

CITY OF HAMILTON

# ENVIRONMENTAL ASSESSMENT STUDY – KING STREET WEST (DUNDAS) BRIDGE #248 PROJECT FILE REPORT

NOVEMBER 23, 2017







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CITY OF HAMILTON

FINAL REPORT

PROJECT NO.:161-09178

DATE: NOVEMBER 2017

WSP

100 COMMERCE VALLEY DRIVE WEST  
THORNHILL, ONTARIO L3T 0A1

PHONE: +1 905-882-1100

FAX: +1 905-882-0055

WSP.COM





November 23, 2017

Public Works Department, City of Hamilton  
77 James Street North, Suite 400  
Hamilton, ON  
L8R 2K3

**Attention: Ms. Janelle Trant, Project Manager, Transportation Management**

**Subject:** Municipal Class Environmental Assessment, Schedule B  
King Street West (Dundas) Bridge #248  
Project File Report

Dear Ms. Trant:

Enclosed please find the Project File Report, including complete sets of the Appendices, for the King Street West (Dundas) Bridge #248. The report is prepared as part of the Municipal Class Environmental Assessment Study for the replacement of King Street West (Dundas) Bridge located on King Street West approximately 160 m west of Bond Street within the community of Dundas, and is identified as part of Lot 13, Concession 1 West Flamborough, City of Hamilton.

Please do not hesitate to contact the undersigned with any questions or comments regarding this document.

Yours sincerely,

A handwritten signature in blue ink that reads 'Mehemed Delibasic'.

Mehemed Delibasic, M.Sc., P. Eng.  
Manager, Transportation Planning









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# SIGNATURES

## PREPARED BY



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Mehemed Delibasic, P.Eng.  
Manager, Transportation Planning

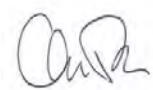
## REVIEWED BY



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Pat Becker, M.E.S  
Sr. EA Consultation Specialist

## REVIEWED BY



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Andrew Roberts, M.A.Sc  
Team Leader, Approvals and Permitting  
Environment



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## **APPENDICES**

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- B** NATURAL HERITAGE INVENTORY REPORT
- C** HERITAGE IMPACT ASSESSMENT (HIA) REPORT
- D** TRANSPORTATION AND TRAFFIC ANALYSIS



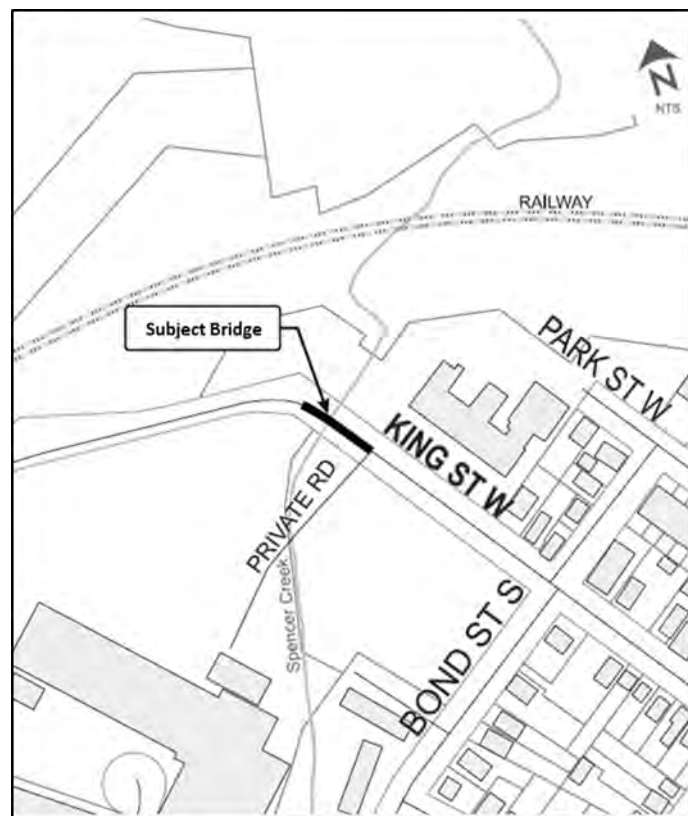


# 1 INTRODUCTION

## 1.1 PROJECT BACKGROUND

WSP has been retained by the City of Hamilton to complete the Municipal Class Environmental Assessment (EA) process to address needed improvements for the King Street West (Dundas) Bridge (#248) (herein referred to as the King Street West Bridge) (Figure 1-1). The King Street West Bridge is located at the crossing of King Street West / Highway 8 and Spencer Creek, just north of the intersection with Bond Street North.

Figure 1-1 Project Study Area



The bridge is within the community of Dundas, and is identified as part of Lot 13, Concession 1 West Flamborough, in the City of Hamilton.

This study examines various options such as do nothing, rehabilitate the existing bridge, replace the bridge at existing location, and replace the bridge and realign King Street West.

The King Street West Bridge provides a connection between the communities of Dundas and Greensville, crossing over Spencer Creek. The bridge consists of two vehicular traffic lanes located over the river, and has an operational status of being open and in use. There is a sidewalk along the east side of the bridge. In 2004 the bridge underwent rehabilitation. In 2009, a bridge condition survey and load evaluation assessment were conducted which found several major deficiencies. A bi-annual monitoring program has been underway since 2012. In addition to the bi-annual monitoring, a detailed delamination survey was completed in 2015. Results from this study, which were also re-stated in a report dated March 2016, identified that the bridge is in need of extensive rehabilitation work.

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## 1.2 POLICY CONTEXT

A number of City and Provincial policies and plans highlight the need for major structural/bridge and road improvements such as those proposed for King Street West Bridge and King Street West in the Study Area.

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### 1.2.1 CITY OF HAMILTON URBAN OFFICIAL PLAN (2013) AND RURAL OFFICIAL PLAN (2012)

The City of Hamilton has two Official Plans (OPs). The Rural Hamilton OP (RHOP, 2012) applies to lands that are within the rural areas of the City, and the Urban Hamilton OP (UHOP, 2013) applies to the lands within the urban area of the City. The King Street West Bridge and the lands south of the bridge fall within the urban area of the City, and therefore the UHOP applies. The lands north of King Street West Bridge are a part of the RHOP. As such, policies from both plans were reviewed.

Schedule B (B1 through B8) of both official plans identify the natural heritage system and natural heritage features found within their respective jurisdictions. The area surrounding Spencer Creek has been identified as a core area within the City of Hamilton's natural heritage system. Core areas are the most important components of the natural heritage system in terms of biodiversity, productivity, ecological function and hydrological function. It is the intent of both official plans to preserve and enhance core areas including the ecological and hydrological function provided by these areas.

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### 1.2.2 CITY OF HAMILTON URBAN OFFICIAL PLAN

The OP is a guiding document that outlines the goals and policies of the City of Hamilton. It provides direction and guidance on the management of communities, land use change and physical development. The Urban Hamilton Official Plan, effective 2013, is the first Official Plan to include the amalgamated communities of

Ancaster, Dundas, Flamborough, Glanbrook, Hamilton and Stoney Creek, replacing seven former plans including the Region of Hamilton-Wentworth Official Plan and six Official Plans representing the former municipalities in the former Region.

Hamilton's OP is centred on the following principles:

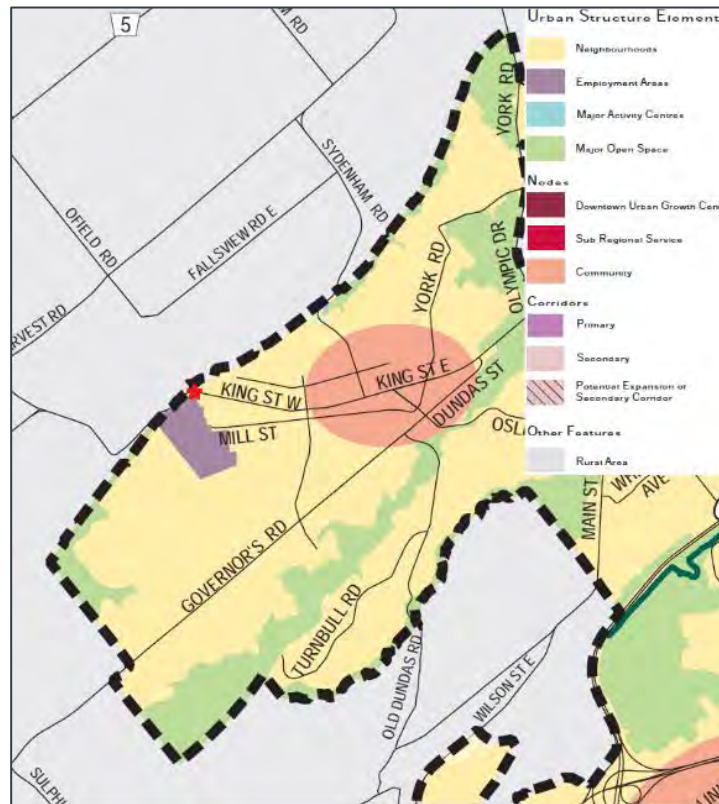
- *Compact and healthy urban communities that provide opportunities to live, work, play, and learn;*
- *A strong rural community protected by firm urban boundaries;*
- *Environmental systems – land, air and water – that are protected and enhanced;*
- *Balanced transportation networks that offer choice so people can walk, cycle, take transit, or drive, and recognize the importance of goods movement to our local economy;*
- *A growing, strong, prosperous and diverse economy;*
- *Financial stability; and*
- *Strategic and wise use of infrastructure services and existing built environment.*

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### **URBAN STRUCTURE**

The OP includes an Urban Structure Plan which provides an overview of the key structuring elements within the City, including neighbourhoods, employment areas, activity centres, nodes and corridors. The King Street West Bridge is located within an area designated as Neighbourhood with an Employment area to the immediate south. A Community Node is designated to the east of the area of the EA Study Area (Figure 1-2).

