with Sherwood Park Road at Fruitland Road.
Option 4b – East of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) + Modified East-West Road	• North-south road (Gordon Dean Avenue) would run mostly east of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). • 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 City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities), 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 90º angle. The preferred road option will operate in an acceptable and safe manner relative to guidelines and road user expectations.

Gordon Dean Avenue and Collector Road 'B' - Preferred Alternative

Description of Preferred Design

Gordon Dean Avenue

Gordon Dean Avenue in the ultimate condition will be designed as an urbanized undivided arterial road running in a north-south direction within the proposed 36.0 m Right-of-Way. A five-lane cross section: two northbound, two southbound lanes, painted median/planter, a left turn at the intersections will be provided. Additionally, a multi-use path is planned on the east side of the corridor with sidewalk on the west side, both separated by the boulevard from the back of the concrete curb and gutter.

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. Provision of a 3.0 m multi-use path along the north side could to be considered during detailed design.

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

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. Placement of lights shall be considered in detailed design as per City of Hamilton's Comprehensive Development Guidelines and Financial Policies Manual (M.18. Appendix R – Sidewalk and Roadway Lighting Guideline). A pdf of these development guidelines can be downloaded from this link: https://www.hamilton.ca/develop-property/policies-guidelines/comprehensive-development-guidelines-and-financial-policies

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, in connection with a geomorphologist and ecologist input, as required.

The culvert structure has been also been proposed at a location and configuration that can accommodate and not compromise the future WC-5.0 realignment planned under future land development. Upon completion of the Block 1 Servicing Strategy, in addition to future development plans as part of the Secondary Plan, the permanent realignment channel for WC-5.0 upstream and downstream of the Collector Road 'B' crossing will be designed. This channel realignment will take into full consideration the new crossing structure and associated inlet and outlet channels to provide an effective and functional conveyance connection into the proposed culvert.

Construction Implementation

The responsibility for this Study is that of Fruitland – Winona Development Group, however, Gordon Dean Avenue and Collector Road 'B' from Fruitland Road to and including the intersection of Gordon Dean Avenue may be designed and constructed by various proponents.

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.

Environmental Issues and Commitments

Socio-Economic Environment - Property Requirements

Property acquisition will be required to allow construction of Gordon Dean Avenue and Collector Road 'B'. Property acquisitions will be required for Municipal addresses #703, 715 and 717 Highway 8. Any land acquisitions required to implement this project will involve consultation with the landowner(s) to determine and negotiate compensation requirements.

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 accommodate 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 5.0 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. The new channel will be a natural channel constructed using natural channel design principals. 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

A Stage 1 Archaeological Assessment Report was completed by Wood in September 2020. The Stage 1 Archaeological Assessment was carried out in accordance with the Ontario Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) Standards and Guidelines for Consultant Archaeologists (2011) pursuant to the Ontario Heritage Act, R.S.O. 1990, c. O.18. It determined that the study area has general

archaeological potential and warrants Stage 2 Archaeological Assessment on those areas.

In addition, based on engagement with Mississaugas of the Credit First Nation, Field Liaison Representatives shall be involved in Stage 2 Archaeological Assessment (and any additional archaeological fieldwork) during detailed design phase of this project.

Cultural Environment - Built Heritage Resources and Cultural Heritage Landscapes

A Cultural Heritage memo was completed by Wood in September 2020. It determined that the work is planned within the southwest corner of BHR 2 (725 Highway No. 8) and in close proximity to a one-storey residence on the property. A Heritage Impact Assessment should be completed at the outset of the detailed design phase of the Project to determine whether this property has CHVI under O. Reg. 9/06 of the Ontario Heritage Act. If the property is found to have CHVI, then an impact assessment should be completed to evaluate the impacts of the proposed work and recommend appropriate mitigation measures.

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.

Table of Contents

1.0 Introduction and Background ... 1
1.1 Introduction ... 1
1.2 Historical Background ... 2
1.3 Environmental Assessment ... 6
1.3.1 Municipal Class Environmental Assessment Process ... 6
1.4 Project Team Organization ... 11
2.0 Overview of Phases 1 and 2 ... 12
2.1 Past and Current Adjacent Studies ... 12
2.2 Phase 1: Problem/Opportunity Statement ... 16
2.3 Phase 2: Alternative Solutions ... 17
3.0 Consultation ... 24
3.1 Study Mailing List ... 24
3.2 Notice of Study Commencement ... 25
3.3 Public and Landowner Consultation ... 25
3.3.1 Public Information Centre #1 ... 25
3.3.2 Public Information Centre #2 ... 27
3.4 Indigenous Engagement ... 31
3.5 Agency Consultation ... 32
3.5.1 Meetings ... 33
3.5.2 Review of the Draft Environmental Study Report ... 39
3.6 Utility Consultation ... 40
4.0 Existing Conditions ... 41
4.1 Study Area ... 41
4.2 Socio-Economic Environment ... 41
4.2.1 Land Use ... 41
4.2.2 Municipal Plans ... 42
4.2.3 Provincial Land Use Planning Initiatives ... 45
4.2.4 Existing Roadway Network ... 48
4.2.5 Existing Traffic Conditions ... 48
4.2.6 Existing Transit and Active Transportation Network ... 49
4.2.7 Future Traffic Conditions ... 50
4.3 Natural Environment ... 51
4.3.1 Terrestrial Resources ... 51
4.3.2 Aquatic Resources ... 63
4.4 Cultural Environment ... 68
4.4.1 Archaeological Resources ... 68
4.4.2 Built Heritage Resources and Cultural Heritage Landscapes ... 68
4.5 Drainage ... 72
4.6 Groundwater and Source Water Protection ... 72
4.6.1 Groundwater ... 72
4.6.2 Source Water Protection ... 74
4.7 Air Quality ... 75
4.8 Noise ... 76
4.9 Fluvial Geomorphology ... 76
5.0 Development and Evaluation of Alternative Design Concepts ... 77

5.1 Preliminary Evaluation of Alternative Design Concepts (2017) 77
5.1 Refined Evaluation of Alternative Design Concepts (2019) 79
5.1.1 Evaluation Criteria 79
5.1.2 Evaluation Methodology 81
5.2 Development of Alternative Design Concepts 82
5.2.1 Alignments 82
5.2.2 Intersections 84
5.3 Evaluation of Alternative Design Concepts 92
5.3.1 Preferred Alignment 92
6.0 Description of Preferred Design 100
6.1 Major Features of the Recommended Plan 100
6.1.1 Design Criteria 100
6.1.2 Profile and Alignment 102
6.1.3 Typical Cross Section 103
6.1.4 Intersections 106
6.1.5 Structure 106
6.1.6 Active Transportation 109
6.1.7 Urban Design 109
6.1.8 Accessibility for Ontarians with Disabilities Act Measures 109
6.1.9 Property Requirements 110
6.1.10 Utilities 110
6.1.11 Illumination 110
6.1.12 Construction Implementation 110
6.1.13 Construction Staging 111
6.1.14 Preliminary Cost Estimate 111
7.0 Potential Impacts, and Mitigation Measures 114
7.1 Socio-Economic Environment 114
7.1.1 Property Requirements 114
7.2 Natural Environment 115
7.2.1 Terrestrial Resources 115
7.2.2 Aquatic Resources 117
7.3 Cultural Environment 118
7.3.1 Archaeological Resources 118
7.3.2 Built Heritage Resources and Cultural Heritage Landscapes 119
7.4 Drainage 120
7.5 Groundwater and Source Water Protection 120
7.5.1 Groundwater 120
7.5.2 Source Water Protection 120
7.6 Air Quality 121
7.7 Noise 121
7.8 Climate Change Considerations 121
7.8.1 Other Climate Change Impacts Considerations 122
7.8.2 Greenhouse Gas Emissions (GHG) Considerations 123
7.9 Summary of Environmental Impacts and Mitigation 123
8.0 Future Commitments 128
8.1 Detailed Design Commitments 128

8.2 Permits and Approvals 132
8.3 Monitoring 132
9.0 References 134

List of Tables

Table 2.1: Identification of Alternative Solutions to the Problem
Table 2.2: Summary of Work that Addressed the Phase 2 EA Requirements
Table 3.1: Consultation Schedule
Table 3.2: PIC #1 - Summary of Comments and Responses
Table 3.3: PIC #2 - Summary of Comments and Responses
Table 3.4: Summary of Meetings with the City of Hamilton
Table 3.5: Summary of Meetings with the Hamilton Conservation Authority
Table 3.6: TAC Meeting Invitation and Attendees
Table 4.1: Level of Service and Description of Operations
Table 4.2: General Channel Characteristics of Watercourse 5.0
Table 5.1: Evaluation Criteria for Alternatives
Table 5.2: Alignment Alternatives for Gordon Dean Avenue and Collector Road 'B'
Table 5.3: Evaluation of Alignment Alternatives
Table 6.1: Design Criteria for Gordon Dean Avenue
Table 6.2: Design Criteria for Collector Road 'B'
Table 6.3: Typical Cross Section for Gordon Dean Avenue and Collector Road 'B'
Table 6.4: Proposed Intersections for Gordon Dean Avenue and Collector Road 'B' – Ultimate Configurations
Table 6.5: Preliminary Cost Estimate for Gordon Dean Avenue
Table 6.6: Preliminary Cost Estimate for Collector Road 'B'
Table 7.1: Impacted Area of Vegetation Communities and Open Country Habitat
Table 7.2: Climate Change and Potential Transportation Infrastructure Impacts
Table 7.3: Potential Impacts and Proposed Mitigation Measures
Table 8.1: Summary of Detailed Design Commitments for Gordon Dean Avenue and West Portion of Collector Road 'B'

List of Figures

Figure 1.1: Study Area
Figure 1.2: Phase 1 and 2 Preferred Planning Solution for Fruitland Road
Figure 1.3: Municipal Class Environmental Assessment Process
Figure 4.1: Vegetation Communities
Figure 4.2: Aquatic Assessment Study Area
Figure 4.3: Aquatic Habitat
Figure 4.4: Areas of Archaeological Potential
Figure 4.5: Built Heritage Resources
Figure 5.1: Alternative Alignment Option 1a
Figure 5.2: Alternative Alignment Option 2a
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
Figure 5.7: Alternative Alignment Option 4b
Figure 6.1: Recommended Cross Section for Gordon Dean Avenue (Ultimate 36.0 m ROW)
Figure 6.2: Recommended Cross Section for Collector Road 'B' (26.0 m ROW)
Figure 6.3: Preliminary Cross Section of the Proposed Span Culvert at WC 5.0

List of Appendices

Appendix A: Public Consultation
Appendix B: Indigenous Consultation
Appendix C: Agency Consultation
Appendix D: Traffic Report
Appendix E: Environmental Impact Assessment
Appendix F: Aquatic Assessment Report
Appendix G: Stage 1 Archaeological Assessment Report
Appendix H: Cultural Heritage Checklist
Appendix I: Evaluation of Alternatives Memo
Appendix J: Preliminary Design Plans for the Preferred Option
Appendix K: Climate Change Considerations Memo

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.

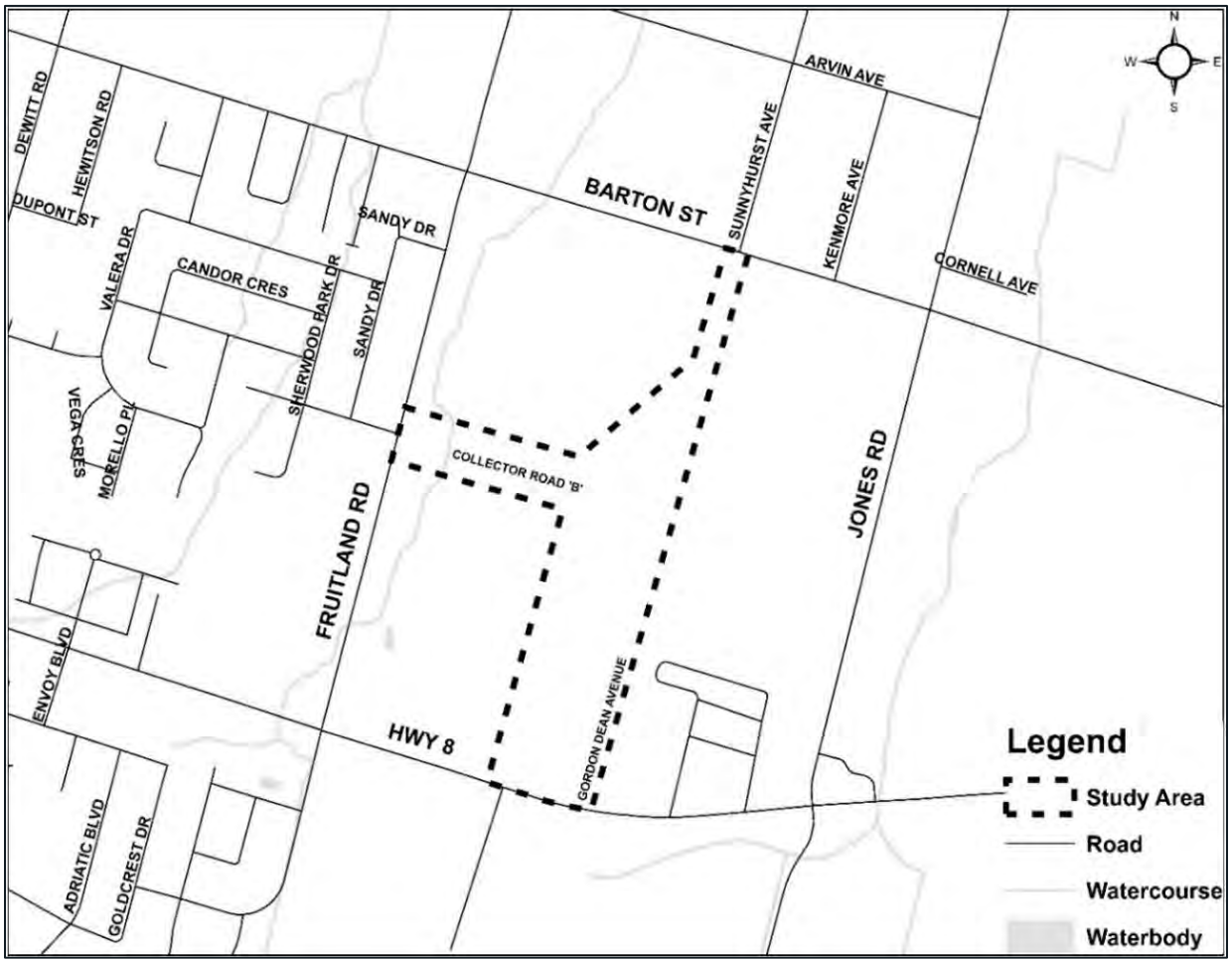


Figure 1.1. Study Area

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 by-pass 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.

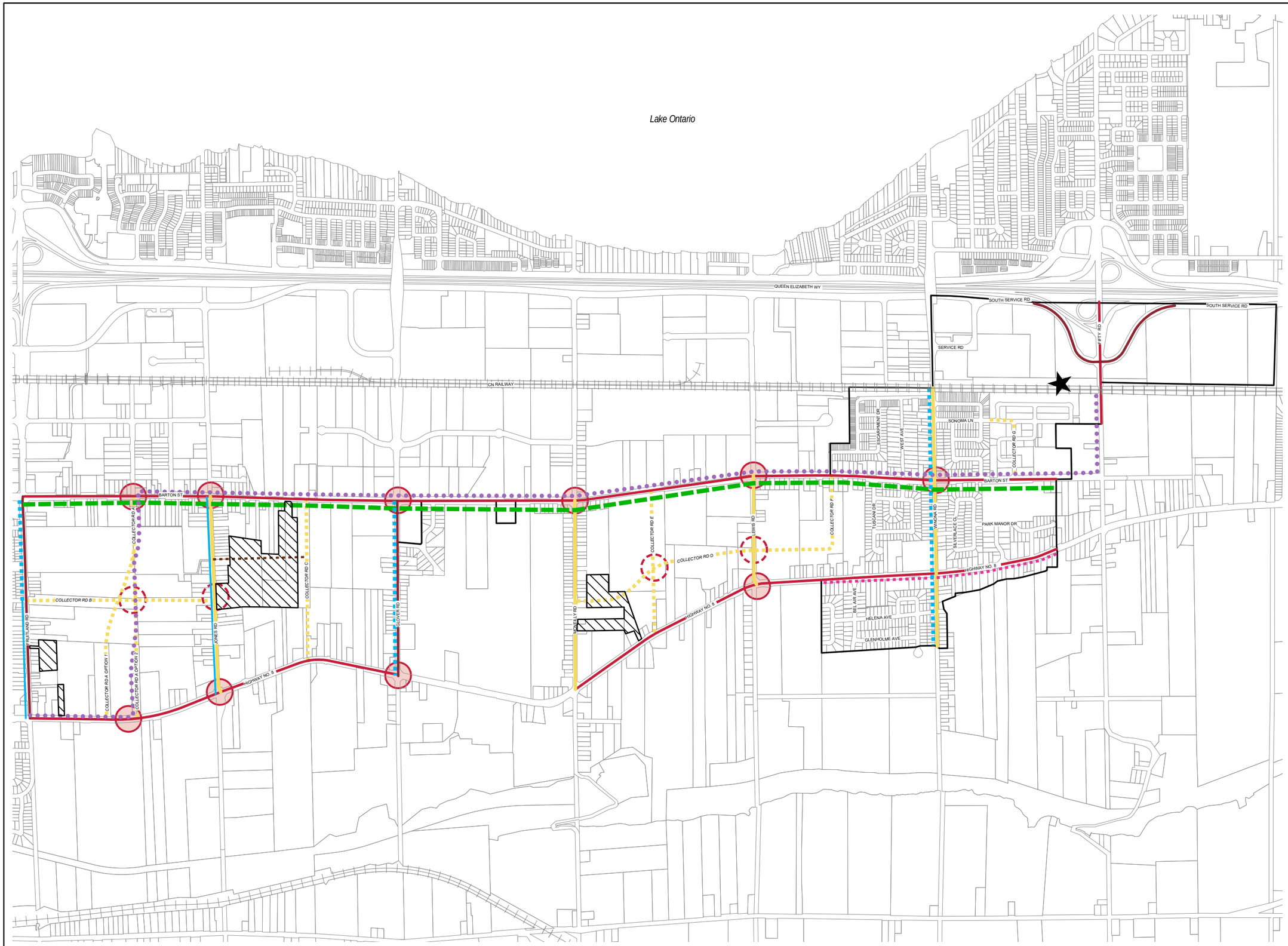
The Secondary Plan provides detailed land use, transportation, and natural heritage system plans and policies for the regulation of land use and development within the Secondary Plan area. The lands within Fruitland-Winona Secondary Plan study area consist of the lands east of Fruitland Road, north of 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. A Notice of Study Commencement and Joint Public Information Centre was issued by the City of Hamilton for Gordon Dean Avenue Municipal Class EA (Phases 3 and 4) and BSS for Block 1 and 2. The Fruitland – Winona Development Group was the proponent for Gordon Dean Avenue Municipal Class EA (Phases 3 and 4) and BSS for Block 1. The City of Hamilton was the proponent for BSS for Block 2. The City of Hamilton issued the combined notice to efficiently use time and resources of everyone involved. 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-planning/master-plans-class-eas/block-servicing-strategies-stoney-creek-and-gordon-dean-class.

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



APPEALS

Lands Under Appeal
- 238, 252 Jones Road
- 820, 822 Barton Street East
- 212 Fruitland Road
- 228, 244 McNeilly Road
- 667, 1069 Highway No. 8

Legend

- Major Arterial
- Minor Arterial
- Collector

Proposed Roads

- Collector
- Potential Roundabout Location
- Potential Intersection Control

Other Features

- Existing On-Street Bike Route
- Proposed Extension of On-Street Bike Route
- Proposed Bike Lane/Paved Shoulder/Shared Lane
- Barton Street Pedestrian Promenade
- Multi-use Trail
- Future Multi-Modal Transportation Hub
- Potential Rapid Transit Route
- Railways
- Secondary Plan Boundary

Notes:
1. All proposed collector roads will have bike lanes.

2. Potential for turning lanes, modern roundabout or traffic signal at Arterial/ Collector Road intersection.

3. Future Multi-Modal Transportation Hub for conceptual purposes only, exact location to be determined.

Urban Hamilton Official Plan
Fruitland-Winona Secondary Plan
Transportation Classification Plan
Map B.7.4-3

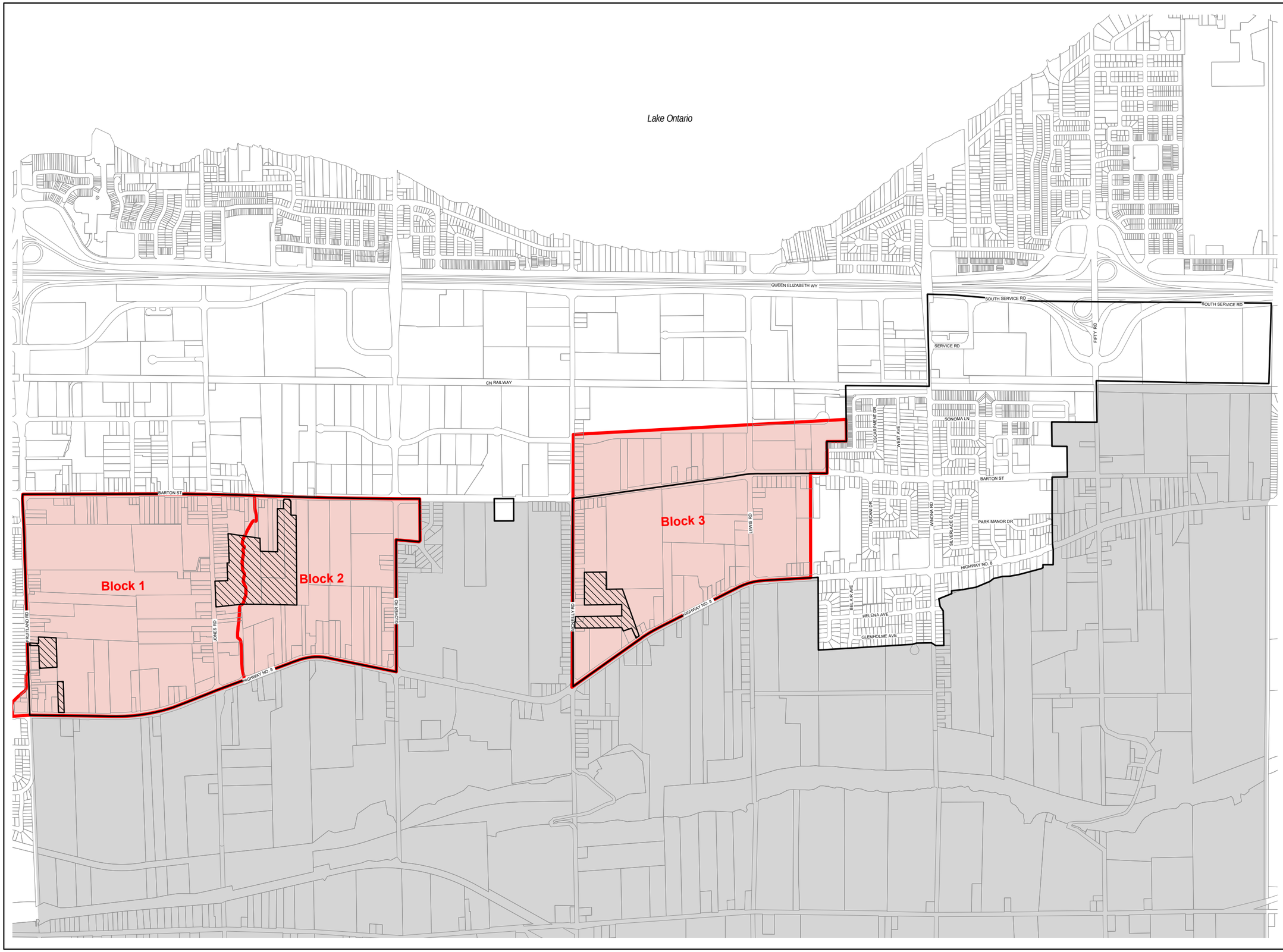
Not To Scale

Date: July 22/2018

Hamilton

PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT

©Teranet Land Information Services Inc. and its licensors. [2011] May Not be Reproduced without Permission. THIS IS NOT A PLAN OF SURVEY



APPEALS

Lands Under Appeal
- 238, 252 Jones Road
- 820, 822 Barton Street East
- 212 Fruitland Road
- 228, 244 McNeilly Road
- 667, 1069 Highway No. 8

Legend

Servicing Strategy Area

Other Features

Lands in the Rural Area

Proposed Roads

Secondary Plan Boundary

Urban Hamilton Official Plan
Fruitland-Winona
Secondary Plan
Block Servicing Strategy
Area Delineation
Map B.7.4-4

Not To Scale

Date: Nov. 23, 2018

Hamilton

PLANNING & ECONOMIC DEVELOPMENT DEPARTMENT

©Teranet Land Information Services Inc. and its licensors. [2011] May Not be Reproduced without Permission. THIS IS NOT A PLAN OF SURVEY

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 3.1. Consultation Schedule

Type	Date
Kick-off Meeting	August 18, 2015
Notice of Study Commencement and PIC #1, published in newspaper and mailed to Study Mailing List (which included government agencies) and City of Hamilton Councillors	Newspaper Advertisement: March 24 and March 31, 2017 Mail-out to City of Hamilton Councilors: March 10, 2017
PIC #1	April 4, 2017
Notice of PIC #2, published in newspaper and mailed to Study Mailing List (which included government agencies and landowners)	Newspaper Advertisement: March 23 and March 30, 2017 Mail-out: October 9, 2019
Technical Agency Committee Meeting	October 10, 2019
PIC #2	October 17, 2019

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 C**.

3.2 Notice of Study Commencement

A Notice of Study Commencement and Joint Public Information Centre was issued by the City of Hamilton for Gordon Dean Avenue Municipal Class EA (Phases 3 and 4) and BSS for Block 1 and 2. The Fruitland – Winona Development Group was the proponent for Gordon Dean Avenue Municipal Class EA (Phases 3 and 4) and BSS for Block 1. The City of Hamilton was the proponent for BSS for Block 2. The City of Hamilton issued the combined notice to efficiently use time and resources of everyone involved. The notice, 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. 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 3.2. PIC #1 - Summary of Comments and Responses

Comment Received Summary	Responses
Comment Form	
Road widening of Fruitland Road How wide? Will it take part of my property and how much? Widening will not work at the current plan I have heard tonight? It will go into my house it will go to plan?	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 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.
Creek Channelization The creek leaving our property will impact our value. The area where the cheek 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	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

Table 3.2. PIC #1 - Summary of Comments and Responses

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

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 won 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 3.3. PIC #2 - Summary of Comments and Responses

Comment Received Summary	Responses
Comment Form	
What are your thoughts on the preliminary preferred alternative (Option 4b)? Natural Environment: Fill the ditch Socio-economic: No honks Archaeology, Cultural and Built Heritage: Fruit farms to be affected Governance: N/A Sustainability / Active Transportation: Need lanes for walks and cycling and transit 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.	Thank you for your comments. 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: 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: The construction of Gordon Dean Avenue will not impact fruit farms. Please refer to Section 7.3 for more information. 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.

Table 3.3. PIC #2 - Summary of Comments and Responses	
Comment Received Summary	**Responses**
What are your thoughts on the preliminary preferred alternative (Option 4b)? Natural Environment: Please protect wildlife/birds/water Socio-economic: Parks! Please lots of greenspace. Proper sidewalks. Slow down drivers. 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	Thank you for your comments. 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. 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.

Table 3.3. PIC #2 - Summary of Comments and Responses	
Comment Received Summary	**Responses**
Verbal Comments	
Drainage Culvert overflows during heavy rain	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.
Block 1 Study Area Clarify the study area map (i.e., what is the Block 1 BSS study area?)	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.
Relationship between Gordon Dean Avenue Class EA and Highway 8 Class EA Why is the Highway 8 project separate from the Gordon Dean Avenue project?	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.
Timeframe for Construction Several attendees asked about the timeframe for construction and the lack of transparency about timelines.	The timeline for construction is not yet confirmed. The proponent constructing Gordon Dean Avenue, south of Collector Road 'B' is not confirmed.
Property Acquisition Questions raised over the possibility of property acquisition	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 6.1.9 for more information.
Truck Traffic Residents on Barton St. expressed the desire to leave this area due to the high volume of truck traffic	Noise impact will be addressed during detailed design. Please refer to Section 7.7 for more information.
Species at Risk Why wasn't deer and other animals currently present in the study area not identified?	Only species identified as species at risk found within the Study Area during field surveys or desktop surveys were

Table 3.3. PIC #2 - Summary of Comments and Responses

Comment Received Summary	Responses
	presented at the PIC. Please refer to Section 4.3 for more information.
Road Geometry The preferred alignment is too straight. Curves are preferred to slow down traffic.	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.
Problem and Opportunity Statement 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.	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.

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**.

Based on Wood's experience with City of Hamilton engagement process and other area projects, Wood contacted the following Indigenous communities that may have an interest in the Project.

- Six Nations of the Grand River (SNGR);
- Mississaugas of the Credit First Nation (MCFN); and
- Haudenosaunee Confederacy Chiefs Council (as represented by the Haudenosaunee Development Institute (HDI)).

On October 1, 2019, an email including an introductory letter, Project Information Sheet and Notice of PIC #2 were sent to these Indigenous groups.

On October 2, 2019, 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 environmental and/or archaeological assessment fieldwork is undertaken.

Follow-up calls to SNGR and HDI were made the weeks of October 19 and November 11, 2019 with messages left. Wood made additional follow-up phone calls on March 19, 2020 to provide an update on the Project.

An additional email was sent to these Indigenous communities 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.

On August 28, 2020, MCFN sent a letter to Wood in response to the initiation of Stage 1 Archaeological Assessment for this Study. MCFN requested project information, including history and current status of environmental and archaeological fieldwork. MCFN letter also note that MCFN has not been properly consulted on this project. MCFN further clarified that Field Liaison Representatives must be present when the environmental and/or archaeological assessment fieldwork is undertaken.

On September 11, 2020, Wood provided a response to MCFN outlining the engagement conducted with MCFN for this study (including Wood's correspondence of October 1, 2019 and May 28, 2020). Wood informed MCFN that a Stage 1 Archaeological Assessment and Cultural Heritage Landscapes Checklist were being completed at the time. Wood's response also noted that the Environmental Study Report will include a commitment that MCFN Field Liaison Representatives are to be involved in Stage 2 Archaeological Assessment (and any additional archaeological fieldwork) during detailed design phase of this project.

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.

3.5 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

Date	Participants	Meeting Summary
Pre-Class EA Initiation Organizational Meetings		
August 11, 2015	City of Hamilton and Wood	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.
December 1, 2016	City of Hamilton and Wood	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'.
February 6, 2017	City of Hamilton and Wood	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'.

Table 3.4. Summary of Meetings with the City of Hamilton		
Date	**Participants**	**Meeting Summary**
Gordon Dean Class EA Process Meetings		
April 19, 2018	City of Hamilton, HCA, Fruitland – Winona Development Group and Wood	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 intersection can be determined at the detailed design phase.
July 23, 2018	City of Hamilton, Fruitland – Winona Development Group and Wood	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

Table 3.4. Summary of Meetings with the City of Hamilton

Date	Participants	Meeting Summary
		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 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.
March 7, 2019	Hamilton City Councillor (Ward 10), Fruitland – Winona Development Group and Wood	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 alternative alignment assessment and the scope of the Class EA. 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.
March 27, 2019	City of Hamilton, Fruitland – Winona Development Group and Wood	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

Table 3.4. Summary of Meetings with the City of Hamilton

Date	Participants	Meeting Summary
		the final deliverable including standard roll plans, design considerations and construction of Gordon Dean Avenue.
May 27, 2019	City of Hamilton, Fruitland – Winona Development Group and Wood	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 (now owned by City of Hamilton for Public Works Facility), 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, Economic and Acquisition of Lands in the approach to the assessment and criteria applied. With accommodation of these adjustments, a modified reassessment was agreed to be undertaken.
June 27, 2019	Hamilton City Councillor (Ward 10), Fruitland – Winona Development Group and Wood	The purpose of this meeting was to keep the City of Hamilton Councillor of Ward 10 (Maria Pearson), informed about the Study by providing a status update for the Study, cost of purchasing 716, 718 and 720 Barton Street East and updated PIC timeline target.
July 15, 2020	Hamilton City Councillor (Ward 10), City of Hamilton Staff, Fruitland – Winona Development Group and Wood	The meeting was held for the City of Hamilton Staff to discuss their written comments on the draft Gordon Dean Avenue ESR and next steps. City's comments on draft ESR were provided in two documents: 1) a letter outlining City staff's general comments, and 2) a comment-response table that included City staff's detailed comments. City staff indicated that they have two roles to play in this EA process: that of EA process facilitator and also a land holder/stakeholder. The City staff noted that it will be in Proponent's interest that the ESR goes to the Council for endorsement so that both projects (Gordon Dean and BSS 1) have a clear way forward. City staff's comments on the Draft ESR were intended to refine the ESR to facilitate timely approval once submitted to regulatory agencies and stakeholders during the mandatory public review period. City staff indicated that they support the Preferred Alternative 4b discussed in the ESR, but that they are seeking compensation, possibly via a land swap for what the City feels is a loss of potential cemetery

Table 3.4. Summary of Meetings with the City of Hamilton

Date	Participants	Meeting Summary
		expansion lands. Correspondence received from Margaret Fazio (dated July 14, 2020) indicated that City staff would support the Preferred Alternative 4b on the premise that suitable compensation be made to the City for the land taking, acquisition of alternate site for Cemetery expansion and the inability to expand the cemetery. The Proponent made it clear that tying the compensation issue to the approval of the ESR was not appropriate and that they were not prepared to discuss the compensation at this time. The City staff confirmed that staff's recommendation report will need to address two issues: recommendation for approval of the Gordon Dean Avenue ESR, and Council to direct the staff to negotiate with the Proponent regarding land swap/compensation. Wood staff noted that this matter of land acquisition along the southern leg of Gordon Dean Avenue was raised in October 2019 and that a meeting was requested with the City. The City declined the meeting at that time, confirming that the discussions were not necessary with respect to advancing the Class EA process. The City staff indicated that the Proponent requires the south leg of Gordon Dean Avenue to be implemented in order to develop their lands however the proponent stated that this is not the case and that the City has previously agreed that the proponent may develop their lands while only constructing the north half of Gordon Dean Avenue. The City staff added that the ESR does not have to define who will be responsible for the construction of the south leg of Gordon Dean, this can be determined at a later stage. It is the City's preference that the entire Gordon Dean Avenue is constructed at once. The City is looking at the project differently now that the City is the landowner. City staff will be initiating discussion internally as to how to obtain compensation for City's land loss. There are options for lands for Cemetery expansion. The process of lands swap, purchase, and compensation to be led by the City following Council written direction to do so. It would be ideal for the City that the Proponent construct

Table 3.4. Summary of Meetings with the City of Hamilton		
Date	**Participants**	**Meeting Summary**
		the road in its entirety and that the City would like to work with the group to facilitate that plan. The City staff added that there will be some level of compensation paid to the Proponent for the approximate $4 million paid for the three homes on Barton Street through which Gordon Dean Avenue will pass. It may be proportionate based on 10m of the 36m road allowance width and will be paid for construction cost as well as land purchase costs. The precise details will be worked out in the future.
November 9, 2020 and November 10, 2020	City of Hamilton Staff	The purpose of these meetings was to review Wood's responses to the City of Hamilton's comments on Draft 2 of the Environmental Study Report. The City of Hamilton had provided comments to Wood on Draft 2 of the report in a letter dated October 15, 2020.

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	
Date	**Meeting Summary**
April 19, 2018	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 & 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.

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

Type	Agency
Conservation Authorities	Hamilton Conservation Authority (0)
Provincial Government	Ministry of the Environment, Conservation and Parks (0)
	Ministry of Transportation (0)
	Ministry of Natural Resources and Forestry (0)
	Ministry of Tourism, Culture and Sport (1)
	Ministry of Municipal Affairs and Housing (0)
Municipality	City of Hamilton (4)

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 (now owned by City of Hamilton for Public Works Facility), the justification for Option 4b as the preliminary preferred option, the pond located at the north-eastern portion of the former Alectra lands (now owned by City of Hamilton for Public Works Facility), 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 Review of the Draft Environmental Study Report

The draft Environmental Study Report was circulated to the City of Hamilton, Hamilton Conservation Authority, Ministry of Heritage, Sport, Tourism and Culture Industries, and Ministry of the Environment, Conservation and Parks for review. This opportunity for review of the draft report was provided before the formal public review period and issuance of Notice of Completion. The draft report was sent via email on June 12, 2020

and comments were requested by July 14, 2020. Responses to the comments received from the City of Hamilton, Hamilton Conservation Authority, and Ministry of Heritage, Sport, Tourism and Culture Industries were sent to these parties on September 1, 2020. Updated draft Environmental Study Report was also sent to the City of Hamilton. In addition, tables of disposition of comments were sent to the Ministry of the Environment, Conservation and Parks on September 1, 2020.