Figure 1-2 Urban Structure Plan



Source: City of Hamilton. (2013). Urban Hamilton Official Plan.

Per the OP, Neighbourhoods consist primarily of residential uses and complementary facilities and services intended to serve the residents. Neighbourhoods permit arterial commercial type uses, including services catering to the travelling consumer, as well as retail stores that require extensive land or outdoor storage and cannot be appropriately accommodated in Urban Nodes. Neighbourhoods are regarded as stable areas with each one having unique scale and character. Compatible changes with the existing character and function of the Neighbourhood are permitted. Intensification developments are considered within the context of the Neighbourhood.

While outside the area of EA focus, Employment Areas function by providing employment through a broad range of uses. Uses which support the businesses and employees in the area are permitted. This excludes major retail uses or residential uses. They provide for a diverse range of employment opportunities.

The Community Node outside of the EA study area is the former Downtown of Dundas. Within the Node, a range of uses is permitted that allow for access to housing, employment, services and recreation. This is intended to represent a mixed use environment. The Community Nodes function as a vibrant, mixed use

area with a planned employment density of 100 persons/jobs per hectare. They are planned to accommodate some residential intensification over time, to be established through Secondary Plans.

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### *1.2.3 HAMILTON CITY-WIDE TRANSPORTATION MASTER PLAN (CITY IN MOTION) (2007)*

Hamilton's Transportation Master Plan (2007) was created to develop policies and strategies for the transportation network over the next 30 years. This network includes roads, transit, cycling facilities, walking facilities, and the City's connections to rail, marine and aviation facilities.

Currently, the City is undertaking a review and update of the city-wide Transportation Master Plan (TMP) to guide the future of transportation programs and investment to accommodate future growth for 2031 and beyond.

The problem/opportunity (vision) statement of the TMP review and update is to provide a comprehensive and attainable transportation blueprint for Hamilton as a whole that balances all modes of transportation to become a healthier city. The success of the plan will be based on specific, measurable, achievable, relevant and programmed results.

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### *1.2.4 RECREATIONAL TRAILS MASTER PLAN (2016)*

The goal of Hamilton's Recreational Trails Master Plan is to guide the development of a connected, comprehensive, accessible and sustainable multiuse trails network throughout the City of Hamilton and to surrounding communities to improve health and wellness for pedestrians, cyclists and trail users.

King Street West/Highway 8 within the Study Area is identified in the 2016 Recreational Master Plan as a proposed trail/initiative, which will improve active transportation and integrate off-road trails with the planned on-road cycling networks to better address broader community land use and transportation goals and objectives.

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### *1.2.5 HAMILTON'S CYCLING MASTER PLAN (2009)*

The City of Hamilton's Cycling Master Plan, *Shifting Gears* (2009), is intended to guide the development and operation of cycling infrastructure for the next twenty years. This plan is an update to the previous cycling master plan (*Shifting Gears*, 1999).

The Cycling Master Plan is primarily focused on developing new on-road facilities, connecting wherever possible to existing or planned off-road facilities, as identified in the Hamilton Recreational Trails Master Plan. The focus is on commuter, utilitarian and recreational cycling, recognizing that recreational cycling is often the first step

toward commuting or utilitarian use. Currently the City is undertaking a review and update of the Cycling Master Plan as part of the TMP review and update.

King Street West/Highway 8 within the Study Area is identified in Hamilton's 2009 Cycling Master Plan as a proposed route, which will provide convenient and all-season access to residential and employment areas.

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### 1.2.6 HAMILTON CONSERVATION AUTHORITY POLICY AREA

The *Conservation Authorities Act* gives individual conservation authorities the power to regulate development and activities in or adjacent to river or stream valleys, Great Lakes and large inland lakes and shorelines, watercourses, hazardous lands and wetlands. Regulations made under the *Conservation Authorities Act* specify the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulations managed by individual Conservation Authorities. These regulations apply to lands within river or stream valleys, flood plains, wetlands, watercourses, lakes, hazardous lands or lands within 120 m of a Provincially Significant Wetland or wetlands greater than 2 hectares, or lands within 30 m of non-provincially significant wetlands. Development or site alteration within these regulated areas may be permitted provided development is conducted in accordance with existing policies.

The Study Area is located within the Hamilton Conservation Authority (HCA) jurisdiction. Regulation 161/06 made under the *Conservation Authorities Act* specifies the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulations managed by the HCA. Development or site alteration within these regulated areas may be permitted by the HCA if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution, or the conservation of land will not be affected by the development.

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### 1.2.7 PROVINCIAL POLICY STATEMENT

The current Provincial Policy Statement (PPS) was introduced in March, 2005 and revised in April, 2014 (Ministry of Municipal Affairs and Housing, 2014, under the *Planning Act*). It aims to guide appropriate development while protecting resources of provincial interest, public health and safety, and the quality of the natural environment.

Policies regarding Building Strong Communities focus on the orderly development of land including works necessary to meet the current and projected need for infrastructure.

The PPS also encourages the planning of infrastructure to be integrated with the planning for growth to meet the current and projected needs of the area. It also encourages the improvement of existing infrastructure prior to the development of

any new infrastructure within a municipality/region. Specially, the PPS (Section 1.6.3) states:

- *The use of existing infrastructure and public service facilities should be optimized; and opportunities for adaptive re-use should be considered, wherever feasible.*

The PPS also encourages the development of transportation systems that are safe, reliable, and encourage the free movement of persons and goods from one area to another. Specially, the PPS (Section 1.6.7.1 and Section 1.6.7.2) states:

- *Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs.*
- *Efficient use shall be made of existing and planned infrastructure.*

It is clear from the PPS that optimizing existing public infrastructure, including roadways and associated infrastructure, to a standard that encourages the free and safe movement of persons and goods is desirable.

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### 1.2.8 NIAGARA ESCARPMENT PLAN

In 1990, the United Nations Educational, Scientific and Cultural Organization (UNESCO) named Ontario's Niagara Escarpment a World Biosphere Reserve. This designation recognizes the natural features and ecological importance of the Escarpment and endorses the Niagara Escarpment Plan (NEP).

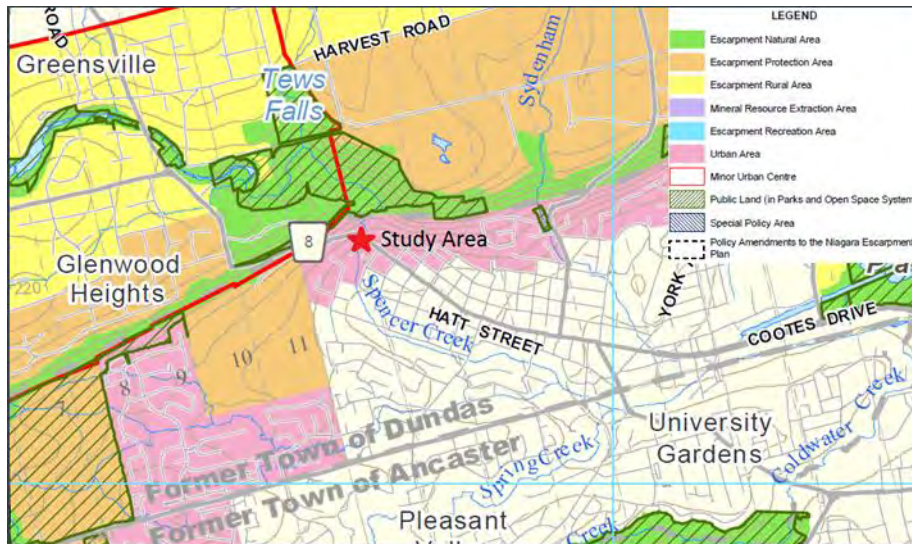
The *Niagara Escarpment Planning and Development Act* established a planning process to ensure that the area would be protected. From this emerged the Niagara Escarpment Plan which serves as a framework of objectives and policies to strike a balance between development, preservation and the enjoyment of this important resource.

The purpose of the NEP is to provide for the maintenance of the Niagara Escarpment and land in its vicinity substantially as a continuous natural environment, and to ensure only such development occurs as is compatible with that natural environment (Niagara Escarpment Plan, 2015).



The Study Area is located within the Urban Designation of the NEP, as shown in Figure 1-3.

Figure 1-3 Niagara Escarpment Plan Context



Source: Niagara Escarpment Commission (2015). Niagara Escarpment Plan Map 2.

### 1.2.9 GREENBELT PLAN

The Greenbelt Plan (Government of Ontario, 2005) was created to identify where urbanization should not occur within the Golden Horseshoe Region of Southern Ontario, to provide permanent protection to the agricultural land base and the ecological features and functions occurring on this landscape. It builds upon ecological protections provided by, and includes land found within, both the Niagara Escarpment Plan and Oak Ridges Moraine Conservation Plan.

This Greenbelt Plan builds upon the existing policy framework established in the Provincial Policy Statement (PPS), issued under Section 3 of the *Planning Act*, and its implementation through municipal official plan policies and maps. Based on the above, the Greenbelt Plan must be read in conjunction with all other land use planning policy, regulations and/or standards, as amended from time to time. These documents include the PPS, provincial land use plans, upper, lower and single-tier municipal official plans, zoning by-laws, regulations under the *Conservation Authorities Act* and the federal *Fisheries Act*. Where more specific provincial plans or regulations apply to lands within the Greenbelt, the more specific plan or regulation shall prevail.

The Spencer Creek channel and surrounding floodplain are located within an area designated as Protected Countryside. As such, the policies of the Greenbelt Plan (2005) apply. Protected Countryside lands are intended to build upon lands identified



under the Niagara Escarpment Plan and the Oak Ridges Moraine Conservation Plan by extending beyond the limits of these plans, and by enhancing, connecting and protecting the agricultural and environmental functions of the lands identified under these plans. It is the objective of the Greenbelt Plan that lands designated as Protected Countryside will continue to accommodate a wide range of commercial and industrial uses, as well as support recreational uses such as parks, trails, and golf courses.

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### 1.3 STUDY OBJECTIVES

The objective of this study is to complete Phases 1 and 2 of the Municipal Class EA process in accordance with the planning and design process for Schedule B projects as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Manual (October 2000, as amended in 2007, 2011 and 2015), which is approved under the *Environmental Assessment Act* (EA Act). The Municipal Class EA process enables the planning of municipal infrastructure projects in accordance with a proven procedure for protecting the environment.

At the end of Phase 2, the project team will confirm that the appropriate Schedule is being followed and if Schedule C is determined to be applicable then Phases 3 and 4 of the Class EA process would be required.

There is an opportunity at any time during the Class EA process for public and stakeholders/agencies to provide input, including participation and input at the Public Information Centre (PIC).

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### 1.4 PROBLEM OR OPPORTUNITY STATEMENT

Under the Municipal Class Environmental Assessment (MCEA) process, proponents are required to develop and document problems and opportunities that provide reasonable justification to proceed with the project.

The Problem/Opportunity Statement for the King Street West Bridge Municipal Class EA is defined as follows:

**Identify the preferred alternative for improvements to the King Street West Bridge. Improvements are required to address the existing condition of the structure.**

In addressing the problem/opportunity statement, consideration was given to:

- current and future travel demands
- accommodating all modes of transportation
- bridge structure and approaches
- user safety
- net positive effect to socio-economic, cultural and natural environments

- aesthetics

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## 1.5 STUDY PROCESS

The Municipal Class EA planning process approved under the EA Act was followed for this project. The Municipal Class EA process allows the City of Hamilton to meet the requirements of the EA Act for municipal infrastructure projects without having to either undertake an Individual EA or request a specific exemption for the project. Municipal projects addressed by the Municipal Class EA may be implemented without further approval under the EA Act, provided the approved Municipal Class EA planning process was carried out.

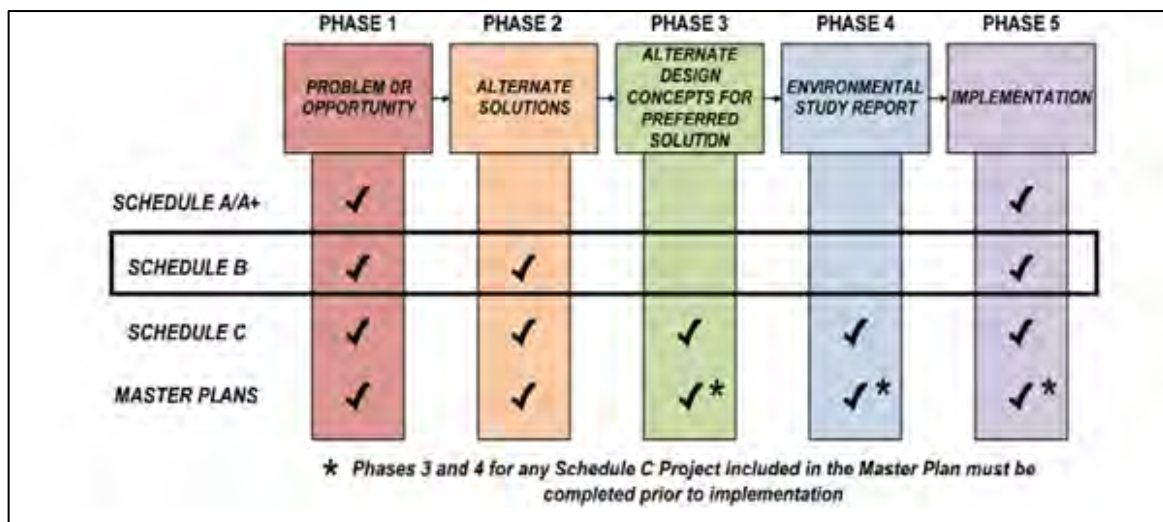
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### 1.5.1 MUNICIPAL CLASS EA SCHEDULES

Since projects undertaken by municipalities vary in their potential impacts, the Municipal Class EA classifies the projects into four schedules according to their potential environmental significance:

- **Schedule A** projects are limited in scale, have minimal adverse effects and include a number of municipal maintenance and operational activities. These projects are approved and may proceed directly to Phase 5 for implementation without following the other phases.
- **Schedule A+** projects are similar to Schedule A projects, however, have the requirement for the public to be advised prior to project implementation. These projects are approved and may proceed directly to Phase 5 for implementation without following the other phases.
- **Schedule B** projects have the potential for some adverse environmental effects, whereby the proponent is required to undertake a screening process (Phases 1 and 2), which includes mandatory contact with directly affected public and relevant review agencies to ensure that they are aware of the project and that their concerns are addressed. Schedule B projects require that a Project File Report be prepared and submitted for review by the public and review agencies. If there are no outstanding concerns, then the municipality may proceed to Phase 5 for implementation, as seen in the figure below.
- **Schedule C** projects have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA Document (Phases 1 to 4). Schedule C projects require that an Environmental Study Report be prepared and submitted for review by the public and review agencies. If there are no outstanding concerns, then the municipality may proceed to Phase 5 for implementation.

The main phases and their application to single projects or Master Plans are identified in the following figure illustrating basic process with key features of the Municipal Class EA.



#### 1.4.1.1 SCHEDULE B CLASSIFICATION

This project is classified as a Schedule B undertaking according to the Municipal Class EA (October 2000 and amended in 2007, 2011, and 2015). A Schedule B undertaking must fulfill the first two phases of the MEA Class EA process before moving on to the detail design and implementation. The Municipal Class EA planning phases undertaken for this study are listed below.

##### Phase 1: Identify the Problem / Opportunity

This phase involves not only identifying the problem/opportunity, but also describing it in sufficient detail to formulate a clear problem/opportunity statement. To assist in describing the problem/opportunity, input from review agencies and the public may be solicited.

##### Phase 2: Identify and Evaluate Alternative Solutions to the Problem/Opportunity

This phase involves undertaking the following six steps:

- Identify reasonable alternative solutions to the problem/opportunity;
- Prepare a general inventory of the existing natural, social and economic environments in which the project is to occur;
- Identify the net positive and negative effects of each alternative solution including mitigating measures, where possible;

- Evaluate the alternative solutions and identify a recommended solution;
- Consult with review agencies and the public to solicit comment and input; and
- Select/confirm the preferred solution.

### MANDATORY PRINCIPLES

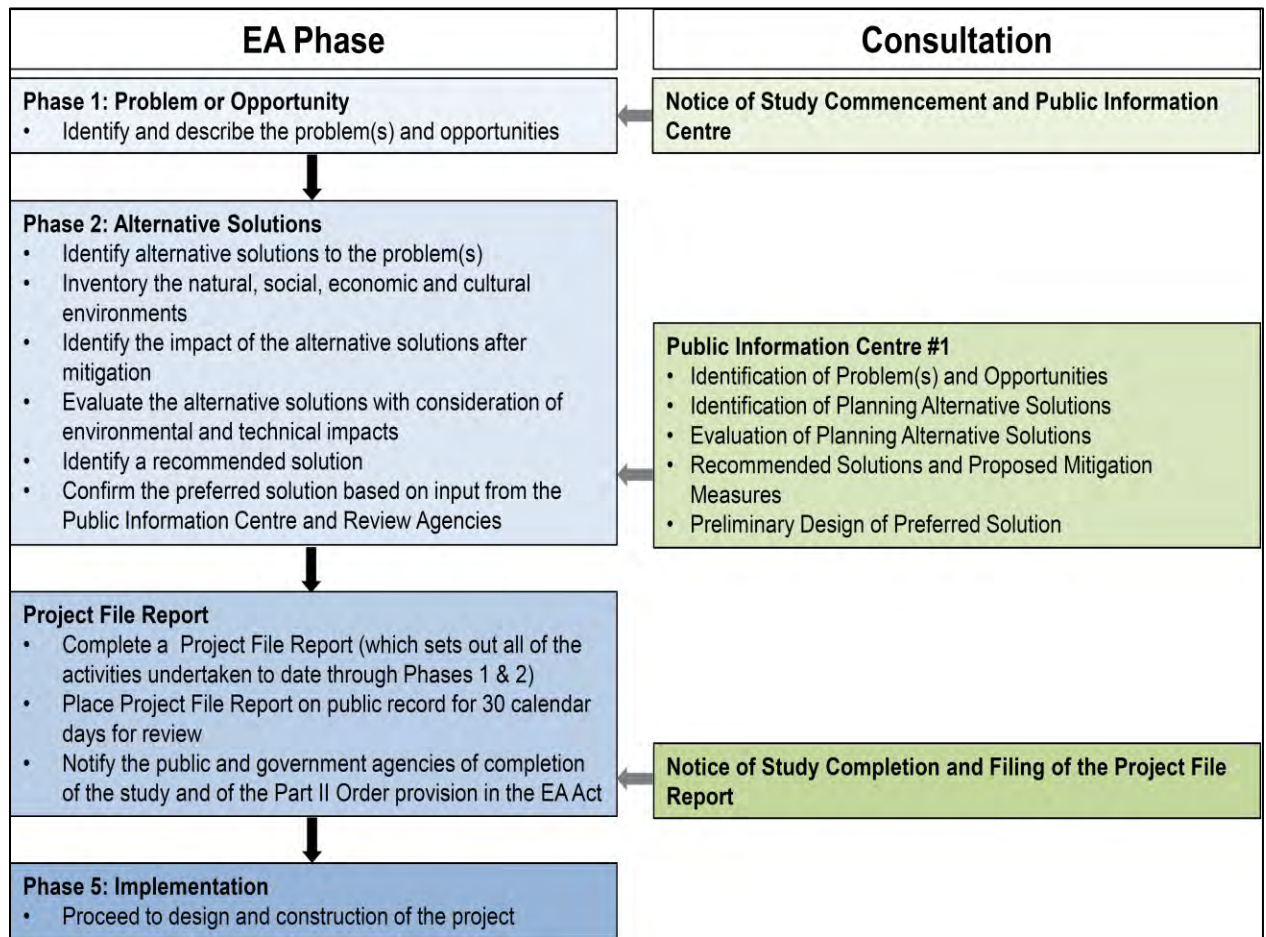
The planning process followed not only adheres to the guidelines outlined by the Municipal Class EA document but reflects the following five mandatory principles of Municipal Class EA planning under the EA Act:

- Consultation with affected parties early on and throughout the process, such that the planning process is a co-operative venture;
- Consideration of a reasonable range of alternatives, both the functionally different alternatives to the project (known as alternative solutions) and the alternative methods of implementing the preferred solution;
- Identification and consideration of the effects of each alternative on all aspects of the environment;
- Systematic evaluation of alternatives in terms of their advantages and disadvantages, to determine their net environmental effects; and
- Provision of clear and complete documentation of the planning process followed, to allow 'traceability' of decision-making with respect to the project.