On September 23, 2020, the City of Hamilton staff presented the Staff Report (PED20149) for the draft Environmental Study Report for Gordon Dean Avenue at the General Issues Committee meeting (#20-014), with following recommendation:

> *That the Gordon Dean Avenue Phases 3 and 4 Municipal Class Environmental Assessment's Draft Environmental Study Report be endorsed and that the General Manager of Planning and Economic Development Department be authorized and directed to advise the project proponent (Fruitland-Winona Development Group) to file the Environmental Study Report on the public record for a minimum thirty-day public review, subject to satisfactorily addressing staff comments.*

The draft Environmental Study Report was endorsed by the General Issues Committee on September 23, 2020.

On October 15, 2020, the City of Hamilton staff provided minor comments on the draft Environmental Study Report. Responses to the City of Hamilton's comments were shared with the City staff at the meetings on November 9, 2020 and November 10, 2020. Additional clarifications/comments were provided by the City staff at these meetings. Those clarifications/comments were also incorporated into this report.

Complete documentation of the draft Environmental Study Report review is provided in **Appendix C**. This documentation includes: Comment-response tables, City of Hamilton Staff Report (PED20149), minutes of the General Issues Committee meeting (#20-014), and minutes of the Environmental Study Report review meetings of November 9, 2020 and November 10, 2020.

3.6 Utility 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 3.6. 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

The socio-economic environment for the Study Area is discussed below. The Preferred Land Use Plan for the Fruitland-Winona Secondary Plan area is discussed in detail in Fruitland-Winona Secondary Plan Summary Report (City of Hamilton, 2013b).

4.2.1 Land Use

4.2.1.1 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 property for the Public Works Facility and expansion of the Mountview Gardens Cemetery. The City of Hamilton property was purchased from Alectra Utilities Corporation in 2019 for the proposed Transportation, Operations and Maintenance facility and expansion of the Mountview Gardens Cemetery and is referred to as the "City of Hamilton property for Public Works Facility (lands formerly owned by Alectra Utilities)" 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).

4.2.1.2 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.

4.2.2 Municipal Plans

4.2.2.1 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 for more details.

4.2.2.2 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 B of the UHOP illustrates the City-wide Natural Heritage System that has been developed and included within the UHOP. A summary of review of Schedule B of the UHOP is provided below:

- Schedule B - Natural Heritage System illustrates City-wide Core Areas, Area Specific Policies, Linkages, Parks & General Open Space, and Streams. Schedule B indicates that these features do not exist in the Study Area.
- Schedule B-1 – Detailed Natural Heritage Features Life Science ANSI illustrates City-wide Life Science ANSIs. Schedule B-1 indicates that these features do not exist in the Study Area.

- Schedule B-2 – Detailed Natural Heritage Features Significant Woodlands illustrates City-wide Significant Woodlands. Schedule B-2 indicates that these features do not exist in the Study Area.
- Schedule B-3 – Detailed Natural Heritage Features Alvar and Tallgrass Prairie is applicable to Rural Hamilton Official Plan area, and accordingly does not reflect the study area site conditions.
- Schedule B-4 – Detailed Natural Heritage Features Key Hydrologic Feature Wetlands illustrates City-wide Wetlands. Schedule B-3 indicates that these features do not exist in the Study Area.
- Schedule B-5 – Detailed Natural Heritage Features Lakes and Littoral Zones illustrates City-wide Lakes and Littoral Zones. Schedule B-5 indicates that these features do not exist in the Study Area.
- Schedule B-6 – Detailed Natural Heritage Features Environmentally Significant Areas illustrates City-wide Environmentally Significant Areas. Schedule B-6 indicates that these features do not exist in the Study Area.
- Schedule B-7 – Detailed Natural Heritage Features Local Natural Area Earth Science ANSI illustrates City-wide Earth Science ANSIs. Schedule B-7 indicates that these features do not exist in the Study Area.
- Schedule B-8 – Detailed Natural Heritage Features Key Hydrologic Features Streams illustrates City-wide Streams. Schedule B-8 shows a stream (Watercourse 5.0) in the Study Area.

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.

In addition to above, 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. A summary review of various maps of the Fruitland-Winona Secondary Plan is provided below:

- Map B.7.4-1 - Land Use Plan illustrates the Land Use Plan for the secondary plan area. The Land Use Plan indicates that the land uses along Gordon Dean Avenue and Collector Road 'B' include low and medium density residential, community park, general open space, institutional, and utility.
- Map B.7.4-2 - Natural Heritage System illustrates the detailed Natural Heritage System within the secondary plan area. The map shows that Study Area for this EA overlaps with a Linkage (WC-5.0) designation. It should be noted that habitat for threatened and endangered species, and Significant Wildlife Habitat, also represent Core areas but are not specifically mapped in the UHOP for confidentiality reasons.
- Map B.7.4-3 - Transportation Classification Plan illustrates the existing and proposed transportation network within the secondary plan area. The map identifies Gordon Dean Avenue as a Potential Rapid Transit Route.

4.2.2.3 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 multi-use path. This is further detailed in Section 6.1.3 and 6.1.6.

4.2.3 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
- Provincial Policy Statement (2020).

These documents were reviewed to ensure the Class EA study is in line with the policies.

4.2.3.1 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.

4.2.3.2 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.

4.2.3.3 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 PPS is issued under the authority of Section 3 of the *Planning Act*. Note that the current PPS (2020) came into effect on May 1, 2020, and replaced the PPS issued on April 30, 2014. Section 3 of the PPS requires that decisions affecting planning matters "shall be consistent with" policy statements under the *Planning Act*.

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: g) 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):

- "1.6.7.1 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 7.8, 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.

Section 2.1 of the PPS (2020), which relates specifically to natural heritage, includes clear direction on the adoption of an ecosystem approach, and the protection of resources that have been identified: significant wetlands, significant woodlands, significant valleylands, significant wildlife habitat (SWH), significant areas of natural and scientific interest, habitat(s) of endangered or threatened species, and fish habitat. PPS Section 2.1.1 states that "*natural features and areas shall be protected for the long term*". Additionally, Section 2.2 includes policies for planning authorities to protect, improve or restore the quality and quantity of water.

There are no identified provincially significant wetlands, significant woodlands, or significant valleylands within the EA Study Area that are protected under Section 2.1 of the *Provincial Policy Statement*. There is one Candidate category of SWH present along Watercourse 5.0 (for Snapping Turtle) as well as in open areas of the EA Study Area (for Monarch). Note that this habitat is not confirmed as these species were not observed and the City of Hamilton has not yet developed its own criteria for SWH. However, with the mitigation measures described later in the report, if habitat for these species is confirmed, then associated habitat impacts be addressed accordingly during the design and construction phase. Additionally, three Endangered or Threatened species were observed within the EA Study Area: Barn Swallow, Bobolink and Eastern Meadowlark. Any damage to or removal of their habitats for the proposed development will need to be compliant with the Endangered Species Act, with determination to be confirmed through consultation with MECPP.

Additionally, the Study Area overlaps with WC-5.0 which is recognized in this Study as indirect fish habitat, and accordingly addressed with impact mitigation that focuses on maintenance or enhancement of ecological function as described in section 7.2.2.

4.2.4 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. Schedule C-2 – Future Right-of-Way Dedications of the Urban Hamilton Official Plan identifies future Right-of-Way width for Highway 8 from Donn Avenue to East City Limits to be 36.576 m. Section C.4.5.6 – (Right-of-Way Dedications (OPA 109)) of Volume 1, Chapter C – City Wide Systems and Designations notes that "the City shall reserve or obtain right-of-way dedications as described in Schedule C-2 – Future Right-of-Way Dedications."
- **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. Schedule C-2 – Future Right-of-Way Dedications of the Urban Hamilton Official Plan identifies future Right-of-Way width for Barton Street from Fruitland Road to Eastern urban boundary to be 40.576 m.
- **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.

4.2.5 Existing Traffic Conditions

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**.

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 4.1.

Table 4.1. Level of Service and Description of Operations

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

These conditions are not considered sufficiently deficient to warrant remedial measures.

4.2.6 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 4.2.2.3, 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.

4.2.7 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 (i.e., 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.
- Stoney Creek Urban Boundary Expansion (SCUBE) East Subwatershed Study Final Report; prepared for the City of Hamilton by Aquafor Beech, May 15, 2013.
- SCUBE Subwatershed Study: Implementation; prepared for the City of Hamilton by Aquafor Beech, May 15, 2013.
- Fruitland-Winona Block 1 Servicing Strategy Environmental Assessment and Natural Heritage System Plan (Draft); prepared for the City of Hamilton by D&A, September 2017.
- Natural Heritage Information Centre (NHIC) Online Make-a-Map for SAR records.
- Ontario Ministry of Natural Resources and Forestry mapping.
- Urban and Rural Hamilton Official Plans and Schedules, including the Fruitland-Winona Secondary Plan.

- Hamilton Conservation Authority (HCA) Regulation and Mapping.

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

<u>Ecological Land Classification</u>

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/Successional:

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 (i.e., 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 5.0 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 OMNRF (OMNRF 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. 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. 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. 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 (i.e., 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 (i.e., 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 (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 (i.e., 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 City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). 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 (i.e., Eastern Wood-Pewee). The full SAR screening as completed is provided in the EIA (**Appendix E**).

<u>Incidental Wildlife Sightings</u>

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 Sranks 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

Linkages

The Fruitland-Winona Secondary Plan - Map B 7.4-2 (Natural Heritage System) identifies Watercourse 5.0 as a Linkage within the Secondary Plan area. Linkages are natural areas within the landscape that ecologically connect Core Areas. Connections between natural areas provide opportunities for plant and animal movement, hydrological and nutrient cycling, and maintain ecological health and integrity of the overall Natural Heritage System. The City of Hamilton recognizes the importance of Linkages shown on Schedule B (Natural Heritage System) of the Urban Hamilton Official Plan in reducing the adverse impacts of habitat fragmentation on natural areas. Habitat fragmentation results in loss of species diversity and reduced ecosystem health and resilience. Urban Hamilton Official Plan provides policy directive that Linkages be protected, restored, and enhanced to sustain the Natural Heritage System wherever possible.

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 (i.e., 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. Fish habitat (which is represented by Watercourse 5.0), Significant Wildlife Habitat (candidate habitat for Snapping Turtle and Monarch) and wetlands are considered key natural heritage features.

b) **Key Hydrologic Features:** These include wetlands and permanent and intermittent streams. A number of small wetlands are present within the Class EA Study Area. 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.

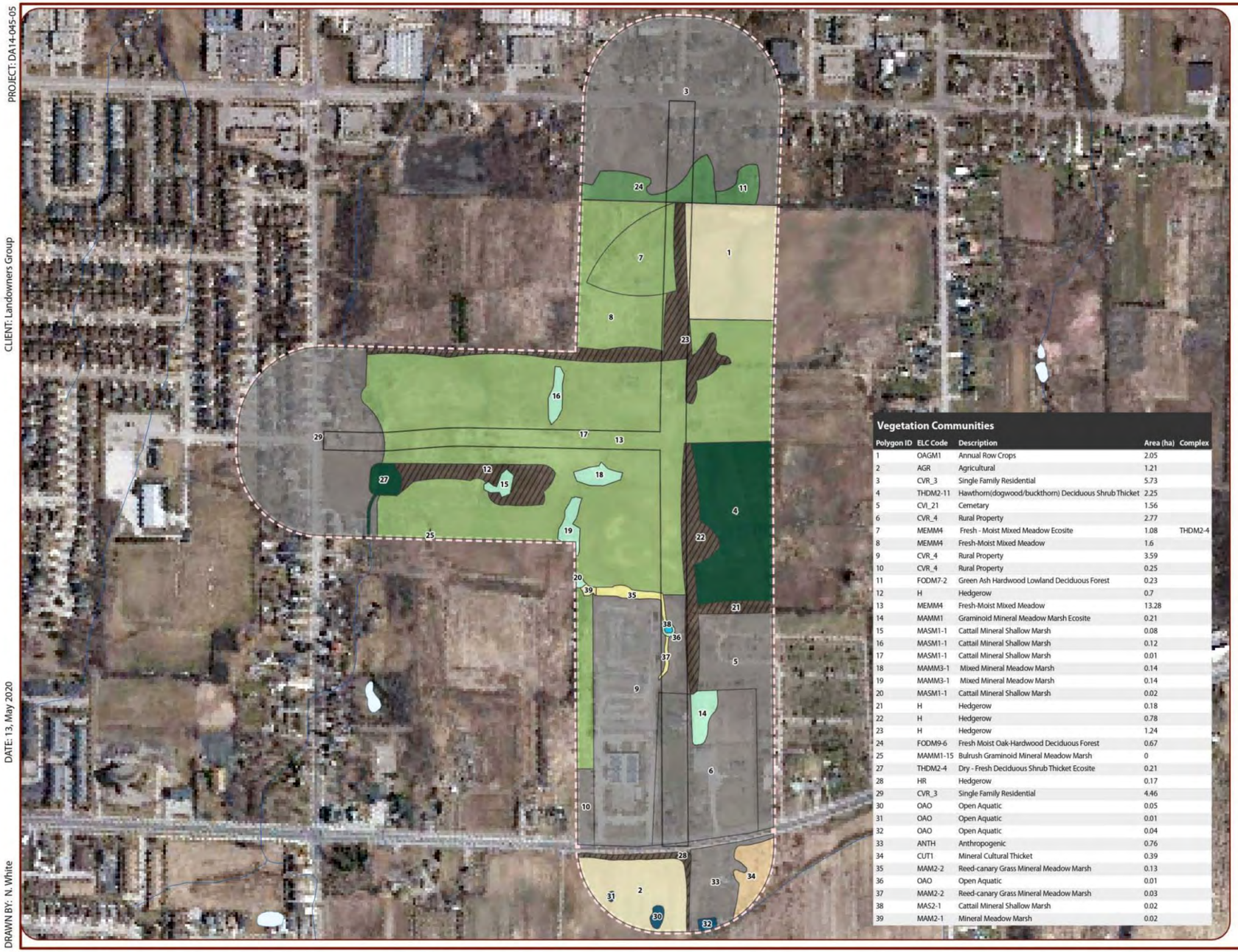
c) **Local Natural Areas:** No Environmentally Significant Areas (ESA) or ANSIs are in the Class EA Study Area. Unevaluated wetlands are present within the Study Area which constitute 'local natural areas' under UHOP.

PROJECT: DA14-045-05

CLIENT: Landowners Group

DATE: 13, May 2020

DRAWN BY: N. White



Map 3: Vegetation Communities

Gordon Dean Avenue Class EA
Environmental Impact Assessment

- Watercourse
- Study Area
- Proposed Road Development

Vegetation Communities

- Agricultural
- Constructed
- Cultural
- Forest
- Hedgerow
- Meadow
- Meadow Marsh
- Open Aquatic
- Open Water
- Marsh
- Thicket

Base Map data © OpenStreetMap contributors, Map layer by Esri, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Orthoimagery: City of Hamilton

0 50 100
Metres
SCALE: 1:5,000

N
UTM Zone 17N NAD83

Disclaimer:
The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should not be relied on as being a precise indicator of locations, features, or roads, nor as a guide to navigation. MNRF data provided by Queen's Printer of Ontario. Use of the data in any derivative product does not constitute an endorsement by the MNRF or the Ontario Government of such products.

Vegetation Communities

Polygon ID	ELC Code	Description	Area (ha)	Complex
1	OAGM1	Annual Row Crops	2.05	
2	AGR	Agricultural	1.21	
3	CVR_3	Single Family Residential	5.73	
4	THDM2-11	Hawthorn(dogwood/buckthorn) Deciduous Shrub Thicket	2.25	
5	CVI_21	Cemetary	1.56	
6	CVR_4	Rural Property	2.77	
7	MEMM4	Fresh - Moist Mixed Meadow Ecosite	1.08	THDM2-4
8	MEMM4	Fresh-Moist Mixed Meadow	1.6	
9	CVR_4	Rural Property	3.59	
10	CVR_4	Rural Property	0.25	
11	FODM7-2	Green Ash Hardwood Lowland Deciduous Forest	0.23	
12	H	Hedgerow	0.7	
13	MEMM4	Fresh-Moist Mixed Meadow	13.28	
14	MAMM1	Graminoid Mineral Meadow Marsh Ecosite	0.21	
15	MASM1-1	Cattail Mineral Shallow Marsh	0.08	
16	MASM1-1	Cattail Mineral Shallow Marsh	0.12	
17	MASM1-1	Cattail Mineral Shallow Marsh	0.01	
18	MAMM3-1	Mixed Mineral Meadow Marsh	0.14	
19	MAMM3-1	Mixed Mineral Meadow Marsh	0.14	
20	MASM1-1	Cattail Mineral Shallow Marsh	0.02	
21	H	Hedgerow	0.18	
22	H	Hedgerow	0.78	
23	H	Hedgerow	1.24	
24	FODM9-6	Fresh Moist Oak-Hardwood Deciduous Forest	0.67	
25	MAMM1-15	Bulrush Graminoid Mineral Meadow Marsh	0	
27	THDM2-4	Dry - Fresh Deciduous Shrub Thicket Ecosite	0.21	
28	HR	Hedgerow	0.17	
29	CVR_3	Single Family Residential	4.46	
30	OAO	Open Aquatic	0.05	
31	OAO	Open Aquatic	0.01	
32	OAO	Open Aquatic	0.04	
33	ANTH	Anthropogenic	0.76	
34	CUT1	Mineral Cultural Thicket	0.39	
35	MAM2-2	Reed-canary Grass Mineral Meadow Marsh	0.13	
36	OAO	Open Aquatic	0.01	
37	MAM2-2	Reed-canary Grass Mineral Meadow Marsh	0.03	
38	MAS2-1	Cattail Mineral Shallow Marsh	0.02	
39	MAM2-1	Mineral Meadow Marsh	0.02	

Figure 4.1. Vegetation Communities

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 (i.e., 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 4.2 and Figure 4.3). 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**.