Following these five principles ensures that the Municipal Class EA process is devoted to the prevention of problems and environmental damage through planning and decision-making, recognizing that research and evaluation of possible impacts have been taken into account prior to implementation of the project.

Figure 1-4 on the following page provides an overview of the Municipal Class EA process for King Street West Bridge Municipal Class EA.

Figure 1-4 Municipal Class EA Process for the King Street West Bridge



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### 1.5.2 CONSULTATION PROGRAM

Recognizing that public and regulatory agency consultation is a significant and integral part of the Municipal Class EA process, a consultation program was initiated from the outset of the study and continued throughout.

The project was initially anticipated to be a Schedule B Municipal Class EA which would only require two mandatory points of contact. These two points of contact are consultation on the alternative solutions (e.g., Public Information Centre (PIC)) and the Notice of Completion. However, it was determined that the Notice of PIC would also be combined with the optional Notice of Study Commencement.

A wide range of stakeholders were identified and contacted at the outset of the study to 'scope' potential issues and areas of interest or concern. Interest in the project was considered to be any feedback received from a stakeholder indicating that they could be directly affected during the planning, construction and/or operation of the proposed undertaking. A number of methods were undertaken to achieve the above stated objectives, including:

- Placement of the Notices of Study Commencement and Public Information Centre 1 and Study Completion within the Dundas Star News community newspaper;
- Scheduling of one Public Information Centre;
- Placement of notices on City's website;
- Distribution of information mailings (e.g., notices) to regulatory agencies, Indigenous Communities and the public during various stages of the study;
- Receiving and responding to written submissions;
- Participation in meetings and telephone discussions with regulatory agencies, utilities, stakeholders, and the public;
- Scheduling of two Technical Advisory Committee (TAC) meetings during Phase 1 of the study; and,
- Placement of this Project File Report on the Public Record and provision of a Notice of Study Completion to stakeholders following Phase 2 of the study.

Appendix A provides additional details on the consultation program.

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### 1.5.3 THE PROJECT FILE REPORT

Prepared following completion of Phase 2, the Project File Report (PFR) documents both phases and is placed on public record for a mandatory review period of at least 30 calendar days to allow for review by stakeholders (including agencies and the public).

This Project File Report outlines the planning process followed by describing:



- existing conditions within the Study Area
- problem and opportunity
- alternative solutions considered to address the problem and opportunity
- evaluation of alternative solutions
- recommended preliminary alternative solution
- public and agency consultation
- description, implementation, mitigation and monitoring of the preferred alternative solution

The PFR is prepared for the public record and provides an opportunity for the public to review the planning and decision-making process used to select a preferred alternative, details the impacts associated with the preferred alternative, outlines proposed measures to mitigate impacts on the natural, social and economic environments, and identifies commitments to future work.

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#### 1.5.4 PART II ORDERS

At the end of the planning and decision-making process, the PFR is placed on the public record for a minimum 30-day review period. If there are any outstanding concerns that are not resolved during project planning, the person or party with the concern must make a written request to the Minister of the Environment and Climate Change for a Part II Order within this review period. The Part II Order is a request that the project be subject to formal governmental review and approval under the *Environmental Assessment Act*. A copy of the Part II Order must be forwarded to the Minister of the Environment and Climate Change and to the City of Hamilton.

If there are no outstanding concerns at the end of the review period, the project will be considered to have met the requirements of the Municipal Class EA process and the municipality may proceed to the final phase of the planning and design phase, Phase 5, Implementation.

## 2 EXISTING AND FUTURE CONDITIONS

This chapter presents an overview of the background information (secondary source information) and the results of the field inventories undertaken for the study, which provides a description of the existing natural, socio-economic, and cultural environments, as well as the transportation conditions.

The background research and field studies, coupled with information obtained through consultation with relevant agencies, were used to determine the significance of the existing natural, socio-economic and cultural features within the Study Area.

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### 2.1 NATURAL ENVIRONMENT

The purpose of a Natural Heritage Inventory is to undertake an inventory of biophysical and biological features present on the site and surrounding areas. A Natural Heritage Assessment was completed for this study between October 2016 and July 2017. The assessment includes review of the work completed by MMM Group Limited (2015), consultation with regulating agencies, and updating field work within the area of influence surrounding the King Street West Bridge. Further details are provided in Appendix B.

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#### 2.1.1 REVIEW OF NATURAL HERITAGE CHARACTERIZATION REPORT

It is understood that MMM Group Limited (now WSP Group Canada Limited), completed a Natural Heritage Characterization Report (2015) for the Site and surrounding area. The study characterized existing natural heritage features, vegetation communities, fish habitat, an evaluation of habitat significance, and potential for presence of Species at Risk (SAR).

The MMM (2015) report noted that several natural heritage features and designated policy areas overlapped the Study Area, including: Spencer Creek, the Spencer Creek Gorge Environmentally Significant Area (ESA), Regionally Significant Woodlands, City of Hamilton Natural Heritage System Core Areas, Greenbelt Plan Natural Heritage System – Protected Countryside, Niagara Escarpment Plan Areas, Spencer Gorge Escarpment Valley Life Science Area of Natural and Scientific Interest (ANSI), Spencer Creek Bedrock Gorge Earth Science ANSI, potential habitat of SAR, and potential Significant Wildlife Habitat (SWH).

The background review for SAR completed by WSP identified that there was potentially habitat for two (2) vegetation species and ten (10) wildlife species. Of the species noted above, only one species, the Bank Swallow, was observed during



WSP field investigations. It was noted that the individual was flying above the Site, and that no nests were found during surveys of the area.

The Study also noted that there was Candidate SWH present, which included Seasonal Concentration Areas for snake hibernacula habitat within the road right-of-way, potential Turkey Vulture Summer Roosting Area, and Bat hibernacula potential outside of the Study Area. Candidate SWH also included Wildlife Movement Corridors, and Rare Vegetation Communities beyond the Study Area.

The Study confirmed SWH for Habitat for Species of Conservation Concern due to the Bank Swallow sighting, and four regionally uncommon and one regionally rare bird species.

### 2.1.2 DESKTOP REVIEW

WSP conducted a survey of the OMNRF NHIC database to determine if there were any known Species at Risk or Species of Conservation Concern on or within 120 m of the Study Area. One (1) square kilometer (1 km<sup>2</sup>) quadrat (17NH8391) surrounding the Study Area was checked to ensure potential Species at Risk were accounted for in the search. Table 2-1 identifies species that have recorded occurrences within the areas searched.

**Table 2-1 Endangered and Threatened Species Habitat Potential Assessment**

SPECIES NAME	STATUS	SPECIES NAME	STATUS
Spotted Wintergreen (Chimaphilia maculata)	END	Forked Panicgrass (Dichanthelium dichotomum)	SRank = S2
American Chestnut (Castanea dentata)	END	Shiny Wedge Grass (Spehnopholis nitida)	SRank = S1
Northern Bobwhite (Colinus virginianus)	END	Northern Hawthorn	SRank = S3
Yellow-breasted Chat (Licteria virens)	END	White Milkweed (Asclepia variegata)	SRank = SX
Woodland Vole (Microtus pinetorum)	SC	Eastern Burning Bush (Euonymus atropurpureus)	SRank = S3
Louisiana Waterthrush (Parkesia motacilla)	SC	Yellow Stargrass (Hyposix hirsuta)	SRank = S3
Milksnake	SC	Bowman's-root (Gillenia trifoliata)	SRank = SX
Pignut Hickory (Carya glabra)	SRank = S3	Eastern Few-fruited Sedge (Carex oligocarpa)	SRank = S3
Large Yellow Pond-Lily (Nuphar lutea)	SRank = S3	Fern-leaved Yellow False Foxglove (Aureolaria pedicularia)	SRank = S2?

SPECIES NAME	STATUS	SPECIES NAME	STATUS
Erect Knotweed ( <i>Polygonum erectum</i> )	SRank = SH	Woodland Pinedrops ( <i>Pterospora andromedea</i> )	SRank = S2
Downy Yellow False Foxglove ( <i>Aureolaria virginica</i> )	SRank = S1	Square-stemmed Rose Pink ( <i>Sabatia angularis</i> )	SRank = SX
Perfoliate Bellwort ( <i>Uvularia perfoliata</i> )	SRank = S1	Scarlet Beebalm ( <i>Monarda didyma</i> )	SRank = S3
Puttyroot ( <i>Aplectrum hyemale</i> )	SRank = S2	White-tinged Sedge ( <i>Carex albicans</i> )	SRank = S3
Clinton's Club-rush ( <i>Trichophorum clintonii</i> )	SRank = S2S3	Panicled Hawkweed ( <i>Hieracium paniculatum</i> )	SRank = S2?
White-haired Panicgrass ( <i>Dichanthelium villosissimum</i> )	SRank = S3	Timber Rattlesnake ( <i>Crotalus horridus</i> )	EXP
Arrowhead Spiketail ( <i>Cordulegaster obliqua</i> )	SRank = S2		

SRank – Nature Conservancy Ranking (NHIC, 2013). 1 – Critically imperiled, 2 – Imperiled, 3 – Vulnerable, 4 – Apparently Secure, 5 – Secure, G – Global Level, S – Sub-national Rank (Ontario)? – Rank Uncertain, X – Presumed extirpated, NA – Conservation Status Rank is Not Applicable at this level. Species at Risk Public Registry (SARA, 2012) or COSEWIC Status Species at Risk in Ontario List (SARO, 2013). EXP – Extirpated, END – Endangered, THR – Threatened, SC – Special Concern.

A survey of the OMNRF NHIC database was also conducted to determine if there were any known ANSIs (Areas of Natural or Scientific Interest), Provincially Significant Wetlands, Wildlife Concentration Areas, or Rare Vegetation Communities on or within 120 m of the Study Area. Spencer Gorge/Webster's Falls Conservation Area, Old Dundas Quarry PA-36 (Earth Sciences ANSI), Niagara Escarpment Biosphere Reserve, Spencer Gorge Escarpment Valley (Life Sciences ANSI), Spencer Creek Bedrock Gorge (Earth Sciences ANSI), and Dundas Creek and Dundas Marsh (Important Bird Area) is located within the region searched.

A survey of the Ontario Breeding Bird Atlas (1st and 2nd version) was conducted to determine if there were any occurrences of avian species at risk within the general area. Species listed in Table 2-2 have been observed in the general area.

Table 2-2 Avian Species at Risk Management

SPECIES NAME	STATUS	SPECIES NAME	STATUS
Least Bittern ( <i>Ixobrychus exilis</i> )	THR	Common Nighthawk ( <i>Chordeiles minor</i> )	SC
Black Tern ( <i>Chlidonius niger</i> )	SC	Eastern Whip-poor-will ( <i>Caprimulgus vociferus</i> )	THR
Chimney Swift	THR	Red-headed Woodpecker	SC
Eastern Wood-Pewee	SC	Bank Swallow	THR
Wood Thrush	SC	Barn Swallow	THR
Golden-winged Warbler ( <i>Vermivora chrysoptera</i> )	SC	Cerulean Warbler ( <i>Setophaga cerulea</i> )	THR
Prothonotary Warbler ( <i>Protonotaria citrea</i> )	END	Louisiana Waterthrush ( <i>Parkesia motacilla</i> )	SC
Bobolink ( <i>Dolichonyx oryzivorus</i> )	THR	Eastern Meadowlark ( <i>Sturnella magna</i> )	THR

Species at Risk Public Registry (SARA, 2012) or COSEWIC Status Species at Risk in Ontario List (SARO, 2013). EXP – Extirpated, END – Endangered, THR – Threatened, SC – Special Concern.

A survey of the Ontario Reptile and Amphibian Atlas was consulted to determine occurrences of herpetofauna species at risk within the general area. Species in Table 2-3 have been observed within the general area.

Table 2-3 Herpetofauna Species at Risk Assessment

SPECIES NAME	STATUS	SPECIES NAME	STATUS
Blanding's Turtle ( <i>Emydoidea blandingii</i> )	THR	Eastern Musk Turtle ( <i>Sternotherus oderatus</i> )	THR
Northern Map Turtle ( <i>Graptemys geographica</i> )	SC	Snapping Turtle ( <i>Chelydra serpentina</i> )	SC
Eastern Ribbonsnake ( <i>Thamnophis sauritis</i> )	SC	Milksnake	SC
Jefferson Salamander ( <i>Ambystoma jeffersonianum</i> )	END		

Species at Risk Public Registry (SARA, 2012) or COSEWIC Status Species at Risk in Ontario List (SARO, 2013). EXP – Extirpated, END – Endangered, THR – Threatened, SC – Special Concern.

A review of aerial photographs was carried out to determine if there is suitable habitat for additional Species at Risk. Based on this review it is reasonable to expect that American Colombo (*Frasera carolinensis*), American Ginseng (*Panax quinquefolius*) (END), Butternut (*Juglans cinerea*) (END) and Eastern Flowering Dogwood (END) may find suitable habitat within the Study Area.

### 2.1.3 FIELD PROGRAM AND REPORTING

Site visits were conducted in fall of 2016 and spring and summer of 2017. The purpose of the site visits was to confirm the presence of Natural Heritage Features, complete a three-season vegetation assessment, document breeding birds, complete a fish habitat and community assessment, and determine the general characteristics of the Study Area. While conducting these site visits WSP biologists identified existing landforms and landscapes, land uses, vegetation composition and structure, wildlife usage, and the presence and extent of natural heritage features within 120 m of King Street West Bridge. Breeding bird surveys were completed on June 20 and July 10, 2017, vegetation surveys were completed on October 5, 2016, June 20, 2017 and July 10, 2017, and the fish habitat and community assessment was completed on July 10, 2017. Site visit details are provided in Table 2-4 and lists of observed species are provided in Appendix B.

Table 2-4 Site Visit Details

DATE	TIME/DURATION	WEATHER CONDITIONS
October 5, 2016	1:35 PM to 3:26 PM	Clear skies, $\pm 25^{\circ}\text{C}$ , light breeze, no trace of precipitation
June 20, 2017	8:30 AM to 11:20 AM	Mostly overcast skies, $\pm 20^{\circ}\text{C}$ , gentle breeze, no trace of precipitation
July 10, 2017	8:02 AM to 1:15 PM	Mostly overcast skies, $\pm 24^{\circ}\text{C}$ , light breeze, no trace of precipitation

### 2.1.4 NATURAL HERITAGE FEATURE SUMMARY

A summary of the significant Natural Heritage Features identified within or adjacent to the Study Area are provided in Table 2-5 below. This summary is based on observations from the Study Area investigations, as well as a review of available documentation pertaining to the Study Area and adjacent lands.

Table 2-5 Natural Heritage Feature Summary

FEATURE	PRESENT	COMMENT
Fish Habitat	Yes	<p>Spencer Creek, identified as a coolwater creek, runs under King Street West Bridge from northeast to southeast (Figure 2-1). Characteristic coolwater fish species found in this reach of Spencer Creek include Longnose Dace and Creek Chub. Four darter species representative of the high gradient nature of this reach of Spencer Creek include Johnny Darter, Rainbow Darter, Fantail Darter and Blackside Darter. Electrofishing surveys completed on July 10, 2017 captured eight species of fish within Spencer Creek, including Northern Hog Sucker, Rainbow Darter, Longnose Dace, River Chub, Rainbow Trout, White Sucker, Creek Chub and Smallmouth Bass.</p> <p>During the Detailed Design phase, mitigation measures should take place which ensure that impacts to the watercourse are minimized and in accordance with the measures established by the Department of Fisheries and Oceans (DFO, 2013).</p>

FEATURE	PRESENT	COMMENT
Habitats of Endangered or Threatened Species	Yes	<p>While the species was not observed, moderate habitat potential for Eastern Flowering Dogwood exists along the forest edges within the Study Area, and low-moderate habitat potential for American Chestnut, American Columbo, American Ginseng and Butternut can be found in the forested portions of the Study Area. These species were not identified during either the 2012-2013 investigations (MMM, 2015) or the 2016-2017 WSP investigations. Low-moderate potential for several species of bats, including Eastern Small-footed Bat, Little Brown Myotis, Northern Myotis and Tri-colored Bat exists in the Study Area. These species were not identified, and suitable man-made structures were not identified during the Study Area investigations.</p> <p>The Mixed Woodland (WOM) (Lee et al., 1998) located within the immediate vicinity of King Street West Bridge did not appear to have suitable snags which may represent candidate maternity roost habitat, however low-moderate potential exists in the Dry - Fresh Sugar Maple - White Ash Deciduous Forest (FODM5-8) and Dry - Fresh Sugar Maple Hardwood Deciduous Forest (FODR1) (Figure 2-2). Future bridge rehabilitation works are not anticipated to impact the forest ecotypes where the above-mentioned species may find habitat. However, if it is determined at the detailed design stage that tree removal may be necessary, an assessment should be undertaken at that time to determine whether these species may find habitat, including the potential for bat maternity roost habitat.</p>

FEATURE	PRESENT	COMMENT
Areas of Natural and Scientific Interest (ANSI)	Yes	The Spencer Gorge Escarpment Valley Life Sciences ANSI is located north of King Street West Bridge on the north side of the railroad tracks, approaching to within approximately 110 m from the bridge location (Figure 2-1).
Significant Wetlands	No	Wetland features, including significant wetlands, were not identified within 120 m of King Street West Bridge.
Significant Coastal Wetlands	No	N/A