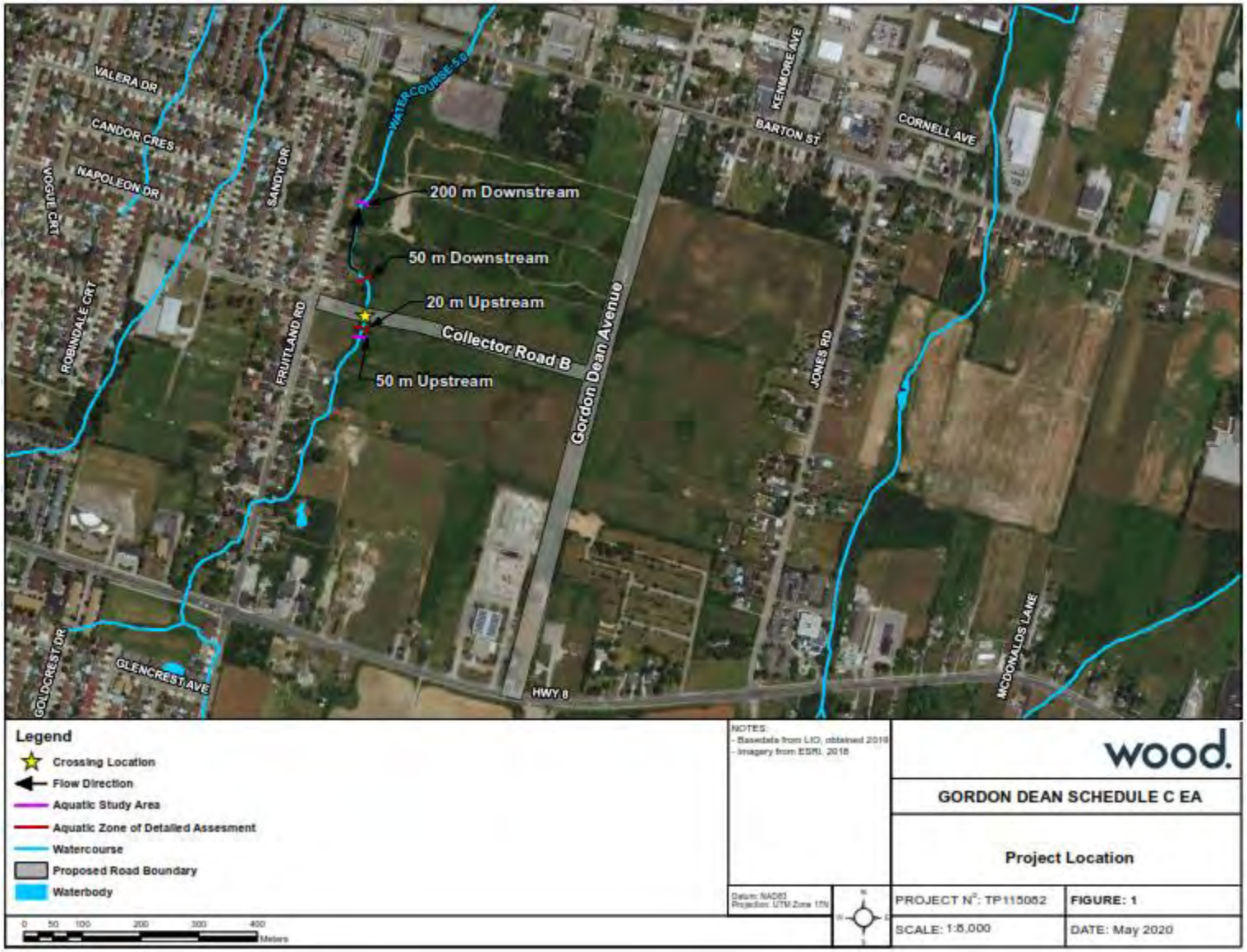


Figure 4.2. Aquatic Assessment Study Area

Figure 4.3. Aquatic Habitat

4.4 Cultural Environment

4.4.1 Archaeological Resources

A Stage 1 Archaeological Assessment Report was completed by Wood in September 2020, and is provided in **Appendix G**. The Stage 1 Archaeological Assessment was carried out in accordance with the Ontario Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) Standards and Guidelines for Consultant Archaeologists (2011) pursuant to the Ontario Heritage Act, R.S.O. 1990, c. O.18. As part of Stage 1 Archaeological Assessment, Wood completed following activities to identify areas of archaeological potential within the Study Area:

- Desktop-based review of various resources, including Ontario Archaeological Sites Database, Ontario Public Register of Archaeological Reports, and City of Hamilton's Archaeological Master Plan;
- A review of previously completed archaeological assessments within and adjacent to the Study Area; and,
- Information gathering from the Bereavement Authority of Ontario and City of Hamilton
- A visual inspection of the study area.

The Stage 1 Archaeological Assessment determined that the study area has general archaeological potential and warrants Stage 2 Archaeological Assessment on those areas (Wood, 2020a). The areas of archaeological potential are illustrated in **Figure 4.5**.

In addition to above, based on engagement with MCFN, Field Liaison Representatives shall be involved in Stage 2 Archaeological Assessment (and any additional archaeological fieldwork) during detailed design phase of this project.

4.4.2 Built Heritage Resources and Cultural Heritage Landscapes

A Cultural Heritage memo was completed by Wood in September 2020 and is provided in **Appendix H**. As part of this this memo, Wood completed following activities to identify recognized heritage properties and potential heritage properties that may be of cultural heritage value within the Study Area:

- Completion of MHSTCI's Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes: A Checklist for the Non-Specialist (the Checklist);
- Desktop-based data collection from various online resources, including City of Hamilton's Cultural Heritage mapping;
- A review of previously completed cultural heritage studies;
- Information gathering from City of Hamilton, Ontario Heritage Trust, and MHSTCI; and,
- A field review of the Study Area.

The completion of above activities determined that the Study Area contains, and is adjacent to, properties with potential cultural heritage value due to the presence of buildings or structures 40 years or older (Wood, 2020b). These properties include:

- 708 Barton Street (demolished)
- 693 Highway No. 8 (BHR1)
- 725 Highway No. 8 (BHR2)
- 735 Highway No. 8 - Mountview Gardens Cemetery (CHL1)

Location of these properties is shown on **Figure 4.5**.

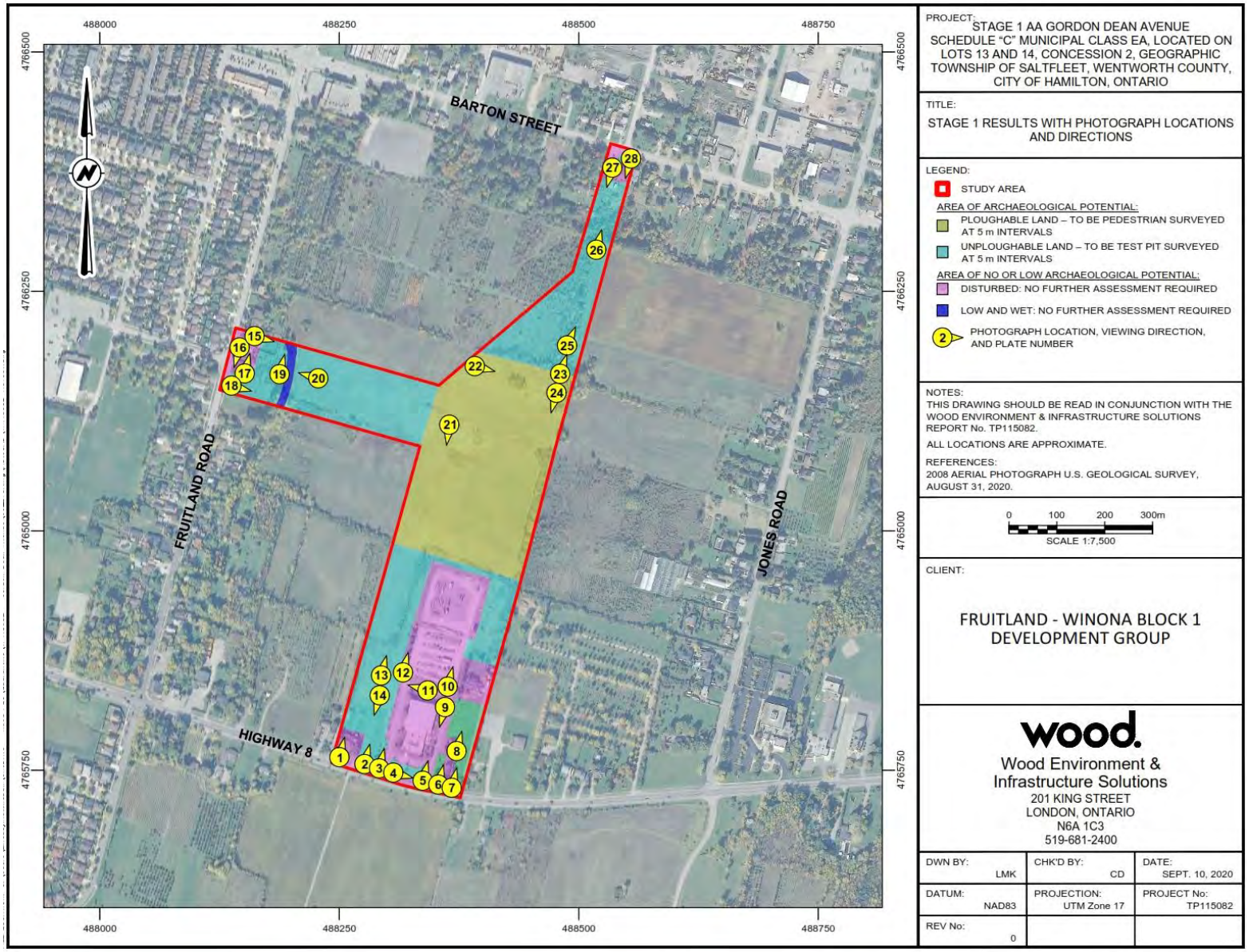


Figure 4.4. Areas of Archaeological Potential

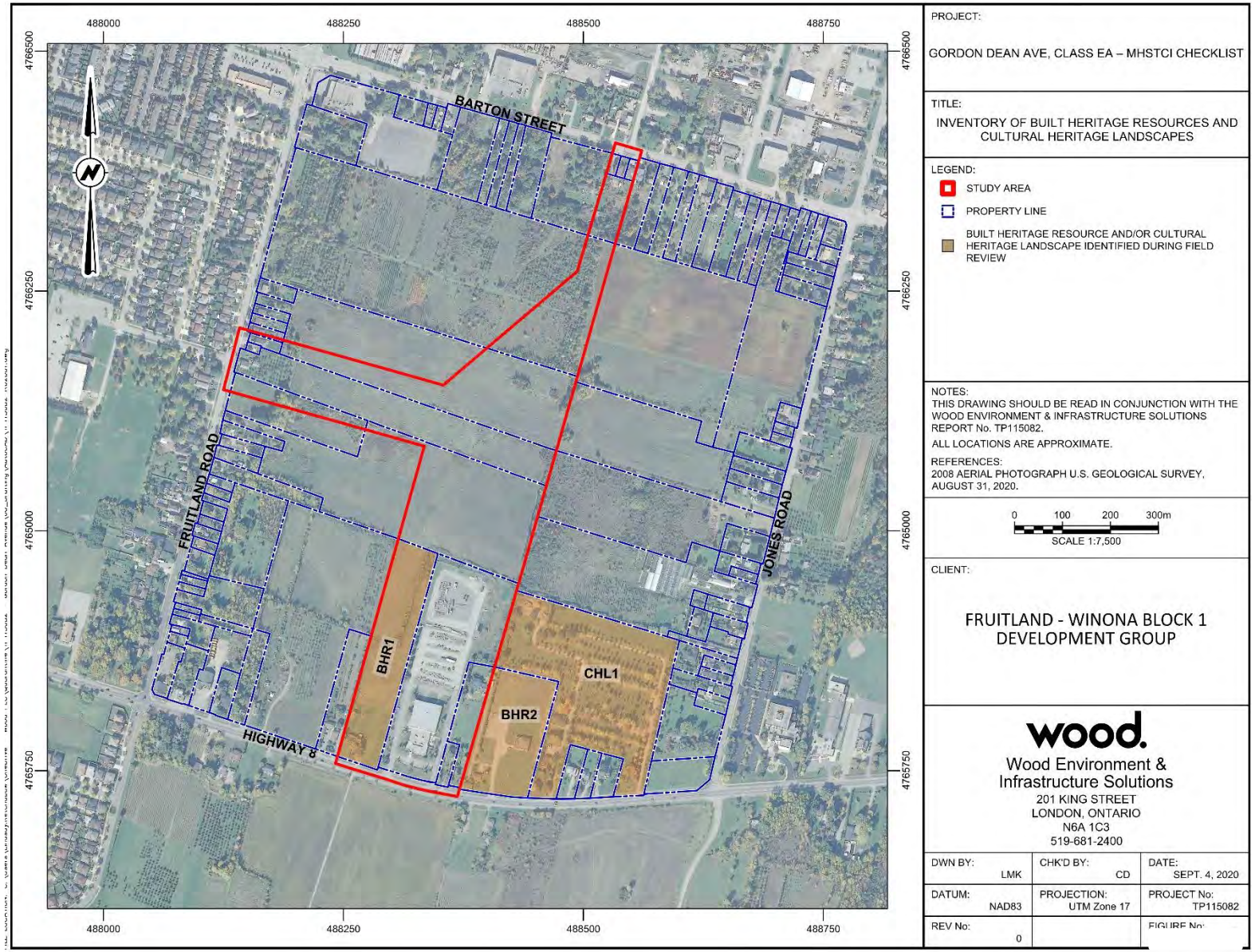


Figure 4.5. Built Heritage Resources

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 6 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 SCUBE East Subwatershed Study Aquafor Beech Limited (Aquafor Beech Limited , 2013) overall Stormwater Management Strategy for SCUBE area. It noted that the LID techniques should be selected and designed to infiltrate target volumes ranging from 1.5 mm to 3 mm over the total catchment area. 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 along with appropriate LID techniques shall be incorporated during the detailed design phase of Gordon Dean Avenue and Collector Road 'B' when the BSS for Block 1 Area is approved.

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 m^2/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 is approved.

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 surface. 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 4.2.

Table 4.2. General Channel Characteristics of Watercourse 5.0

Channel Characteristics	WC-5.0
Bankfull Width (m)	3.2 – 4.9
Maximum Bankfull Depth (m)	0.52 – 1.48
Entrenchment Ratio	>2
Gradient	Low
Sinuosity	Straight
Bank Height (m)	0.5 – 1.48
Bank Angle (degrees)	30 - 50

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 is approved. 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. 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 Alternative Design Concepts (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 Alternative Design Concepts (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 5.1. Evaluation Criteria for Alternatives

Component	Evaluation Criteria	Description
Natural Environment	NHS: Core Areas, including Significant Woodlands, PSWs)	Potential impacts to terrestrial habitat features.
	NHS: Linkages, Restoration Areas, and Vegetation Protection Zones	Potential impacts to terrestrial habitat features.
	Avian SAR	Amount of habitat loss to Bobolink, Eastern Meadowlark and Barn Swallow Habitat.
	Wetlands	Potential impacts to wetlands in Core Areas.
	Non-Core Area Woodlands	Potential impacts to non-core area woodlands.
	Hedgerows and Thickets	Potential impacts to impacts to hedgerows and thickets.
	Avian and Wildlife Resources	Potential impacts to impacts to avian and wildlife resources.
	Candidate Significant Wildlife Habitat (SWH)	Potential impacts to SWH.
	Watercourses	Potential impacts to WC-5.0. (i.e., move, alter, reconfigure, enhance WC-5.0).
	Groundwater Impacts	Potential impacts to ground water quality and/or quantity.
	Hydraulics & Hydrology	Potential impacts to flood potential.
	Stormwater Management and Low Impact Development (LID)	Potential impacts to stormwater quality or quantity.
	Residential Impacts	Number of residents displaced, and amount of residential property required.

Table 5.1. Evaluation Criteria for Alternatives

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

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

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 re-evaluation of alternatives underwent two iterative reviews by the City of Hamilton, as a result of discussions that occurred with the City of Hamilton. Following the second review, the evaluation of alternatives and the preferred alternative was determined to be suitable to present at the PIC #2 held on October 17, 2019. In addition to these two rounds of review, the City of Hamilton provided additional comments on the evaluation of alternatives as part of the review of draft Environmental Study Report (i.e., this report).

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 of alternatives, the City of Hamilton provided the second review of comments on September 6 and September 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 second round of review resulted in the evaluation criteria reflecting a more robust assessment of the area's natural heritage features within the Study Area.

Third Round of Review (during the review of Draft ESR):

The comments received from the City of Hamilton on evaluation of alternatives on September 6 and September 16, 2019, were addressed in the draft ESR. This draft report was provided to the City of Hamilton, HCA, MECP and MHSTCI on June 12, 2020, and comments were requested by July 14, 2020. The City of Hamilton provided additional comments on the evaluation of alternatives on July 15, 2020, as part of the review of the draft ESR. HCA also provided some comments on the evaluation of

alternatives as part of the review of the draft ESR. In response to these comments, edits were made to the evaluation of alternatives table in this report to improve the clarity and refine the evaluation of alternatives. Please note that the edits made to the evaluation of alternatives in this report do not change the outcome of the evaluation of alternatives presented at the PIC#2 in 2019, and as presented in the Evaluation Memo provided as technical detailed evidence in **Appendix I**. The comments received from the City of Hamilton, HCA, MECP and MHSTCI can be found in **Appendix C**.

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'

Alignment Alternatives	General Description
Option 1a – West of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities)	• North-south road (Gordon Dean Avenue) would run west of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). • East-west road would run east from Fruitland Road with curved sections in the west.
Option 2a – Traverse Western Portions of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). East-West Road runs parallel to Barton Street	• North-south road (Gordon Dean Avenue) would traverse western and northern sections of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). • East-west road would align with Sherwood Park Road at Fruitland Road.

Table 5.2. Alignment Alternatives for Gordon Dean Avenue and Collector Road 'B'

Alignment Alternatives	General Description
Option 2b - Traverse Western and northern Portions of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) + Modified East-West Road	• North-south road (Gordon Dean Avenue) would traverse western and northern sections of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) • East-west road would run slightly north of Option 2a from Fruitland Road.
Option 3a - Traverse Central and Eastern Portions of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). East-West Road runs parallel to Barton Street	• North-south road (Gordon Dean Avenue) would traverse central and eastern sections of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities), 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 the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) + Modified East-West Road	• North-south road (Gordon Dean Avenue) would traverse central and eastern sections of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities), including the existing commercial building. • East-west road would run slightly north of Option 3a from Fruitland Road.
Option 4a – East of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). East-West Road runs parallel to Barton Street	• North-south road (Gordon Dean Avenue) would run mostly east of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). • East-west road would align with Sherwood Park Road at Fruitland Road.
Option 4b – East of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) + Modified East-West Road	• North-south road (Gordon Dean Avenue) would run mostly east of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). • 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 I**. 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 an 85º-90º 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**.