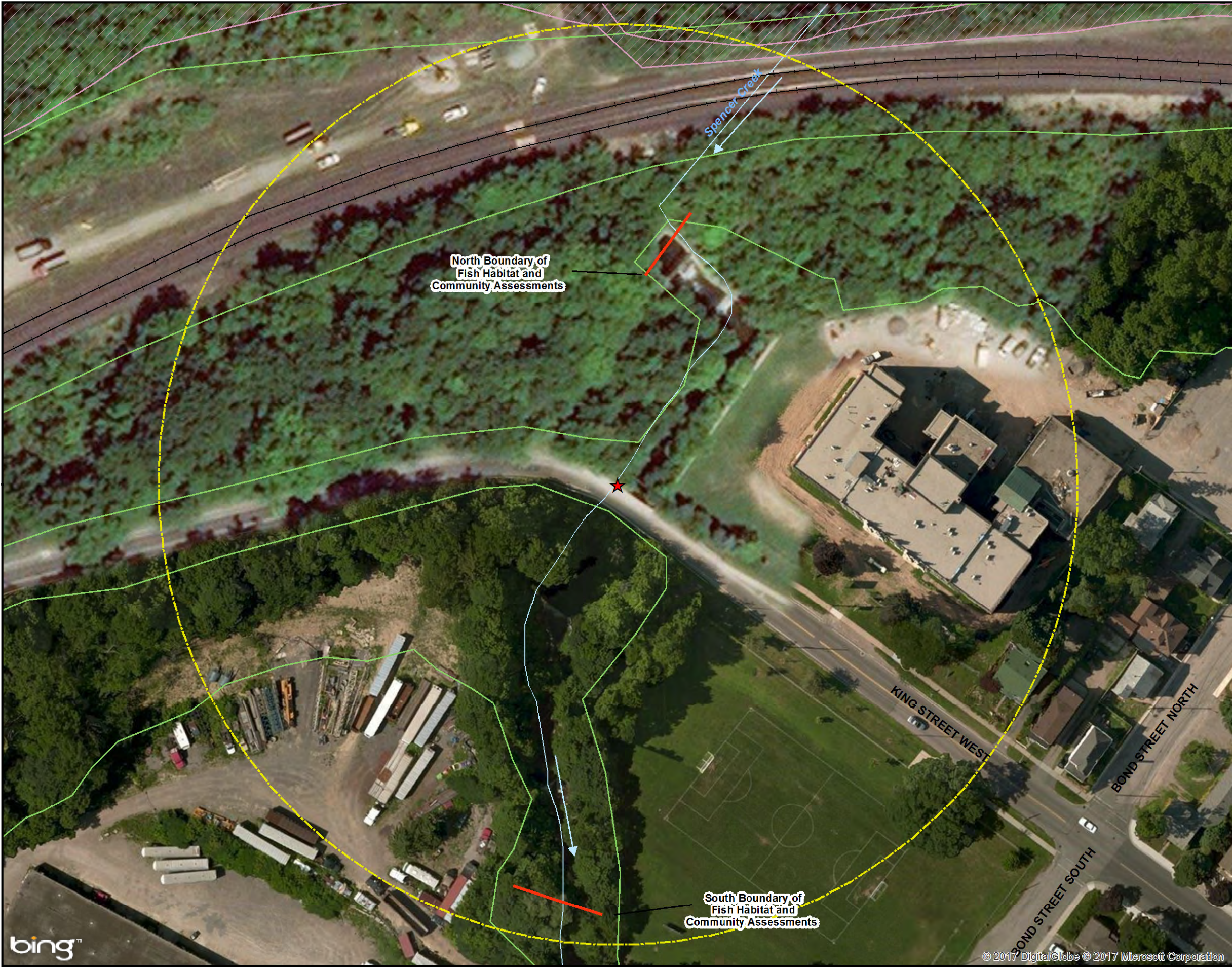
FEATURE	PRESENT	COMMENT
Significant Wildlife Habitat	Yes	<p>The wooded portions of the Study Area are connected to larger forests to the north, associated with the Spencer Gorge Escarpment Valley Life Sciences ANSI which is located as close as 110 m from King Street West Bridge (Figure 2-1). This feature contains Significant Wildlife Habitat (SWH), including several classes of SWH which can also be found in the forest ecotypes in the southwest and north portions of the Study Area.</p> <p>These include candidate bat maternity roost habitat and habitat for Species at Risk including American Chestnut, American Columbo, American Ginseng, Butternut, Eastern Small-footed Bat, Little Brown Myotis, Northern Myotis, Tri-colored Bat, Eastern Wood-Pewee and Wood Thrush. Impacts to this feature are not anticipated, as proposed development as part of the Municipal Class EA will be limited to the immediate vicinity of King Street West Bridge. Additionally, the presence of a CN rail line is located between the bridge and the ANSI.</p> <p>Within the Study Area, moderate habitat potential for Eastern Flowering Dogwood was identified, though the species was not observed during either the 2012-2013 MMM Group (now WSP) investigations or the 2016-2017 investigations.</p>
Significant Woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River)	Yes	<p>All of the wooded areas found within the Study Area have been identified as Significant Woodlands according to the City of Hamilton Urban (2013) and Rural (2012) Official Plans. Within the riparian corridor of Spencer Creek the treed areas have been identified using Ecological Land Classification (ELC) (Lee et al., 2008) as Mixed Woodland (WOM). Further away from Spencer Creek and north of King Street West, the woodland transitions into a</p>



FEATURE	PRESENT	COMMENT
		<p>mid-aged Dry - Fresh Sugar Maple - Hardwood Deciduous Forest (FODR1), while south of King Street West and west of Spencer Creek the forest composition was very similar to the Dry - Fresh Sugar Maple - Hardwood Deciduous Forest located north of King Street West; however, White Ash represented a higher proportion of the canopy.</p> <p>Impacts to the significant woodland will be minor in nature, as disturbance will be limited to the immediate vicinity of King Street West Bridge. Further, the trees most likely to be impacted consist predominately of low quality, non-native and ornamental species, including Manitoba Maple, Siberian Elm, Norway Maple and White Mulberry. At the Detailed Design stage, if impacts to trees are anticipated, a survey by a qualified arborist should be completed and an Arborist Report and Tree Preservation Plan should be submitted.</p>

FEATURE	PRESENT	COMMENT
Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River)	Yes	<p>While not identified as a Significant Valleyland in the City of Hamilton Urban (2013) and Rural (2012) Official Plans, the riparian corridor surrounding Spencer Creek meet the qualifications of a Significant Valleyland established by the Provincial Policy Statement (OMMAH, 2014). From 60 m north of King Street West Bridge to 40 m south of the bridge, the channel is man-made and composed primarily of concrete, armor stone and etched bedrock.</p> <p>Impacts to the Significant Valleyland will be limited to the area immediately adjacent to King Street West Bridge and will temporary in nature. Tree removal, if required, is anticipated to be limited in scope. During the Detailed Design phase, mitigation measures must ensure that impacts to the Significant Valleyland are minimized and follow the criteria established by regulating agencies.</p>





55 KING STREET, SUITE 600  
ST. CATHARINES, ONTARIO CANADA L2R 3H5  
TEL.: 905-687-1771 | FAX: 905-687-1773 | WWW.WSP.COM

LEGEND		
	BRIDGE 248	
	120 m STUDY AREA	
	ANSI (SPENCER GORGE ESCARPMENT VALLEY)	
	WOODED AREA (MNR)	
	WATERCOURSE	

Data Source: Ministry of Natural Resources, Ontario Base Mapping, October 2016.

CLIENT:		
CITY OF HAMILTON		

PROJECT:		
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT BRIDGE #248 KING STREET WEST, COMMUNITY OF DUNDAS, CITY OF HAMILTON		

PROJECT NO:	DATE:
161-09178-00 122	JULY 2017

DESIGNED BY:
-

DRAWN BY:
T.P.

CHECKED BY:
-

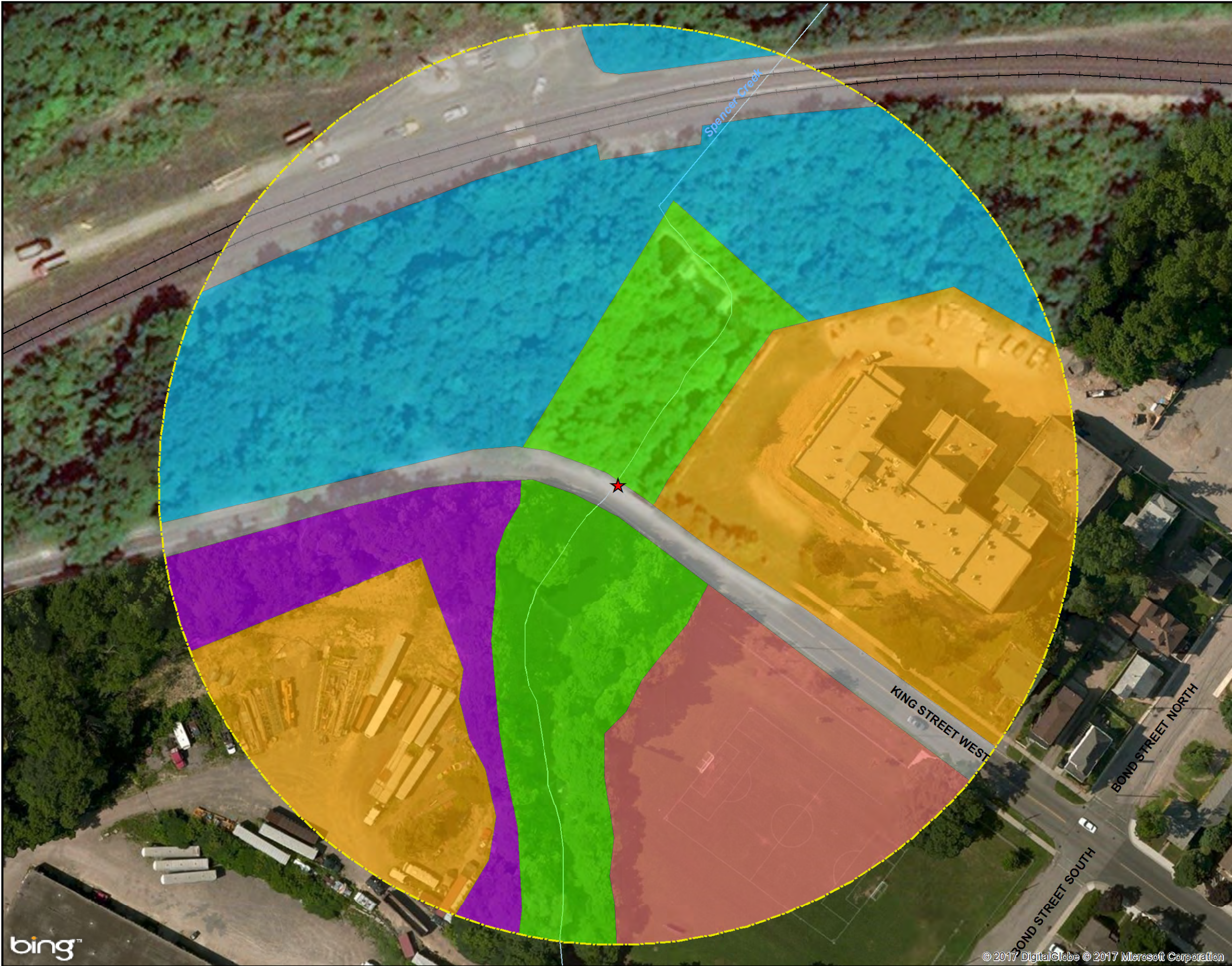
FIGURE 2 - 1	SCALE:
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TITLE:		
NATURAL HERITAGE FEATURES		