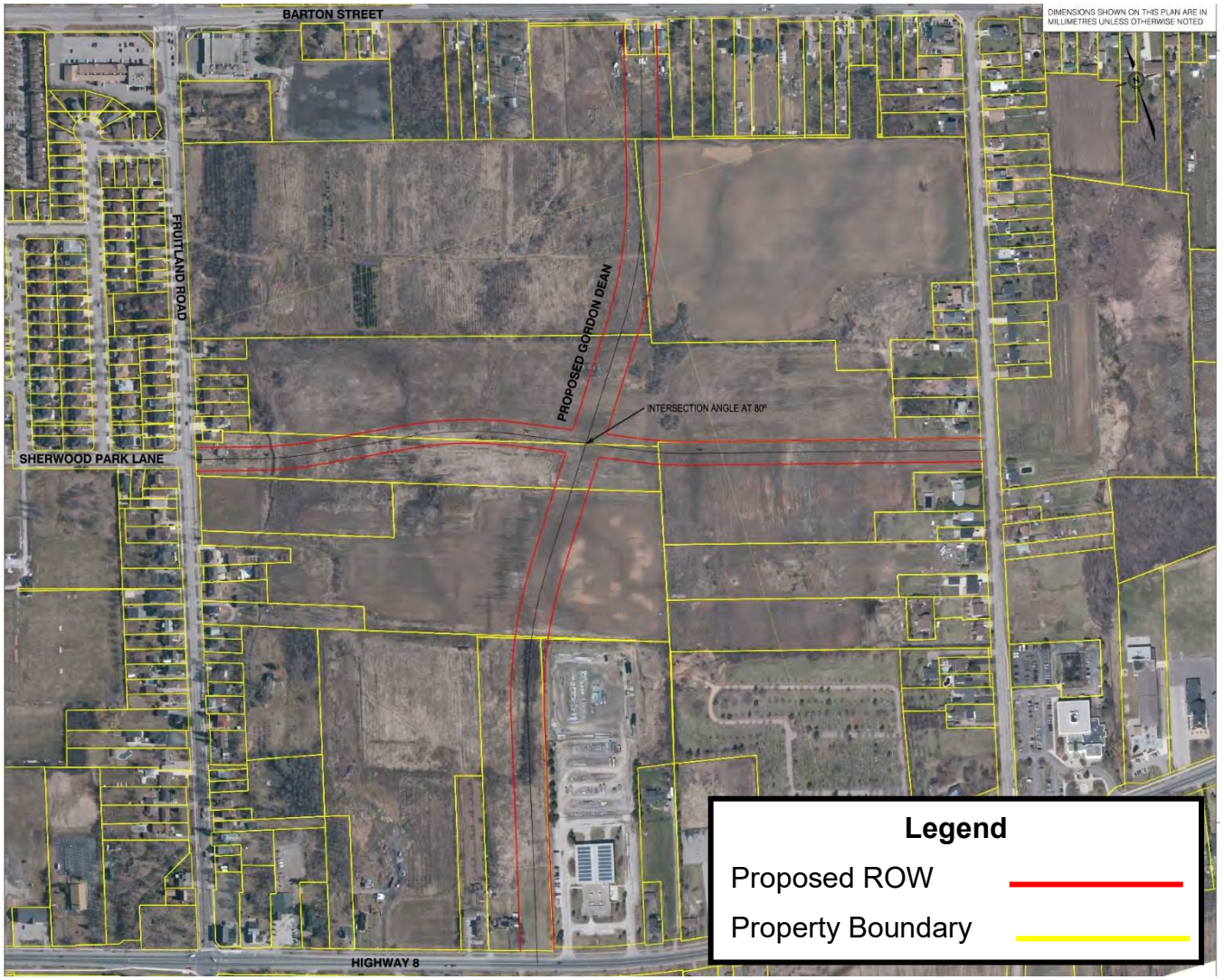


Figure 5.1: Alternative Alignment Option 1a

Legend

Proposed ROW

Property Boundary

Figure 5.2: Alternative Alignment Option 2a

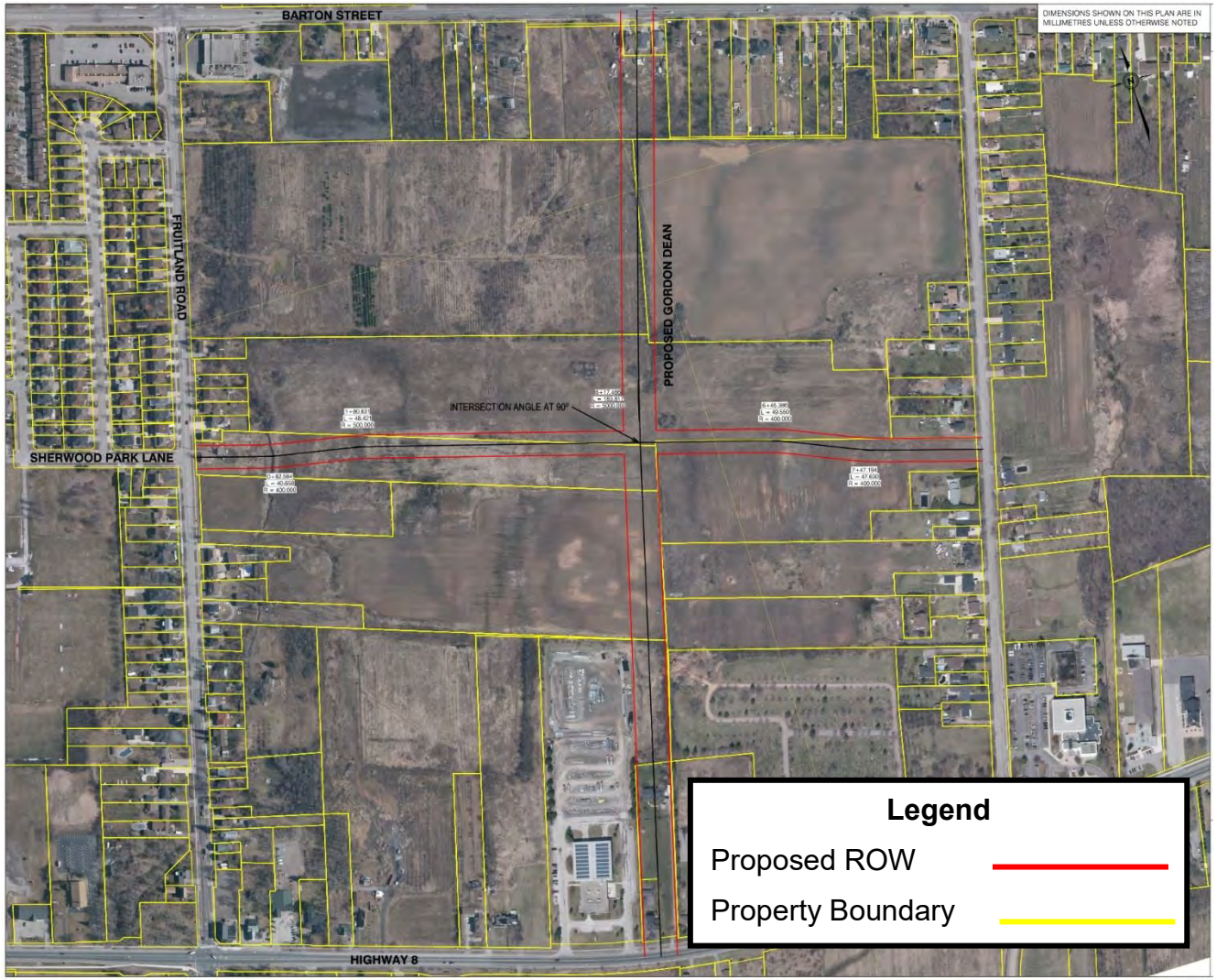


Figure 5.7: Alternative Alignment Option 4b

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;
- Compared to the other alternatives, the Preferred Alternative 4b conforms to the Fruitland-Winona Secondary Plan, both in north-south and east-west corridor alignments;
- Avoids the need to displace existing businesses, 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

Category and Criteria		Indicators		Route 1a	Route 2a	Route 2b	Route 3a	Route 3b	Route 4a	Route 4b
Environment Impacts	NHS: Core Areas, including Significant Woodlands, PSWs, unevaluated wetlands, Watercourse 5.0, Significant Wildlife Habitat, and Species at Risk)	Poor	Direct impacts likely to significant NHS resources	**Neutral:** • 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	Direct impacts likely to terrestrial habitat features; mitigation and/or compensation likely							
		Excellent	No direct impacts to terrestrial habitat features anticipated							
	NHS: Linkages, Restoration Areas, and Vegetation Protection Zones	Poor	Direct impacts likely to significant NHS resources	**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).						
		Neutral	Direct impacts likely to terrestrial habitat features; mitigation and/or compensation likely							
		Excellent	No direct impacts to terrestrial habitat features anticipated							
	Avian (SAR)	Poor	Greater than 30 hectares of Bobolink and Eastern Meadowlark habitat loss; Significant impact to Barn Swallow habitat	**Neutral:** • 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.						
		Neutral	4 to 30 hectares of Bobolink and Eastern Meadowlark habitat loss; Medium impact to Barn Swallow habitat							
		Excellent	Less than 4 hectares of Bobolink and Eastern Meadowlark habitat loss; Low impact to Barn Swallow habitat							
	Wetlands	Poor	Significant impacts to wetlands in Core Areas	**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.						
		Neutral	Impacts to wetlands but not within the Core Areas							
		Excellent	No impacts to wetlands							
	Non-Core Area Woodlands	Poor	Direct impacts to non-core area woodlands, however there are few mitigation and/or compensation opportunities	**Neutral:** • 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.						
		Neutral	Direct impacts to non-core area woodlands, however mitigation and/or compensation possible							
		Excellent	No impacts to non-core area woodlands							

Table 5.3. Evaluation of Alignment Alternatives

Category and Criteria		Indicators		Route 1a	Route 2a	Route 2b	Route 3a	Route 3b	Route 4a	Route 4b
Environment Impacts (cont'd)	Hedgerows and Thickets	Poor	Direct impacts to hedgerows and thickets, however there are few mitigation and/or compensation opportunities	**Neutral:** • 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, thickets can be created in future linkages, RAs, and VPZs.						
		Neutral	Direct impacts to hedgerows and thickets, however mitigation and/or compensation possible							
		Excellent	No impacts to hedgerows and thickets							
	Avian and Wildlife Resources	Poor	Direct impacts to avian and wildlife resources, however there are few mitigation and/or compensation opportunities	**Neutral:** • The categorization of impacts to avian and wildlife resources follows that of "Terrestrial Habitat Features". • 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	Direct impacts to avian and wildlife resources, however mitigation and / or compensation possible							
		Excellent	No impacts to avian and wildlife resources							
	Candidate Significant Wildlife Habitat (SWH)	Poor	Permanent removal of SWH and/or few or no mitigation opportunities	**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	Minimal impacts to SWH; readily replicated, mitigation opportunities within final NHS							
		Excellent	No impacts to SWH							
	Watercourses	Neutral	Moved, altered, reconfigured, enhanced watercourses; eliminated, few mitigation opportunities	**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.						
		Excellent	Remaining watercourses; not crossed and/or no impacts							
	Groundwater Impacts	Poor	Net decrease in ground water quality and/or quantity	**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 change in ground water quality or quantity							
		Good	Net increase in ground water quality or quantity							
		Excellent	Net increase in ground water quality and quantity							
	Hydraulics & Hydrology	Poor	Negatively impacts existing hydraulics / hydrology. Likely to result in increased flood risks	**Neutral:** • No anticipated change to existing hydraulics or hydrology (no change in flood risk).						
		Neutral	No anticipated change to existing hydraulics or hydrology (no change in flood risk)							
		Good	Design will mitigate flood risks associated with significant storm events							
		Excellent	Design will result in elimination of flood risks associated with the 100-year storm event							

Table 5.3. Evaluation of Alignment Alternatives

Category and Criteria		Indicators		Route 1a	Route 2a	Route 2b	Route 3a	Route 3b	Route 4a	Route 4b
Environment Impacts	Stormwater Management and LID	Poor	Negative impacts to existing stormwater management facilities	**Good:** • Improved stormwater quality and quantity handling, including implementation of some LID techniques.						
		Neutral	No net change in stormwater quality or quantity							
		Good	Improved stormwater quality and quantity handling, including implementation of some LID techniques							
		Excellent	Space, groundwater table and geotechnical conditions allow for implementation of advanced LID techniques							
Socio-Economic Impacts	Residential Impacts	Poor	Residents displaced and/or large area of residential property required	**Poor:** • One residence displaced at the southwest corner.			**Excellent:** • No residence displaced.		**Poor:** • Two residences will be displaced.	
		Neutral	No residents displaced but large area of residential property required							
		Good	No residents displaced but some area of residential property required							
		Excellent	No residents displaced and no residential property required							
	Business Impacts	Poor	Businesses displaced and/or large area of commercial property required	**Good:** • No business displacement but western edge of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) may be required.	**Poor:** • Displacing significant portion of lands north of the City of Hamilton property for the proposed TOM facility and cemetery expansion (lands formerly owned by Alectra Utilities) and existing business structure, which has commercial value				**Good:** • No businesses displaced, but a portion of commercial property will be required, located at the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) (northeast portion). This was anticipated in the approved Secondary Plan.	
		Neutral	No businesses displaced but large area of commercial property required							
		Good	No businesses displaced but small area of commercial property required							
		Excellent	No businesses displaced, and no commercial property required							
	Noise Level Impacts	Poor	Increased noise level impact to several residents/businesses	**Neutral:** • Higher noise levels will result from future traffic operations and construction; to be mitigated by noise walls or other measures. • The noise study will be completed during detailed design.			**Good:** • Anticipated noise level impact to planned residential development is reduced relative to other options. • The noise study will be completed during detailed design.			
		Neutral	Modest increase in noise levels to be mitigated.							
		Good	Noise level impact reduced							
		Excellent	Noise level impact significantly reduced							

Table 5.3. Evaluation of Alignment Alternatives

Category and Criteria		Indicators		Route 1a	Route 2a	Route 2b	Route 3a	Route 3b	Route 4a	Route 4b
Socio-Economic Impacts (cont'd)	Access to Community Services	Poor	Potential impact to access community services	**Excellent:** • Direct access to potential community features located on the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities).	**Poor:** • Displacing significant portion of lands north of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) will remove some potential community features.				**Excellent:** • Direct access to potential community features located on the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities).	
		Excellent	Would provide access to future community services							
	Recreational Features Impacts	Poor	Required removal of recreational feature(s)	**Good:** • Improved access to the future community centre and recreational facility, identified in the Block 1 Plan.						
		Neutral	No removal but reduced access to existing recreational feature(s)							
		Good	Improved access to existing recreational feature(s)							
		Excellent	Creation of features and improved access to existing recreational feature(s)							
Archaeological / Built Heritage Impacts	Cultural / Built Heritage Features / Landscapes Impacts	Poor	Significant impacts to cultural or landscape features	**Good:** • No impacts to built heritage features.					**Neutral:** • Alignment immediately abutting Mountview cemetery.	
		Neutral	Minor impacts to cultural or landscape features							
		Good	No impact to cultural or landscape features							
		Excellent	Infrastructure provides additional space for, or highlights, cultural features or landscapes							
	Arch. Impacts	Poor	Significant disturbance to an archaeological site(s) and / or a large area of land deemed to have archaeological potential	**Neutral:** • Archaeological potential found throughout entire Study Area. Stage 2 Assessment is required.						
		Neutral	Disturbance to land deemed to have some archaeological potential							
		Good	No disturbance to archaeological sites or land with archaeological potential							
		Excellent	Mitigation practices put in place to protect archaeological resource / avoid ground disturbance							

Table 5.3. Evaluation of Alignment Alternatives

Category and Criteria		Indicators		Route 1a	Route 2a	Route 2b	Route 3a	Route 3b	Route 4a	Route 4b
Governance	Impacts to Non-Participating Lands	Poor	Significant impacts; acquisitions required	**Medium:** • 1.26 hectares impacted (2 parcels). • Potential acquisition of one residential property west of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities).	**Poor:** • 1.26 hectares impacted (2 parcels). • Potential acquisition of one residential property west of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities). • Partial acquisition of former Alectra lands, which was recently purchased by the City of Hamilton for specific civic use purposes (impact at the north-west corner of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities)).		**Poor:** • 1.26 hectares impacted (1 parcels). • Requires acquisition of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities), which was recently purchased by the City of Hamilton for specific civic use purposes.		**Medium:** • 1.22 hectares impacted (3 parcels). • Acquisition of a small portion of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) (northeast portions). • Acquisition of 2 residential properties.	
		Medium	Modest impacts; acquisitions required							
		Excellent	No impacts; no acquisition required							
	Conforms to Secondary Plan	Poor	Does not conform to Secondary Plan	**Good:** • Conforms to Secondary Plan for north-south alignment only	**Poor:** • Does not conform to Secondary Plan.				**Excellent:** • Conforms to Secondary Plan.	
		Good	Partially conforms to Secondary Plan							
		Excellent	Conformance to Secondary Plan							
	Ease of Implementation	Poor	Significant challenges, which cannot be mitigated	**Medium:** • One residential property required, which may result in land acquisition.	**Poor:** • As a result of the City of Hamilton's recent purchase of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) for civic purposes and in recognition of its intent to maintain the land for those uses, the ability to construct this alternative is unlikely.				**Medium:** • A minimum of two residential properties required, which may result in land acquisition. Acquisition of a small portion of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) also required.	
		Medium	Significant challenges, but can be mitigated							
		Good	Poses few challenges to implementation, but can be mitigated							
		Excellent	Poses no challenges to implementation							
	Estimated Capital Costs	Poor	High Cost	**Medium:** • Infrastructure costs: $4.6 - $5.0 million; plus, the potential cost associated with acquiring one residential property.	**Medium:** • Infrastructure costs: $4.5 - $4.9 million; plus, the potential cost associated with acquiring one residential property and partial acquisition of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities).		**Poor:** • Infrastructure costs: $5.3 - $5.7 million; plus, the potential cost associated with acquiring the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities).		**Medium** • Infrastructure costs: $4.6 - $5.0 million; plus, the potential cost associated with acquiring two residential property and acquisition of a small portion of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities).	
		Medium	Medium Cost							
		Good	Low Cost							

Table 5.3. Evaluation of Alignment Alternatives

Category and Criteria		Indicators		Route 1a	Route 2a	Route 2b	Route 3a	Route 3b	Route 4a	Route 4b
Sustainability	**Pedestrians-Safety, walking environment, encourages walking**	Poor	No pedestrian facilities provided	**Good:** • Will comprise a multi-use path on the east side and a wide sidewalk located on the west side. • The average pedestrian crossing distance is 24.5 m.	**Good:** • Will comprise a multi-use path on the east side and a wide sidewalk located on the west side. • The average pedestrian crossing distance is 22.9 m.	**Good:** • Will comprise a multi-use path on the east side and a wide sidewalk located on the west side. • The average pedestrian crossing distance is 23 m.	**Good:** • Will comprise a multi-use path on the east side and a wide sidewalk located on the west side. • The average pedestrian crossing distance is 22.9 m.		**Good:** • Will comprise a multi-use path on both sides. • The average pedestrian crossing distance is 23.2 m.	**Good:** • Will comprise a multi-use path on both sides. • The average pedestrian crossing distance is 22.9 m.
		Neutral	Sufficient sidewalk widths with adequate distance between roadway and sidewalk							
		Good	Sufficient sidewalk widths with large distance between roadway and sidewalk							
		Excellent	Wide sidewalk widths with large distance between roadway and sidewalk							
	Cycling Infrastructure	Poor	No cycling facilities	**Good:** • New road may consist of a proposed on-street cycle lanes with a buffer in the interim.						
		Neutral	On-street cycle lanes							
		Good	Separated on street cycle lanes (added buffer) or multi-use path added to boulevard							
		Excellent	Cycle Track provided							
	Transit Supportive Development	Poor	Decrease in ridership potential	**Good:** • Gordon Dean will accommodate HSR service for local residents and community facilities. • Road rights-of-way will accommodate future Hamilton BRT.						
		Neutral	No anticipated change in ridership potential							
		Good	Provides for improved transit services							
		Excellent	Transit only lanes, significant increase in ridership potential							
	Incorporates innovative products / practices	Poor	Uses out of date products / practices	**Good:** • 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.						
		Neutral	Uses standard products / practices							
		Good	Incorporates one innovative product or practice							
		Excellent	Incorporates two or more innovative products or practices							

Table 5.3. Evaluation of Alignment Alternatives

Category and Criteria		Indicators		Route 1a	Route 2a	Route 2b	Route 3a	Route 3b	Route 4a	Route 4b
Operations and Safety	Truck Operations (2 lanes)	Poor	No curb	**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.			**Neutral:** • The largest curb radius needed to accommodate truck traffic is 30 m at the northeast quadrant of the Gordon Dean and Barton intersection.	**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.		**Neutral:** • The largest curb radius needed to accommodate truck traffic is 30 m at the northeast quadrant of the Gordon Dean and Barton intersection.
		Neutral	Curb radii 10+m larger than standard							
		Good	Curb radii 5-10m larger than standard							
		Excellent	Standard curb radii							
	Truck Operations (4 lanes)	Poor	No curb	**Good:** • The curb radius follows the City of Hamilton standards, but LCVs turn into the second lane.						
		Neutral	Curb radii larger than standard							
		Good	Standard curb radii, trucks take two lanes to turn							
		Excellent	Standard curb radii, truck turns into designated lane							
	Drivers - Capacity, speed, intersection operations	Poor	Significant delay	**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.						
		Neutral	Some delay							
		Good	Acceptable delay, sufficient capacity							
		Excellent	Significant reduction in congestion							
	Sight Distance Checks	Poor	Major obstruction	**Good:** • Some trees obstructing the right turn view on Barton St.						
		Neutral	Minor obstruction that cannot be easily removed							
		Good	Minor obstruction that can be easily removed							
		Excellent	No obstruction							
	Overall Safety	Poor	Severe residual safety risks	**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. Combing 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.						
		Neutral	Meets minimum requirements with some residual risk							
		Good	Low risk							
		Excellent	No risk							

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 5.7. Preliminary design plans of the preferred option are provided in **Appendix J**.

Characteristics of each roadway are as follows:

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 36.0 m Right-of-Way. A five-lane cross section: two northbound and two southbound lanes separated by painted median and an exclusive left turn lane at the intersections will be provided. Additionally, a 3.0m multi-use path on the east side, and a 1.5m sidewalk on the west side of the corridor is planned, separated by the concrete curb and gutter and boulevard. For aesthetic and landscaping purpose, the median space can be also be utilized as a planter and could be considered during detailed design.

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. Provision of a 3.0 m multi-use path along the north side to be determined during detailed design.

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 6.1. Design Criteria for Gordon Dean Avenue

Classification	Design Standards[1]	Proposed
General		
Road Classification	UAU 60 (Minor Arterial)	UAU 60 (Minor Arterial)
Posted Speed (km/h)	50	50
Design Speed (km/h)	60	60
Usage	Truck Route	Truck Route

[1] Geometric Design Guide for Canadian Road – 2017 (Transportation Association of Canada)

Table 6.1. Design Criteria for Gordon Dean Avenue			
Classification		**Design Standards[1]**	**Proposed**
Design Vehicle		WB20.5	WB20.5
Horizontal Alignment			
Normal Crown (-0.02 m/m) R_{min} (m)		1290 m	5000 m
Reverse Crown (+0.02 m/m) R_{min} (m)		160 m	5000 m
Cross Section Elements			
Lane Widths (m)	Through Lane Width	3.5 - 3.75	3.5
	Left Turn Lane Width	3.5	3.5
	Right Turn Lane Width	3.5	3.5
	Curb Lane Width	3.5 - 3.75	3.5
	Bus Bay Width	-	3.75
Tangent Section Cross Fall (%)		2.0	2.0
Multi-Use Pathway Width (m)		3.0 (min)	3.0
Multi-Use Path Cross Fall (%)		2.0	2.0
Sidewalk Width (m)		1.5 (min)	1.5
Multi-Use Path Cross Fall (%)		2.0	2.0
Vertical Alignment			
Maximum Grade		6%	2.01%
Minimum Grade		0.75%	0.75%
Sag Vertical Curve K_{min} - (Comfort Control)		8-9	-
Crest Vertical Curve K_{min}		12	30
Layout			
Radius of Curbs at Intersections		-	-
Right-of-Way (ROW) Width (m)		-	36.0

Table 6.2. Design Criteria for Collector Road 'B'		
Classification	**Design Standards[2]**	**Proposed**
General		
Road Classification	UCU 60 (Minor Collector)	UCU 60 (Minor Arterial)

[2] Geometric Design Guide for Canadian Road – 2017 (Transportation Association of Canada)

Table 6.2. Design Criteria for Collector Road 'B'			
Classification		**Design Standards[2]**	**Proposed**
Posted Speed (km/h)		50	50
Design Speed (km/h)		50	60
Usage		Passenger	Passenger
Design Vehicle		Light Truck	Light Truck
Horizontal Alignment			
Normal Crown (-0.02 m/m) R_{min} (m)		1290 m	400 m
Reverse Crown (+0.02 m/m) R_{min} (m)		185 m	400 m
Cross Section Elements			
Lane Widths (m)	Through Lane Width	3.5 - 3.75	4.0
	Left Turn Lane Width	3.5	4.0
	Right Turn Lane Width	3.5	4.0
	Curb Lane Width	3.5 - 3.75	4.0
Flush Median Width (m)		1.5	1.5
Sidewalk Width (m)		1.5 (min)	2.0
Tangent Section Cross Fall (%)		2.0	2.0
Sidewalk Cross Fall (%)		2.0	2.0
Vertical Alignment			
Maximum Grade		6%	2.35%
Minimum Grade		0.75%	0.75%
Sag Vertical Curve K_{min} - (Comfort Control)		8-9	12
Crest Vertical Curve K_{min}		11	12
Layout			
Radius of Curbs at Intersections		8.0	10.0
Right-of-Way (ROW) Width (m)		-	26.0

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 6.1 and 6.2.

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

Corridor / Features	Gordon Dean Ave. (Ultimate)	Collector Road 'B'
ROW	36 m	26 m
Travel Lanes	3.5 m (4)	4.0 m (2)
Painted flushed median/Planter	3.5 m (1)	-
Curb and Gutter	0.5 m (2)	0.5 m (2)
Boulevard	2.0 m (2)	3.0 m (2)
Multi-Use Path	3.0 m (1 on east side)	-
Sidewalk	1.5 m (1 on west side)	2.0 m (2)
Offset	4.0 m (2)	3.5 m (2)

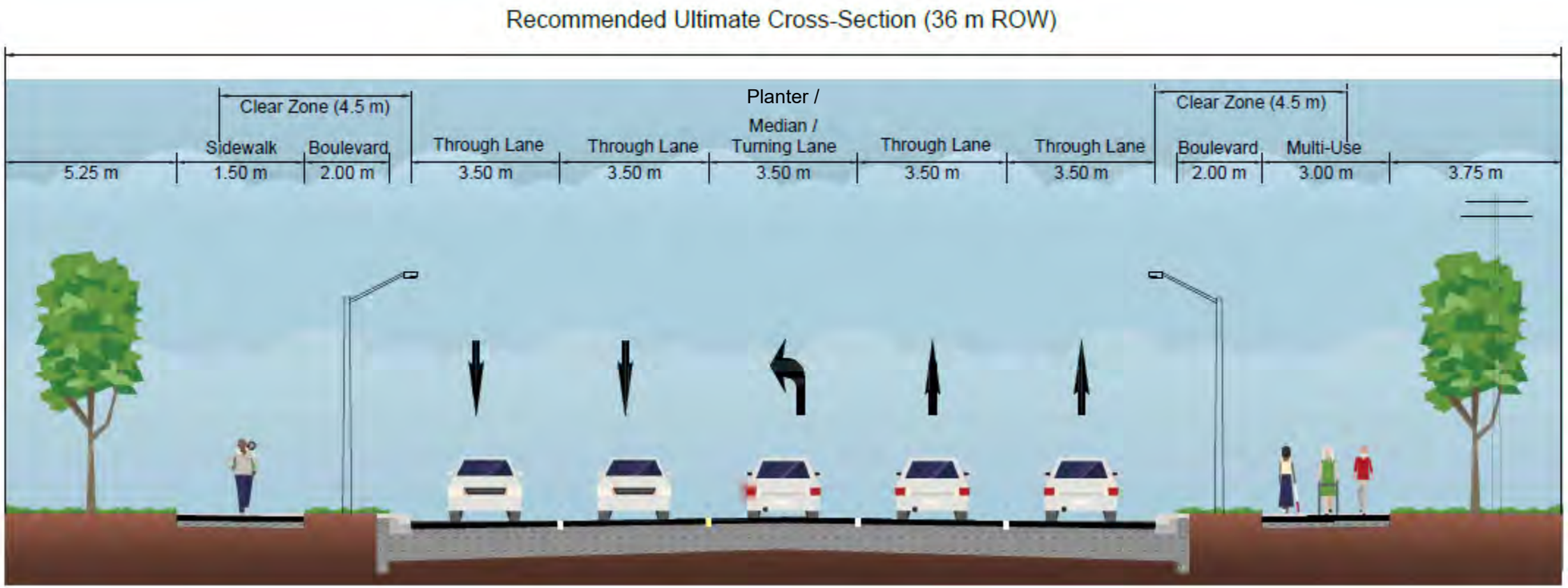


Figure 6.1. Recommended Cross Section for Gordon Dean Avenue (Ultimate 36.0 m ROW)

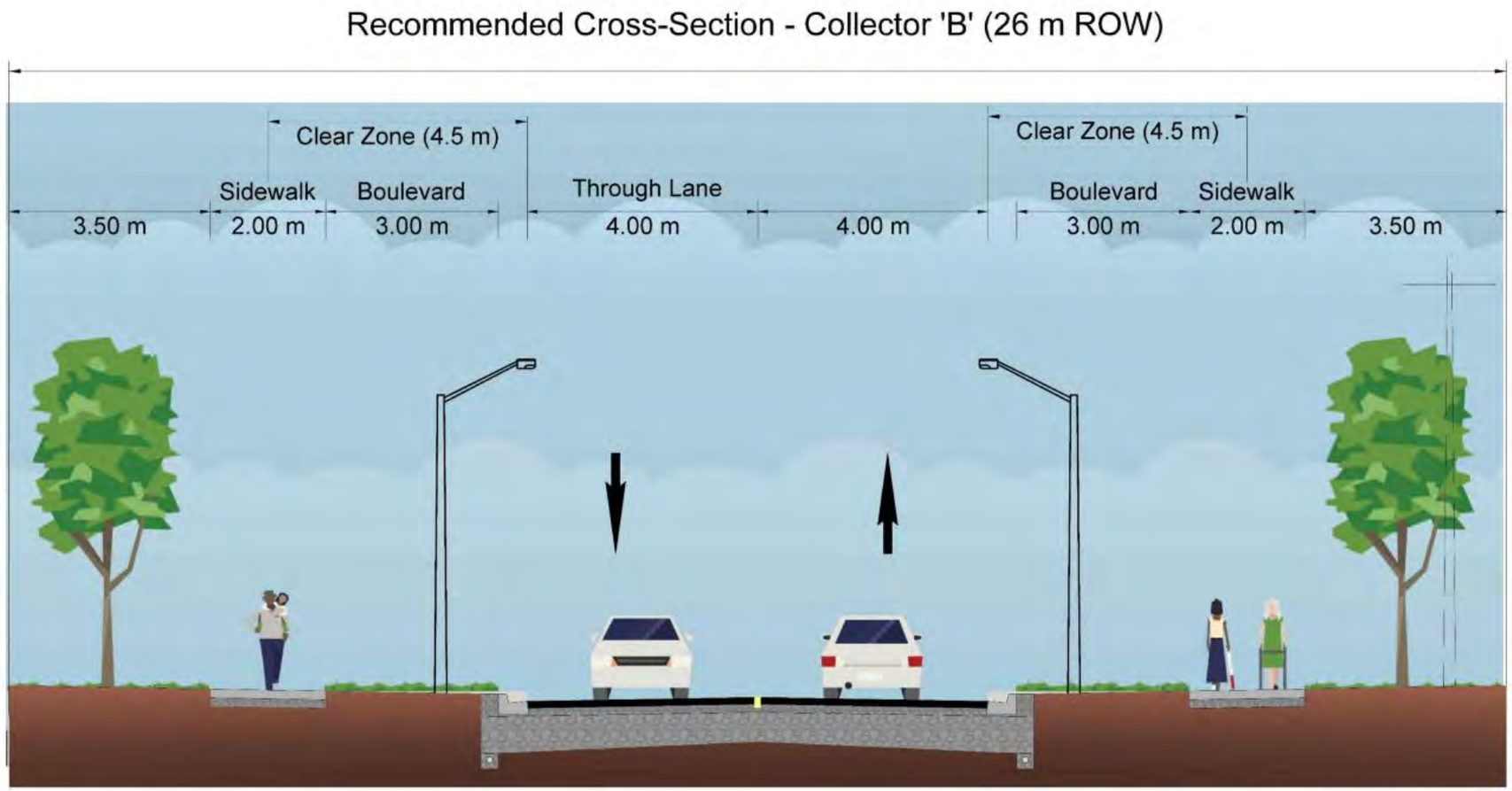


Figure 6.2. Recommended Cross Section for Collector Road ‘B’ (26.0 m ROW)

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 J**.

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

Table 6.4. Proposed Intersections for Gordon Dean Avenue and Collector Road 'B' – Ultimate Configurations

Proposed Intersection	North Approach	South Approach	East Approach	West Approach
Gordon Dean Avenue at Highway 8 (3-legged, Signalized)	1-South Bound Right 1-South Bound Left	-	1-West Bound Through Right 1-West Bound Through	1-East Bound Left 2-East Bound Through
Gordon Dean Avenue at Collector Road 'B' (4-legged, Signalized)	1-South Bound Through Right 1-South Bound Through 1-South Bound Left	1-North Bound Through Right 1-North Bound Through 1-North Bound Left	1-West Bound Through Right 1-West Bound Left	1-East Bound Through Right 1-East Bound Left
Gordon Dean Avenue at Barton Street (4-legged, Signalized)	1-South Bound Through Right 1-South Bound Left	1-North Bound Through Right 1-North Bound Left	1-West Bound Through Right 1-West Bound Through 1-West Bound Left	1-East Bound Through Right 1-East Bound Through 1-East Bound Left
Collector Road 'B' at Fruitland Road (4-legged, Stop Control)	1-South Bound Through Right 1-South Bound Left	1-North Bound Through Right 1-North Bound Left	1-West Bound Left Through Right	1-East Bound Left Through Right

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.

The culvert structure has also been proposed at a location and configuration such that it can accommodate and not compromise the future WC-5.0 realignment planned under future land development. 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 inlet and outlet channels to provide an effective and functional connection through the proposed culvert.

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 and approval of the Block 1 BSS, 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 6.3, and the proposed location of the culvert is identified on the preliminary conceptual design plans in **Appendix J**. 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 (i.e., sediment releases) or harm to fish.

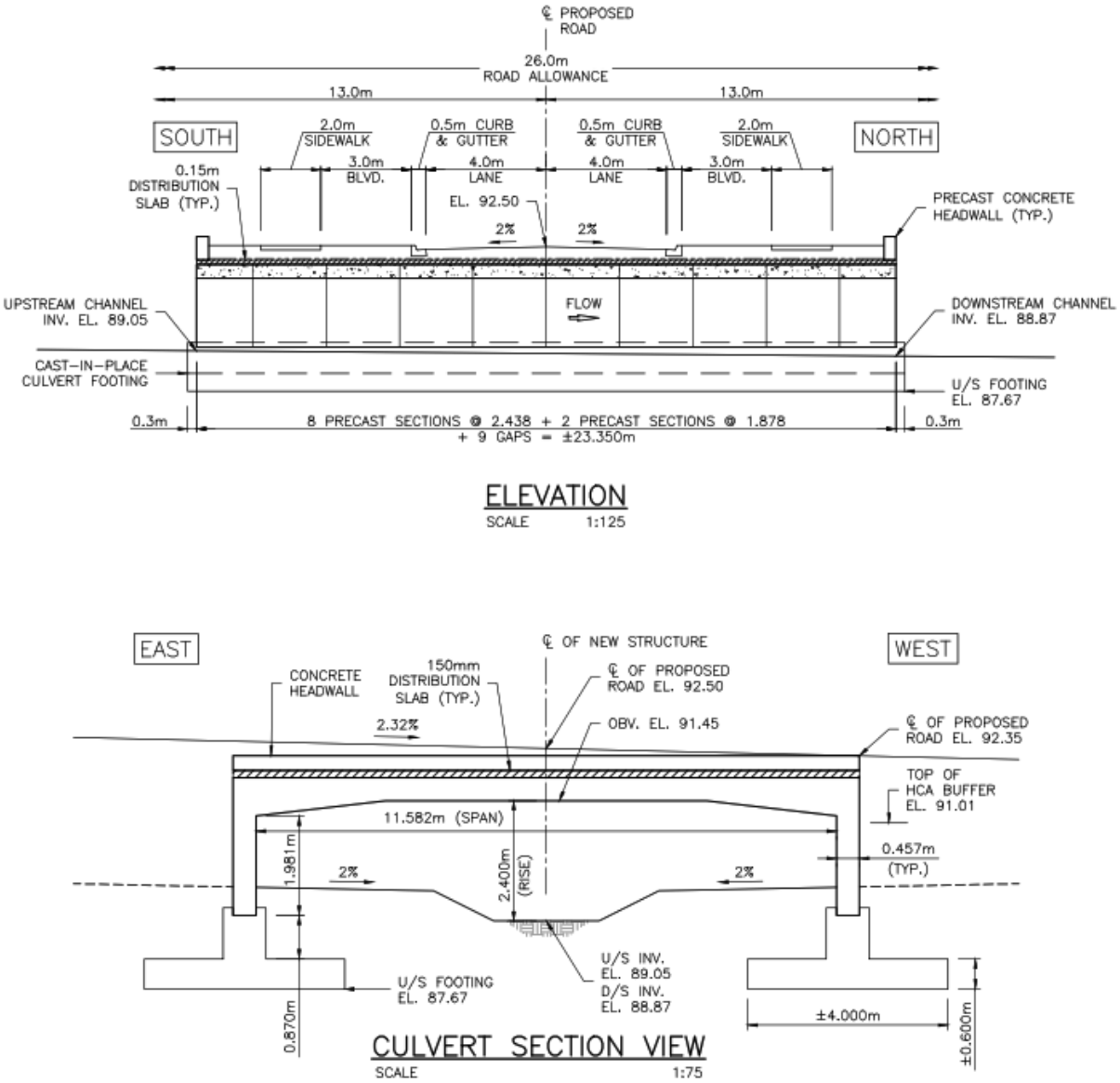


Figure 6.3. Preliminary Cross Section of the Proposed Span Culvert at WC 5.0

6.1.6 Active Transportation

Gordon Dean Avenue will have a multi-use path on the east side and a sidewalk on the west side of the road. The average pedestrian crossing distance will be 23.0 m. Collector Road 'B' is identified to have a sidewalk, however provision of a 3.0 m multi-use path along the north side to be determined during detailed design.