DISCIPLINE:		
ENVIRONMENT		

ISSUE:	REV.:
-	-





55 KING STREET, SUITE 600  
ST. CATHARINES, ONTARIO CANADA L2R 3H5  
TEL.: 905-687-1771 | FAX: 905-687-1773 | WWW.WSP.COM

- LEGEND**
- ★ BRIDGE 248
  - 120 m STUDY AREA
  - WATERCOURSE
  - CONSTRUCTED GREEN LANDS-RECREATIONAL (CGL\_4)
  - BUSINESS SECTOR (CVC\_1)
  - TRANSPORTATION (CVL\_1)
  - DRY-FRESH SUGAR MAPLE-WHITE ASH DECIDUOUS FOREST (FODM5-8)
  - DRY-FRESH SUGAR MAPLE-HARDWOOD DECIDUOUS FOREST (FODR1)
  - MIXED WOODLANDS (WOM)



10 5 0 10 Metres  
Data Source: Ministry of Natural Resources, Ontario Base Mapping, October 2016.

CLIENT:  
  
CITY OF HAMILTON

PROJECT:  
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT  
BRIDGE #248  
KING STREET WEST,  
COMMUNITY OF DUNDAS, CITY OF HAMILTON

PROJECT NO: 161-09178-00 122	DATE: JULY 2017
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DESIGNED BY: -
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DRAWN BY: T.P.
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CHECKED BY: -
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FIGURE 2 - 2	SCALE: 1:1,000
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TITLE:  
  
ECOLOGICAL LAND CLASSIFICATION

DISCIPLINE:  ENVIRONMENT
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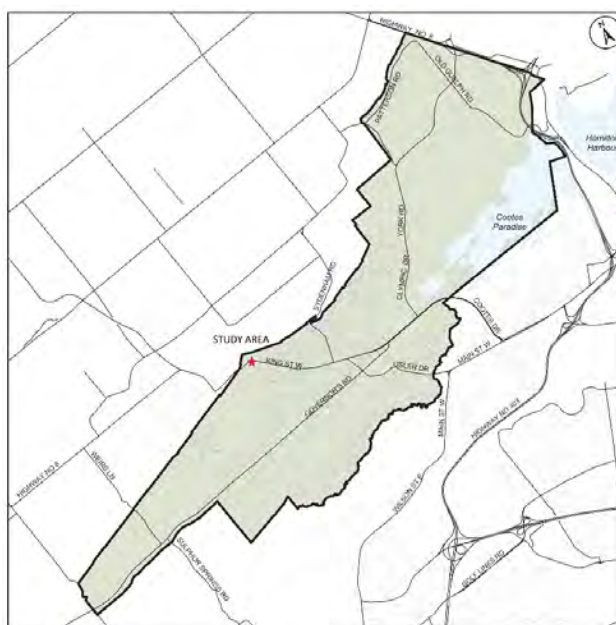
ISSUE: -	REV.: -
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## 2.2 SOCIO-ECONOMIC ENVIRONMENT

The Study Area is located in Ward 13, an urban and rural ward comprised of the former Town of Dundas. Ward 14 is immediately adjacent to Ward 13 and the Study Area. Ward 13 is situated in the Dundas Valley and is bordered by the northern and southern edges of the Niagara Escarpment up to Binkley Road. The east and south-east border runs along Highway 6, Highway 403, Cootes Paradise and the lower edge of the Escarpment between Dundas and Ancaster, as shown in Figure 2-3.

Figure 2-3 Dundas Community, Ward 13



Source: City of Hamilton Ward Profiles: Ward 13

### 2.2.1 CITY LAND USE DESIGNATIONS

Ward 13 has the highest percentage of open space land use of all wards in Hamilton. Open spaces makes up 48% (approximately 1027 hectares) of all land uses. These open spaces uses are found primarily in the Dundas Valley Conservation Area.

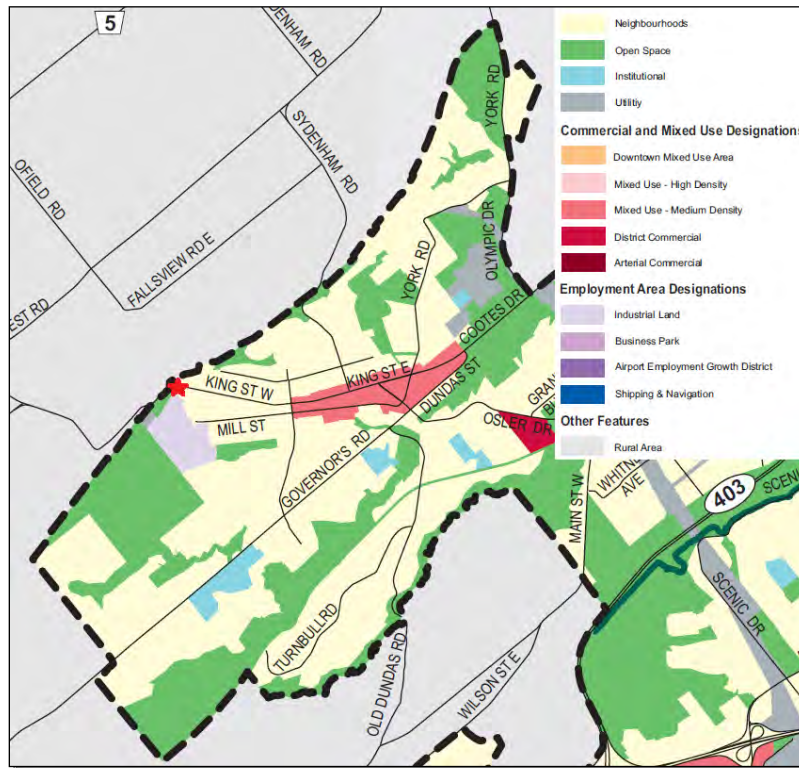
Residential land use is the second largest. Approximately 28% or 1027 hectares of land within the Ward is residential use. Outside of the urban area, agricultural land use is significant making up approximately 9% or 184 hectares. Industrial lands make up only 1 % of the land area in Dundas.

In the immediate vicinity of the Study Area, the land use is predominantly residential, designated as 'Neighbourhood' in the OP. Open space urban uses, as well as

industrial lands are also present. The Mixed Use Medium Density land use is designated along King Street East, to the east of the Study Area. These land uses are shown in Figure 2-4.

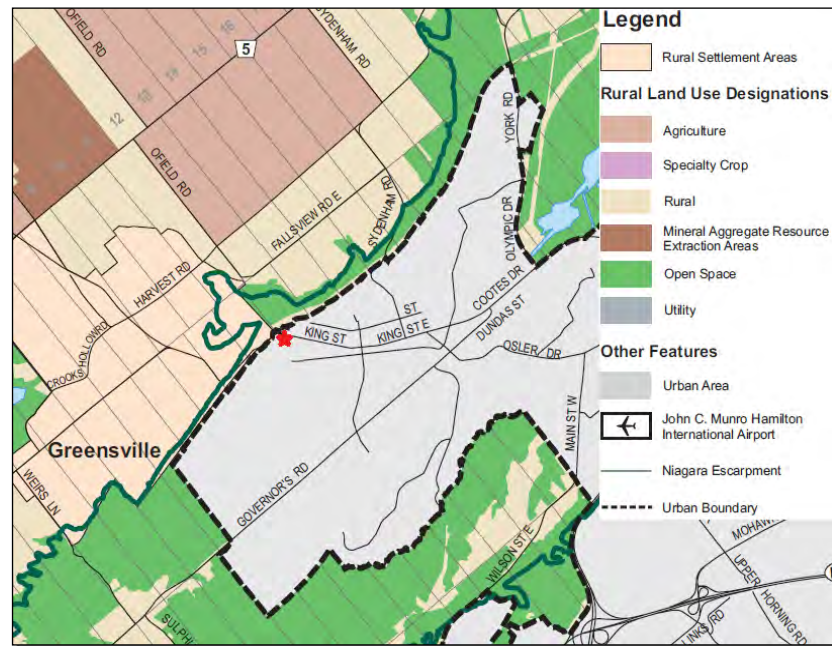
Residential land uses are predominately low density in the vicinity of the Study Area, with a medium density development immediately adjacent to King Street West Bridge (District Lofts).

Figure 2-4 Urban Land Use Designations



Source: City of Hamilton. (2013). Urban Hamilton Official Plan

Figure 2-5 Rural Land Use



Source: City of Hamilton. (2012). Rural Hamilton Official Plan

To the north the Rural OP and land use designations apply as shown in Figure 2-5. The Niagara Escarpment is noted in the figure. The predominant land uses in the immediate vicinity of King Street West Bridge are Rural, Rural Settlement Areas and Open Space.

The Rural designation applies to lands that are characterized as having lower capability for agriculture due to a range of factors. These lands are however protected to maintain agricultural use as the primary land use.