6.1.7 Urban Design

Urban design is the practice of shaping the physical form of urban areas and plays a vital role in upgrading and maintaining a City's civic image, economic potential, and quality of life. Urban design guidelines are used by the City of Hamilton to bridge the broad urban design policies of the City's Official Plan and the associated secondary planning areas into specific guidance unique to a place. The Fruitland-Winona Urban Design Principles and Guidelines for Special Character Areas (City of Hamilton, 2013a) is a document that provides guidance and demonstration of the urban design principles and design characteristics of specific areas within the Fruitland-Winona Secondary Plan area. These areas are called Special Character Areas. They have been chosen either due to their strategic value within the community, or due to uniqueness or specialty that requires a demonstration of the vision for these areas. The Special Character Areas identified within the Fruitland-Winona Secondary Plan area are as below (City of Hamilton, 2013a):

- Gateways;
- Community Campus Node;
- Winona Local Commercial Main Street;
- Barton Street Pedestrian Promenade;
- Barton Street Built Form;
- Jones Road Neighbourhood Trail; and,
- Highway No. 8 Character Road.

A review of the Fruitland-Winona Urban Design Principles and Guidelines for Special Character Areas indicates that the intersection of the proposed Gordon Dean Avenue and Barton Street is classified as a Minor Gateway. Minor Gateways are intended to mark the entry into a neighbourhood and shall consist of spaces that comprise minor landscaping elements and features.

6.1.8 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.

6.1.9 Property Requirements

Gordon Dean Avenue

Two residential properties and a portion of the City of Hamilton property for the Public Works Facility (lands formerly owned by Alectra Utilities) will be required to allow construction 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 during detailed design. Any land acquisitions required to implement this project will require consultation with the landowner(s) to determine and negotiate compensation requirements.

Collector Road 'B'

Potential minor impacts are anticipated on two properties along Fruitland Road. These impacts shall be addressed during detailed design via design refinements and/or in consultation with property owners to discuss and negotiate compensation for property impacts.

6.1.10 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.

6.1.11 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. Placement of lights shall be considered in detailed design as per City of Hamilton's Comprehensive Development Guidelines and Financial Policies Manual (M.18. Appendix R – Sidewalk and Roadway Lighting Guideline). A pdf of these development guidelines can be downloaded from this link: https://www.hamilton.ca/develop-property/policies-guidelines/comprehensive-development-guidelines-and-financial-policies.

6.1.12 Construction Implementation

The responsibility for this Study is that of Fruitland – Winona Development Group, however, Gordon Dean Avenue and Collector Road 'B' from Fruitland Road to and including the intersection of Gordon Dean Avenue may be designed and constructed by various proponents.

6.1.13 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.

6.1.14 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[3]				
Item	**Unit**	**Unit Cost**	**Quantity**	**Cost**
Removal				
Clearing	Lump Sum	$20,000	1	$20,000
New Road Construction				
Top Asphalt (Superpave 9.5)	Tonne	$130	1996	$259,480
Base Asphalt (Superpave 19.0)	Tonne	$120	5201	$624,120
Granular A (150mm)	Tonne	$25	7802	$195,050
Granular B (300mm)	Tonne	$30	15604	$468,120
Concrete Curb	Metre	$70	2200	$154,000
Catchbasin	Each	$3,000	24	$72,000
Double Catchbasin	Each	$4,000	4	$16,000
Storm Manhole	Each	$8,000	8	$64,000
Storm Sewer	Metre	$400	800	$320,000
Others				
Pavement Marking	Linear Metre	$5	4400	$22,000
Streetlight	Each	$1,500	24	$36,000
Traffic Signs	Lump Sum	$50,000	1	$50,000
Traffic Signal (3-Legged)	Each	$150,000	1	$150,000
Traffic Signal (4-Legged)	Each	$200,000	2	$400,000
			Sub-Total	**$2,850,770**
Contingency / Minor items	Lump Sum	20%	1	$570,154
Utility Relocation	Lump Sum	$20,000	100%	$20,000
			Total (Excluding HST)	**$3,440,924**

[3] The cost estimate is exclusive of property costs.

Table 6.6. Preliminary Cost Estimate for Collector Road 'B'[4]				
Item	**Unit**	**Unit Cost**	**Quantity**	**Cost**
Removal				
Clearing	Lump Sum	$20,000	1	$20,000
New Road Construction				
Top Asphalt (Superpave 9.5)	Tonne	$130	434	$56,420
Base Asphalt (Superpave 19.0)	Tonne	$120	1132	$135,840
Granular A (150 mm)	Tonne	$25	1698	$42,450
Granular B (300 mm)	Tonne	$30	3396	$101,880
Concrete Curb	Metre	$70	1200	$84,000
Catchbasin	Each	$3,000	6	$18,000
Double Catchbasin	Each	$4,000	6	$24,000
Storm Manhole	Each	$8,000	5	$40,0000
Storm Sewer	Metre	$300	400	$120,000
Span Culvert	Each	$1,350,000	1	$1,350,000
Others				
Pavement Marking	Linear Metre	$5	600	$3,000
Streetlight	Each	$1,500	12	$18,000
Traffic Signs	Lump Sum	$50,000	1	$15,000
			Sub-Total	**$2,028,590**
Contingency / Minor items	Lump Sum	20%	1	$405,718
Utility Relocation	Lump Sum	$20,000	100%	$20,000
			Total (Excluding HST)	**$2,454,308**

[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 (when the BSS is approved).

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 6.1.9, property acquisition will be required, and minor property impacts will need to be addressed during detailed design. Property acquisition will be required for Municipal addresses #703, 715 and 717 Highway. In addition, potential minor property impacts are anticipated on a residential property along Highway 8.

Property acquisition as well as minor property impacts will need to be addressed during detailed design. Any land acquisitions required to implement this project will involve consultation with the landowner(s) to determine and negotiate compensation requirements.

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. It is noted that the road construction and channel realignment may not occur at the same time. Hence there could be a lag time between the removal and providing some off-setting vegetation-based habitat function for urban wildlife in the area. As such, the timing for planting the removed vegetation in the realigned channel should be confirmed during the detailed design phase of this project, once both the road design and BSS1 schedules have been advanced. If there is a notable lag time, then the detailed design should consider landscaping elements within the Gordon Dean corridor to address the lag time period. In the interim period, some fallow agricultural areas adjacent to Gordon Dean may provide some habitat opportunities for displaced wildlife. It is anticipated that the open country bird species will relocate to more contiguous habitat remaining in rural areas of the region more removed from the advancing urban environment through planned land use change.

Table 7.1. Impacted Area of Vegetation Communities and Open Country Habitat

ELC Code	Description	Total Area (ha)	Impact Area (ha)	Percent Impacted (%)
CVR_3	Single Family Residential	10.19	0.63	6.18
CVR_4	Rural Property	6.36	1.19	18.71
FODM9-6	Fresh Moist Oak-Hardwood Deciduous Forest	0.67	0.11	16.42
H	Hedgerow	2.02	0.66	32.67

Table 7.1. Impacted Area of Vegetation Communities and Open Country Habitat				
MAM2-2	Reed-canary Grass Mineral Meadow Marsh	0.16	0.05	31.25
MAS2-1	Cattail Mineral Shallow Marsh	0.02	0.02	100
MASM1-1	Cattail Mineral Shallow Marsh	0.01	0.01	100
MEMM4	Fresh - Moist Mixed Meadow Ecosite	15.96	2.3	14.41
OAGM1	Annual Row Crops	2.05	0.08	3.9
OAO	Open Aquatic	0.01	0.01	100
	Total	**37.45 ha**	**5.06 ha**	**13.51%**

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 (i.e., migratory bird nesting protection period: restrict clearing activities to between September 1 and March 30 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.

Although the WC-5.0 watercourse and associated valley is very fragmented by urban development along its course, detailed design of the Collector Road 'B' crossing will accommodate the 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 the primary watercourse within the Study Area, characteristically exhibiting low to non-discernable flow during dry periods. Accordingly, such limiting conditions appear to have contributed to no fish having been observed or collected during fish community surveys, leading to the conclusion that WC-5.0 provides indirect fish habitat. Potential fish barriers (at least confirmed to be in effect for part of the year) were observed downstream of the Study Area, and would likely be collectively impassable due to a combination of 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 Area and Lake Ontario by major culverts. The mitigation measures committed herein are directed at maintaining and enhancing the ecological function of WC-5.0, including consideration of the function as indirect fish habitat.

The design for the Collector Road 'B' crossing of WC-5.0 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. The new channel will be a natural channel constructed using natural channel design principals. 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 4.4.1**, the Stage 1 Archaeological Assessment determined that the study area has general archaeological potential and warrants Stage 2 Archaeological Assessment on those areas (Wood, 2020a). The areas of archaeological potential are illustrated in **Figure 4.5**. A Stage 2 Archaeological Assessment shall be completed during detailed design for the areas of archaeological potential that will be impacted by project activities. The Stage 1 archaeological assessment made following recommendations:

1. There are permanently low and wet and previously disturbed lands within the Study Area. These areas are evaluated as having low to no archaeological potential and do not require further archaeological assessment.
2. There is an actively cultivated agricultural field with archaeological potential within the Study Area. Therefore, it should be subject to Stage 2 property survey by means of pedestrian survey, as per Section 2.1.1 Standard 1 of the Standards and Guidelines for Consultant Archaeologists (2011). This technique involves walking across the entire field in parallel rows at 5 m intervals and surveying the ground surface for artifacts. The agricultural land should be prepared for the pedestrian survey by ploughing to the depth of previous ploughing. The fields must be allowed to weather through one heavy rainfall to improve surface visibility. At least 80% of the ploughed ground surface must be visible after ploughing.
3. There are brush and tree covered lands, and manicured lawns within the Study Area that have archaeological potential but cannot be accessed by plough. As per Section 2.1.2 Standard 1c and Standard 1e, these portions of the Study Area should be subject to Stage 2 property survey by means of test pit survey. This technique involves hand excavating test pits at 5 m intervals. All test pits should be a minimum of 30 cm in diameter and dug to a minimum of five cm into the subsoil. Soil fills should be screened through six mm mesh screens in order to facilitate artifact recovery. Test pit profiles should be examined for cultural deposits prior to being backfilled. Test pitting should be conducted to within 1 m

of all disturbances. All test pits should be backfilled to level grade, and any sod caps replaced and tamped down by foot.

4. Additionally, the Stage 1 archaeological assessment, through background research including communication with the Bereavement Authority of Ontario and the City of Hamilton and a review of a 1969 survey map, confirmed the western limits of Mountview Gardens Cemetery (opened c. 1976) were well-defined, dated to the 20th century, and that no burials were likely to be encountered outside the cemetery boundaries. As such, a Stage 3 cemetery assessment is not required for any portion of the Project's anticipated construction which impacts the areas of archaeological potential directly adjacent to Mountview Gardens Cemetery.

7.3.2 Built Heritage Resources and Cultural Heritage Landscapes

As noted in Section 4.4.2, the Cultural Heritage memo and Checklist determined that the Study Area contains, and is adjacent to, following properties with potential cultural heritage value due to the presence of buildings or structures 40 years or older (Wood, 2020b). These properties include:

- 708 Barton Street (demolished)
- 693 Highway No. 8 (BHR1)
- 725 Highway No. 8 (BHR2)
- 735 Highway No. 8 - Mountview Gardens Cemetery (CHL1)

Location of these properties is shown on **Figure 4.5**.

The Cultural Heritage memo made following recommendations:

1. Avoidance of potential built heritage resources and cultural heritage landscapes is recommended from a cultural heritage perspective. The proposed work should be planned in a manner that avoids direct and indirect impact impacts to identified built heritage resources and cultural heritage landscapes. Further, the locations of BHR 1 (693 Highway No. 8), BHR 2 (725 Highway No. 8), and CHL 1 (735 Highway No. 8, Mountview Gardens Cemetery) should be indicated on construction mapping so that project personnel are aware of the presence of these potential built heritage resources and cultural heritage landscapes.
2. Work is planned within the southwest corner of BHR 2 (725 Highway No. 8) and in close proximity to a one-storey residence on the property. A Heritage Impact Assessment should be completed at the outset of the detailed design phase of the Project to determine whether this property has CHVI under O. Reg. 9/06 of the Ontario Heritage Act. If the property is found to have CHVI, then an impact assessment should be completed to evaluate the impacts of the proposed work and recommend appropriate mitigation measures.
3. The completion of the MHSTCI Checklist determined that there are six (6) registered archaeological sites within 250 m of the study area and one cemetery located adjacent to the study area (CHL 1, 735 Highway No. 8, Mountview

Gardens Cemetery). The recommendations contained in Wood's Stage 1 Archaeological Assessment for the Gordon Dean MCEA (2020) should be followed to address potential archaeological concerns related to this project.

7.4 Drainage

The SCUBE East Subwatershed Study Aquafor Beech Limited (Aquafor Beech Limited , 2013) overall Stormwater Management Strategy for SCUBE area. It noted that the LID techniques should be selected and designed to infiltrate target volumes ranging from 1.5 mm to 3 mm over the total catchment area. As noted in Section 4.5, the ongoing BSS for the Block 1 Area will propose stormwater management facilities for the future development within Block 1, that provides improved stormwater quality and quantity handling, including implementation of some LID techniques. As such, the stormwater management recommendations from the Block 1 BSS along with appropriate LID techniques shall be incorporated during the detailed design phase of Gordon Dean Avenue and Collector Road 'B' when the BSS for Block 1 Area is approved.

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 4.6, 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.

Conclusions from the Air Drainage Analysis from ongoing BSS for Block 1 shall be considered during detailed design of this project when the BSS for Block 1 is approved.

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 suggests 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

Climate Hazard and/or Weathering Process Likely Affected by a Changing Climate	Potential Infrastructure Impacts
Greater frequency of freeze-thaw cycles in winter months	• Soil instability, ground movement and slope instability • Triggered instability of embankments and pavement structures (ditches, culverts, drains, street hardware, bridges, tunnels) • Increased frequency, duration and severity of: thermal cracking, rutting, frost heave and thaw weakening
Hotter, drier summers	• Pavement softening • Reduction in the maximum loads that can be safely transported • Asphalt-covered surfaces are more susceptible to damage during heat waves • Increased challenges in pavement construction process

Climate Hazard and/or Weathering Process Likely Affected by a Changing Climate	Potential Infrastructure Impacts
	• Shortened life expectancy • Drier conditions affecting the life cycle of bridges and culverts • Augmentation of Urban Heat Island Effect
Milder winters	• Longer construction season, fewer pothole repairs • Less frost damage for southern roads • Decreased damage from fewer freeze-thaw cycles • Changes to maintenance schedules

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 K**.

7.9 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 7.3. Potential Impacts and Proposed Mitigation Measures

Category	Potential Impacts	Mitigation Measures
Property Requirements	• Property acquisition and additional minor property impacts to allow construction of the southern section of the Gordon Dean Avenue. • Minor property impacts along Fruitland Road to allow construction of Collector Road 'B'.	• Property acquisition shall be addressed during detailed design. Any land acquisitions required to implement this project will involve consultation with the landowner(s) to determine and negotiate compensation requirements.
Terrestrial Resources	• Removal of vegetation and existing disturbed riparian cover at the WC-5.0. • Removal of specific wildlife habitats (i.e., seasonal foraging, nesting and migratory habitat). • Permanent loss of some types of habitat (i.e., open country bird habitat) which cannot be replicated within future NHS. • Reduction in local native species abundance and diversity, including locally rare and potentially uncommon Hawthorn (*Crataegus pruinosa*). • Local micro-climate alteration. • Soil erosion resulting in potential for siltation to WC-5.0. • Alteration of local hydrologic functioning.	• 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 (i.e., hedgerows and woodlot fragments) to be impacted). • 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. • Plan tree and vegetation clearing and grubbing operations (including meadow areas) to avoid seasonal timing constraint windows for wildlife (i.e., 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: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds.html. • 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.Maintain all grading outside defined Tree Protection Zones and within erosion control fencing. • Identify native plant materials to be potentially salvaged for use in habitat enhancement works, or to be transplanted, including locally significant species (i.e., *Crataegus* pruinosa, *Cornus* spp, *Salix* spp, *Rosa carolina*) and quality groundcovers such as *Comandra umbellate, Potentilla simplex* and other quality species. Identify areas for storage or 'healing-in'. • 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. • Provide contract requirements for removal of sediment control fences within 12 months after completion of construction. • Plan storage and disposal of construction waste and debris. • Control access, storage and movement of supplies and equipment away from protected areas. • Control use of hazardous substances/ chemicals/ materials on construction site by providing contractors with written notification of expectations regarding use and disposal of such items. • Prepare and implement stormwater plan to maintain surface catchment characteristics supporting Watercourse 5.0. • 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. • Reinstate vegetative cover in compliance with HCA and City requirements. • Culvert design to address small to medium sized wildlife passage (i.e., terrestrial benches, curb walls. directional plantings, drift fencing). This will promote wildlife use of corridor and result in a reduction in future road kills. • Design and construct underground services to minimize impacts to groundwater flows. • Plan low impact lighting of roads in conformity with City standards.

Table 7.3. Potential Impacts and Proposed Mitigation Measures

Category	Potential Impacts	Mitigation Measures
Aquatic Resources	• Introduction of sediments, concrete and other deleterious substances into WC-5.0 • Alteration of flows due to installation of in-water structure • Disruption of critical fish life stages • Erosion and sedimentation due to the operation of machinery • Loss of vegetative cover within the riparian zone and over the watercourse, therefore potentially impacting existing thermal regime	**General** • Study activities shall be scheduled to avoid wet and rainy periods and in-water works shall be conducted during low flow condition. • 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. • 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). • Temporarily store, handle and dispose of all materials used or generated (i.e., 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. **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 (i.e., 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).

Table 7.3. Potential Impacts and Proposed Mitigation Measures

Category	Potential Impacts	Mitigation Measures
		• Surround stockpiles with appropriate perimeter ESC measures (i.e., silt fence and biologs) or cover with secured geotextiles/membranes. • Install storm water detention device to intercept storm water, settle suspended solids, and release bylaw compliant storm water at a controlled rate. • 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. **Shoreline / Bank / Vegetation / Stabilization** • The disturbance or removal of riparian vegetation should be minimized. • 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. • 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. • In the event that riverstone erosion protection / armouring 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. • Substrates selected for the WC-5.0 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. **Operation of Machinery** • 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. • Construction staging shall occur in a manner to prevent spills and / or leaks into the creek. • Implement drip pans under equipment (i.e., generators, pumps, etc.) in operation within the work areas. • 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.
Archaeological Resources	• Impacts to potential archaeological resources.	• 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 send 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. • In addition to above, based on engagement with MCFN Field Liaison Representatives shall be involved in Stage 2 Archaeological Assessment (and any additional archaeological fieldwork) during detailed design phase of this project. • No grading or other construction activities that may result in the destruction or disturbance to the Study Area is permitted until notice of the approval has been received from the MHSTCI. • Archaeological Risk Management specifications will be applied to provide direction for the incidental encounter with archaeological features and human remains. • Communication with the Bereavement Authority of Ontario and the City of Hamilton and a review of a 1969 survey map, confirmed the western limits of Mountview Gardens Cemetery (opened c. 1976) were well-defined, dated to the 20th century, and that no burials were likely to be encountered outside the cemetery boundaries. As such, a Stage 3 cemetery assessment is not required for any portion of the Project's anticipated construction which impacts the areas of archaeological potential directly adjacent to Mountview Gardens Cemetery.
Built Heritage Resources and	• Impacts to potential built heritage resources	• Avoidance of potential built heritage resources and cultural heritage landscapes is recommended from a cultural heritage perspective. The proposed work should be planned in a manner that avoids direct and indirect impact impacts to identified built heritage resources and cultural

Table 7.3. Potential Impacts and Proposed Mitigation Measures

Category	Potential Impacts	Mitigation Measures
Cultural Heritage Landscapes		heritage landscapes. Further, the locations of BHR 1 (693 Highway No. 8), BHR 2 (725 Highway No. 8), and CHL 1 (735 Highway No. 8, Mountview Gardens Cemetery) should be indicated on construction mapping so that project personnel are aware of the presence of these potential built heritage resources and cultural heritage landscapes. • Work is planned within the southwest corner of BHR 2 (725 Highway No. 8) and in close proximity to a one-storey residence on the property. A Heritage Impact Assessment should be completed at the outset of the detailed design phase of the Project to determine whether this property has CHVI under O. Reg. 9/06 of the Ontario Heritage Act. If the property is found to have CHVI, then an impact assessment should be completed to evaluate the impacts of the proposed work and recommend appropriate mitigation measures.
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 along with appropriate LID techniques shall be incorporated in the detailed design phase of this project, when BSS for Block 1 Area is approved. • Considerations should be given to infrastructure design to be resilient to the impacts of climate change.
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 (i.e., 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. • Establish communication and requirements for contractor to reduce or eliminate tailgate banging on material delivery.

8.0 Future Commitments

8.1 Detailed Design Commitments

The scope of work of this environmental assessment study has included the alignment of both Gordon Dean Avenue and the western portion of the Collector Road 'B' within Block 1 of the Fruitland-Winona Secondary Plan area. It is important to note, however, that construction of both roadways can be carried out independently of each other, by either Fruitland-Winona Development Group, the City of Hamilton or other development proponents.

Additional detailed design commitments will be required to fulfill the obligations as defined and outlined in this EA. Some detailed design commitments for each roadway are common to both roadways, while some are unique. 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 additional work effort and studies will be required, as outlined in Table 8.1.

Table 8.1. Summary of Detailed Design Commitments for Gordon Dean Avenue and West Portion of Collector Road 'B'

Category	Gordon Dean Avenue	Collector Road 'B'	Future Commitment
Property Requirements	☒	☒	• Obtain legal surveys to confirm property requirements and initiate negotiations with property owners as may be required.
Natural Environment	☒	☒	• Consult with MECP regarding next steps to ensure ESA compliance for SAR (Barn Swallow, Bobolink, Eastern Meadowlark, and bat species), and any detailed design accommodation may be required for these species.
		☒	• 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 tree inventory and establish a Tree Preservation Plan as may be required using the City of Hamilton's Tree Protection Guidelines (revised October 2010). The Tree Preservation Plan shall include screening for Butternut and further assessment of Hawthorns.
	☒	☒	• Develop a Monitoring Plan in consultation with the City of Hamilton and regulatory agencies (i.e., HCA, MNRF, MECP) that addresses the performance of WC-5.0 crossing, ecological restoration area and the natural channel implementation. Details about the Monitoring Plan are provided in Section 8.3 below.
	☒	☒	• Road construction and channel realignment may not occur at the same time. Hence there could be a lag time between the removal and providing some off-setting vegetation-based habitat function for urban wildlife in the area. As such, the timing for planting the removed vegetation in the realigned channel should be confirmed during the detailed design phase of this project, once both the road design and BSS1 schedules have been advanced. If there is a notable lag time, then the detailed design should consider landscaping elements within the Gordon Dean corridor to cover the lag time period.
	☒	☒	• Undertake a vegetation restoration / landscape plan(s) for WC-5.0 crossing and Gordon Dean Avenue. The vegetation restoration/landscape plan(s) should consider native plant species that are representative of those found in the Hamilton region, and no non-native plant species should be applied in the permanent materials for the WC-5.0 ecological restoration plan. Incorporate minor landscaping elements and features in the landscaping plan for the intersection of Gordon Dean Avenue and Barton Street (Minor Gateway).
	☒	☒	• Complete a Transplant/Salvage Plan to identify native plant materials to be potentially salvaged for use in habitat enhancement works, or to be transplanted, including locally significant species (e.g. *Crataegus pruinose var. pruinisa*, *Cornus spp*, *Salix spp*, *Rosa carolina*) and quality groundcovers such as *Comandra umbellate*, *Potentilla simplex* and other quality species. Identify areas for storage or 'healing-in'. This Plan is to be submitted prior to the removal of vegetation species.
Cultural Environment	☒	☒	• Complete Stage 2 Archaeological Assessment during detailed design to confirm if any site-specific mitigation actions may be required prior to construction. Based on engagement with MCFN, Field Liaison Representatives shall be involved in Stage 2 Archaeological Assessment (and any additional archaeological fieldwork) to monitor fieldwork.
		☒	• Work is planned within the southwest corner of BHR 2 (725 Highway No. 8) and in close proximity to a one-storey residence on the property. A Heritage Impact Assessment should be completed at the outset of the detailed design phase of the Project to determine whether this property has CHVI under O. Reg. 9/06 of the Ontario Heritage Act. If the property is found to have CHVI, then an impact assessment should be completed to evaluate the impacts of the proposed work and recommend appropriate mitigation measures.
Drainage / Stormwater Management	☒	☒	• Identify the impact on drainage and stormwater features from climate change influenced rainfall, which will be determined through the yet to be approved Block 1 BSS and during detailed design.
	☒	☒	• Review and incorporate stormwater management, utilities and other servicing aspects as determined by the yet to be approved Block 1 BSS in relation to the road development. To be consistent with the approved Block 1 SS Report, but if Block 1 SS implementation is not proceeding, needs to consider its own drainage accommodation independently, while being consistent with Block 1 SS Report recommendations.

Table 8.1. Summary of Detailed Design Commitments for Gordon Dean Avenue and West Portion of Collector Road 'B'

Category	Gordon Dean Avenue	Collector Road 'B'	Future Commitment
		☒	• Complete hydrologic and hydraulic assessment of the WC-5.0 crossing and incorporate input of an ecologist to confirm final location of the span culvert and associated channel realignment details and appropriate erosion control measures.
Groundwater and Soils	☒	☒	• Review completed hydrogeological study as part of the Block 1 BSS and incorporate any findings that require accommodation in the road detailed design, when the Block 1 for BSS is approved.
	☒	☒	• 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.
	☒	☒	• Undertake geotechnical investigations and analysis.
Air Quality	☒	☒	• Incorporate conclusions from the Air Drainage Analysis from ongoing BSS for Block 1 (yet to be approved).
	☒	☒	• 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.
Noise	☒	☒	• Follow the recommendation of the noise study.
Fluvial Geomorphology		☒	• Incorporate the recommendations of the Fluvial Geomorphological and Meander Belt Width Assessment from the Block 1 BSS, when that study is approved.
Road Design	☒	☒	• 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.
	☒		• Evaluate provision of planter/landscape features in the median between intersections along Gordon Dean Avenue.
	☒		• Determine the design of the future transit facility (if required) such as lanes, stops and shelters.
	☒	☒	• Review safety requirements of Gordon Dean Avenue and Collector Road 'B' in greater detail.
Active Transportation		☒	• Assess provision of a 3.0 m multi-use path along north side of Collector Road 'B'.
Utilities	☒	☒	• Confirm utilities and relocation, as required.
Traffic	☒		• Complete traffic signal design.
Illumination	☒	☒	• 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. Placement of lights shall be considered as per City of Hamilton's Comprehensive Development Guidelines and Financial Policies Manual (M.18. Appendix R – Sidewalk and Roadway Lighting Guideline). A pdf of these development guidelines can be downloaded from this link: https://www.hamilton.ca/develop-property/policies-guidelines/comprehensive-development-guidelines-and-financial-policies
	☒	☒	• Confirm innovative practices / products that can be incorporated, such as LED streetlights and types of active transportation facility material.
Construction Implementation	☒	☒	• 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 and Collector Road 'B'.

Table 8.1. Summary of Detailed Design Commitments for Gordon Dean Avenue and West Portion of Collector Road 'B'

Category	Gordon Dean Avenue	Collector Road 'B'	Future Commitment
	☒	☒	• 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.
	☒	☒	• Complete the construction plan, with consideration given to noise and dust control, protection of natural environment, etc.
	☒	☒	• Confirm and complete relevant permitting and approval and incorporate conditions in design and specifications as may be required.

8.2 Permits and Approvals

There are a number of permits and approvals and associated processes 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:

Natural Environment:

- 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. 161/06 (HCA) and the Fish and Wildlife Conservation Act (FWCA) (MNRF).
- Obtain a License to Collect Fish for Scientific Purposes (LCFSP) from the MNRF. This shall be completed by the contractor during construction.
- Consult with MECP regarding next steps to ensure ESA compliance for SAR (Barn Swallow, Bobolink, Eastern Meadowlark, and bat species).

Cultural Environment:

- Obtain approval/authorization from the Ministry of Heritage, Sport, Tourism and Culture Industries regarding archaeological and built heritage resources (as may be required) prior to any ground disturbance activities.

Drainage:

- 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.

Groundwater:

- An Environmental Activity and Sector Registry may be required for the following:
  - Surface water takings related to specific road construction purposes
  - 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

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 (including timing) 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 March 31 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-5.0 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

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

Aquafor Beech Limited. (2013). *Stoney Creek Urban Boundary Expansion (SCUBE) West Subwatershed Study Phase 1 and Phase 2 Final Report. May 15, 2013. Prepared for the City of Hamilton.*

City of Hamilton. (2009). *City of Hamilton Criteria and Guidelines for Stormwater Infrastructure Design (PW09043/PED09130) - (City Wide). April 16, 2009.* Retrieved from http://www2.hamilton.ca/NR/rdonlyres/9B4B0C83-1A0A-4F36-A37B-19B309CFD995/0/May04PW09043.pdf

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

City of Hamilton. (2011). *City of Hamilton By-Law No. 11-285 - Noise Control By-Law. Bill No. 285. Passed on November 30, 2011.* Retrieved from https://www.hamilton.ca/government-information/by-laws-and-enforcement/city-hamilton-by-laws

City of Hamilton. (2013). *Urban Hamilton Official Plan.* Retrieved from https://www.hamilton.ca/city-planning/official-plan-zoning-by-law/urban-hamilton-official-plan

City of Hamilton. (2013a). *Fruitland-Winona Urban Design Principles and Guidelines for Special Character Areas.* Prepared By: Community Planning, Planning Division, Planning and Economic Development Department, City of Hamilton (2013). Retrieved from https://www.hamilton.ca/city-planning/planning-community/fruitland-winona-secondary-plan

City of Hamilton. (2013b). *Fruitland-Winona Secondary Plan - Summary Report. City of Hamilton - Planning and Economic Development. 2013.* Retrieved April 2020, from https://www.hamilton.ca/city-planning/planning-community/fruitland-winona-secondary-plan

City of Hamilton. (2017). *City of Hamilton Truck Route Map - Highways Designated for Use By Heavy Traffic. April 2017.* Retrieved from https://www.hamilton.ca/streets-transportation/driving-traffic/hamiltons-truck-route-network

City of Hamilton. (2018). *Hamilton City-wide Transportation Master Plan.* Retrieved from https://www.hamilton.ca/city-planning/master-plans-class-eas/city-wide-transportation-master-plan

City of Hamilton. (2019). *City of Hamilton Drinking Water Systems Annual Summary and Water Quality Report 2019 – Ontario Regulation 170/03, Section 11 & Schedule 22.* Retrieved April 2020, from https://www.hamilton.ca/home-property-and-development/water-sewer/water-quality

City of Hamilton. (2020a). *Development Applications Mapping*. Retrieved April 2020, from Hamilton.ca: https://www.hamilton.ca/develop-property/planning-applications/development-applications-mapping

City of Hamilton. (2020b). *HSR Bus Schedules & Fares - Schedule, Routes & Maps - PDF Bus Schedules - Route 55 - STONEY CREEK CENTRAL.* Retrieved from https://www.hamilton.ca/hsr-bus-schedules-fares/schedule-routes-maps/pdf-bus-schedules

COSEWIC. (2019). *COSEWIC Species Assessments (detailed version), October 2019.* Retrieved from http://cosewic.ca/index.php/en-ca/assessment-process

Cubasch et al. (2013). *Introduction. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung,.* Retrieved from https://www.ipcc.ch/report/ar5/wg1/

Dillon Consulting. (2007). *Watercourse 5 and 6 Class Environmental Assessment Study.*

Dillon Consulting Limited. (2008). *Stoney Creek Urban Boundary Expansion (SCUBE) Area – Transportation Master Plan (Phases 1 & 2) Study Report. November 2008.* Retrieved from https://www.hamilton.ca/sites/default/files/media/browser/2015-11-05%2014%3A52/scube-tmp-study-report.pdf

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

Dougan & Associates. (2020). *Environmental Impact Assessment - Gordon Dean Avenue - Schedule 'C' Municipal Class Environmental Assessment (Phases 3 & 4), City of Hamilton, Ontario. May 2020.*

Fisheries and Oceans Canada. (2020). *Aquatic species at risk map.* Retrieved from http://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Halton-Hamilton Source Protection Committee. (2017a). *Source Protection Plans for the Halton Region Source Protection Area and the Hamilton Region Source Protection Area. (Version 3.3) October 2017.* Retrieved April 2020, from http://protectingwater.ca/docandmaps.cfm?smocid=1372

Halton-Hamilton Source Protection Committee. (2017b). *Assessment Report for the Hamilton Region Source Protection Area. (Version 3.1) October 2017.* Retrieved April 2020, from http://protectingwater.ca/docandmaps.cfm?smocid=1424

International Institute for Sustainable Development. (2013). *Climate Change Adaptation and Canadian Infrastructure - A review of the literature, Written by Jessica Boyle, Maxine Cunningham and Julie Dekens, The International Institute for Sustainable Development, November 2013.* Retrieved April 2020, from https://www.iisd.org/pdf/2013/adaptation_can_infrastructure.pdf

Jacques Whitford Engineering, Scientific, Planning and Management Consultants. (2007). *Stage 1 Archaeological Assessment, Watercourse 5 and 6 Class Environmental Assessment Study, Stoney Creek, City of Hamilton, Ontario.*

MBCA. (1994). *Migratory Birds Convention Act.* Retrieved from http://laws-lois.justice.gc.ca/eng/

MECP. (2019). *Species at risk in Ontario (SARO). Updated July 9, 2019.* Retrieved from https://www.ontario.ca/page/species-risk-ontario

Ministry of Municipal Affairs and Housing. (2020). *Citizen's guide to land use planning - Official Plans - Request an official plan amendment*. Retrieved from https://www.ontario.ca/document/citizens-guide-land-use-planning/official-plans

Ministry of Natural Resources and Forestry. (2020). *Biodiversity Explorer: Ontario Natural Heritage Information Centre (NHIC) database.* Retrieved March 2020

Ministry of the Environment, Conservation and Parks. (2020). *Source Protection Information Atlas. Ministry of the Environment, Conservation and Parks.* Retrieved April 2020, from https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-US

Ministry of Transportation. (2009). *Environmental Guide for Fish and Fish Habitat.*

Ministry of Transportation. (2016). *DF Curve Lookup*. Retrieved from http://www.mto.gov.on.ca/IDF_Curves/terms.shtml

MNRF. (2000). *Significant Wildlife Habitat Technical Guide. 151 pp.*

Municipal Engineers Association. (October 2000, as amended in 2007, 2011 & 2015). *Municipal Class Environmental Assessment.* Retrieved 2020, from https://municipalclassea.ca/manual/page1.html

NHIC. (2019a). *NHIC List of Ontario Birds. Ontario Natural Heritage Information Centre Home Page.* Retrieved from http://nhic.mnr.gov.on.ca/ MNR/nhic/species/listout.cfm?el=ab

NHIC. (2019b). *Srank Definitions.* Retrieved from http://nhic.mnr.gov.on.ca/MNR/ nhic /glossary/srank.cfm

OBBA. (2001). *Guide for Participants. Atlas Management Board, Federation of Ontario Naturalists, Don Mills. 34pp.*

Schwetz. (2014a). *Hamilton Natural Areas Inventory Project 3rd Edition – Site Summaries Document. Report prepared by the City of Hamilton, Hamilton Conservation Authority, and Hamilton Naturalists Club.*

Schwetz. (2014b). *Hamilton Natural Areas Inventory Project 3rd Edition - Species Checklist Document. Report prepared by the City of Hamilton, Hamilton Conservation Authority, and Hamilton Naturalists Club.*

Smith, P. (2014). *The Breeding Birds of Hamilton, Ontario. In Schwetz, N. (ed.). 2014. Hamilton Natural Areas Inventory Project 3rd Edition - Species Checklist Document. Pages 216 to 265.*

Stantec Consulting Ltd. (2007). *Lake Ontario Collaborative Intake Protection Zone Studies - Volume 1: Woodward Avenue Water Treatment Plant, Hamilton.* Retrieved April 2020, from http://protectingwater.ca/docandmaps.cfm?smocid=1452&parentcatid=837

Statistics Canada. (2017). *Hamilton, C [Census subdivision], Ontario and Hamilton, CDR [Census division], Ontario (table). Census Profile.*, 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017. Retrieved April 2020, from https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E

Wood. (2020). *Aquatic Assessment Report - Gordon Dean Avenue - Schedule 'C' Municipal Class Environmental Assessment (Phases 3 & 4). May 2020.*

wood.