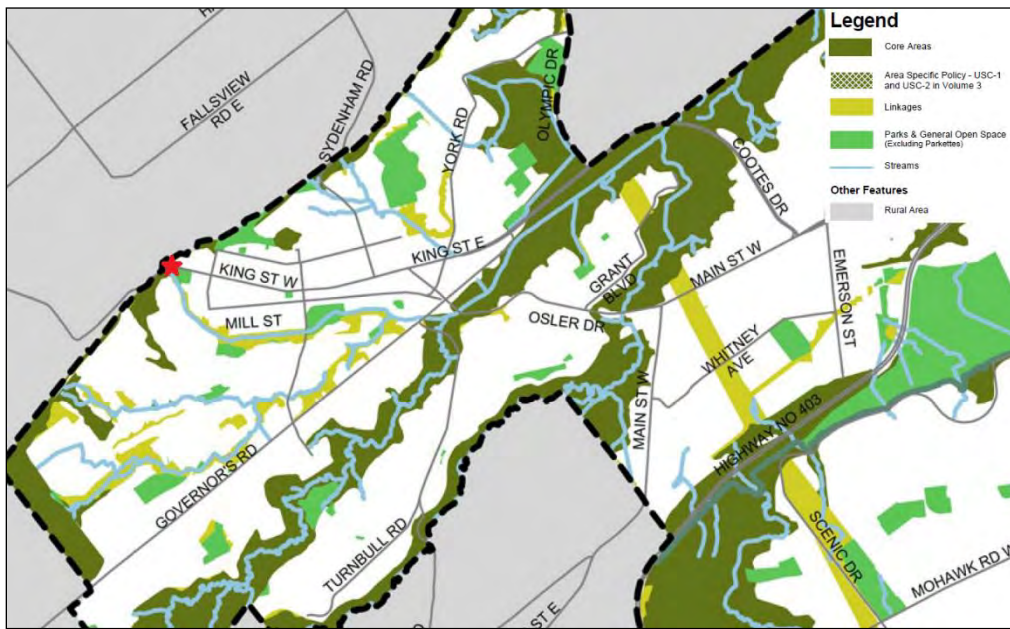
Rural Settlement Areas are areas where a variety of land uses and developments have clustered in a small scale outside of the designated Urban Area. These areas are intended to be residential and services centres that serve the immediate community and surrounding rural areas.

### 2.2.2 NATURAL HERITAGE SYSTEM

The Natural Heritage System consists of the Niagara Escarpment Plan area, and Core Areas and Linkages identified by the City, based on requirements of the Provincial Policy Statement.

King Street West Bridge straddles the Core Area of the Natural Heritage System, and is immediately adjacent to an area of Parks and Open Space (Fishers Mill Park) as shown in Figure 2-6.

Figure 2-6 Urban Natural Heritage System



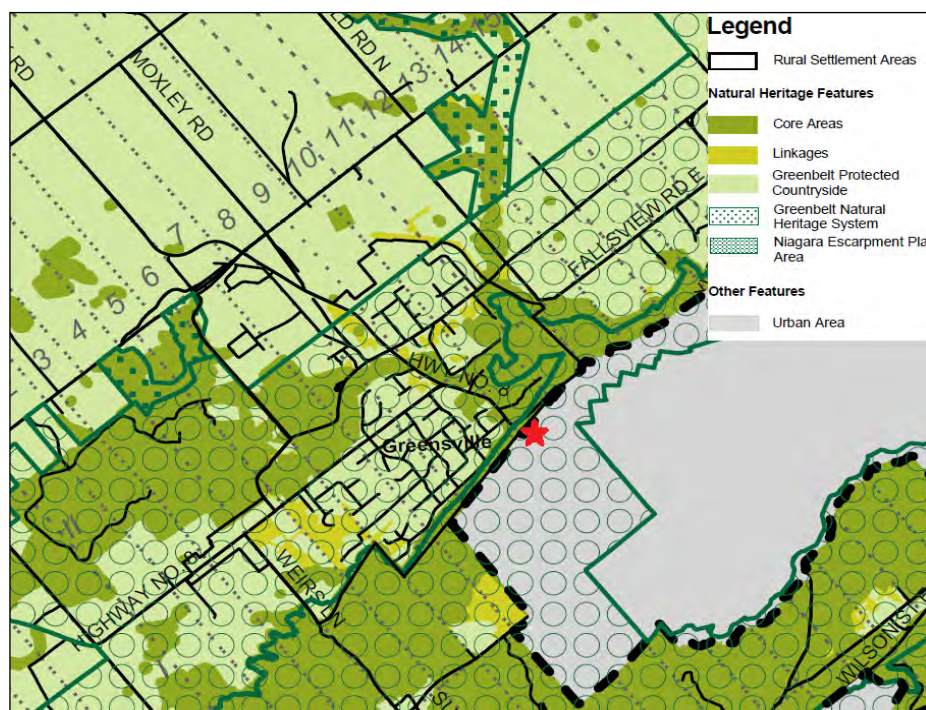
Source: City of Hamilton. (2013). Urban Hamilton Official Plan

The OP policy regarding Core Areas is to preserve and enhance them, and to ensure that any site development within or adjacent to them does not negatively impact natural features and ecological functions. Core Areas include key natural heritage features and local natural areas and are identified as having the most important components in terms of biodiversity, productivity and ecological and hydrological functions. These features and functions are protected; vegetation removal is generally not permitted.



The Rural Natural Heritage System north of King Street West Bridge is composed of core areas, as shown in Figure 2-7 below.

Figure 2-7 Rural Natural Heritage System



Source: City of Hamilton. (2012). Rural Hamilton Official Plan

Rural natural heritage policies are consistent between the Urban and Rural OP.

### 2.2.3 PROPOSED AND FUTURE LAND USE

There are no current Secondary Plans outlining future land use within the Dundas Urban area.

Greenville, to the north west of the Study Area is subject to the special conditions in the Greenville Rural Settlement Plan Area. To maintain and protect the distinct form and historical character of Rural Settlement Areas, proponents shall seek to conserve cultural heritage, resources, cultural heritage landscapes and the overall settlement character.

Population projections for Ward 13 are expected to remain constant, with little growth through to 2031 per the land use population model based on the Growth Related Integrated Development Strategy (GRIDS, 2006) growth projection model.

### 2.2.4 DEMOGRAPHIC PROFILE

According to Statistics Canada 2011 census, the population of Dundas was 24,905 residents, which was 4.8% of the City of Hamilton's total population of 519,950. Compared to Hamilton, Dundas has a slightly higher proportion of seniors (Table 2-6).

Table 2-6 Population by Age Group

	Ward 13				Hamilton			
	2006	2006%	2011	2011%	2006	2006%	2011	2011%
Total population	24,695	100.0%	24,905	100.0%	504,560	100.0%	519,950	100.0%
0 to 4 years	1,085	4.4%	1,035	4.2%	26,940	5.3%	27,430	5.3%
5 to 9 years	1,335	5.4%	1,210	4.9%	29,410	5.8%	27,995	5.4%
10 to 14 years	1,645	6.7%	1,400	5.6%	33,530	6.6%	30,295	5.8%
15 to 19 years	1,705	6.9%	1,700	6.8%	34,910	6.9%	36,200	7.0%
20 to 24 years	1,440	5.8%	1,425	5.7%	34,395	6.8%	36,370	7.0%
25 to 29 years	1,090	4.4%	1,100	4.4%	30,330	6.0%	33,195	6.4%
30 to 34 years	1,145	4.6%	1,020	4.1%	30,620	6.1%	30,905	5.9%
35 to 39 years	1,545	6.3%	1,275	5.1%	34,775	6.9%	31,365	6.0%
40 to 44 years	1,990	8.1%	1,555	6.2%	41,225	8.2%	35,610	6.8%
45 to 49 years	2,060	8.3%	2,050	8.2%	40,845	8.1%	41,890	8.1%
50 to 54 years	1,940	7.9%	2,045	8.2%	36,125	7.2%	40,875	7.9%
55 to 59 years	1,765	7.1%	1,955	7.8%	31,860	6.3%	35,425	6.8%
60 to 64 years	1,385	5.6%	1,770	7.1%	24,220	4.8%	30,810	5.9%
65 to 69 years	1,050	4.3%	1,360	5.5%	19,735	3.9%	22,930	4.4%
70 to 74 years	1,000	4.0%	1,065	4.3%	17,870	3.5%	18,450	3.5%
75 to 79 years	975	3.9%	975	3.9%	16,200	3.2%	15,675	3.0%
80 to 84 years	830	3.4%	910	3.7%	12,620	2.5%	12,630	2.4%
85 years and over	720	2.9%	1,050	4.2%	8,975	1.8%	11,880	2.3%

Source: City of Hamilton. City of Hamilton Ward Profiles Ward Thirteen

Between 2006 and 2011, Dundas has seen an increase in the population aged 55 years and older, and a decrease in the population under 19 years of age.

## 2.2.5 ECONOMIC PROFILE

Similar to Hamilton, the most common occupation of residents in Ward 13 is sales and service. However, the proportion of Ward 13 residents employed in occupations in education, law and social, community and government services is higher than in Hamilton (Table 2-7).

Compared to Hamilton, Ward 13 has a higher proportion of households with an income over \$100,000. Further, in 2011 the average household income for Ward 13 was \$99,141 compared to \$76,742 for Hamilton (Table 2-8).

**Table 2-7 Labour Force by Occupation**

	Ward 13		Hamilton	
	2011	2011 % Total	2011	2011 % Total
<b>Total labour force population aged 15 years and over by occupation - National Occupational Classification (NOC) 2011</b>	<b>12,675</b>	<b>100.0%</b>	<b>266,200</b>	<b>100.0%</b>
All occupations	12,290	97.0%	258,885	97.3%
Management	1,510	11.9%	25,455	9.6%
Business, finance and administration	1,690	13.3%	39,355	14.8%
Natural and applied sciences and related	890	7.0%	14,675	5.5%
Health	1,220	9.6%	19,565	7.3%
Education, law and social, community and government services	2,205	17.4%	33,110	12.4%
Art, culture, recreation and sport	495	3.9%	6,695	2.5%
Sales and service	2,465	19.4%	62,855	23.6%
Trades, transport and equipment operators and related	1,265	10.0%	38,255	14.4%
Natural resources, agriculture and related production	240	1.9%	4,090	1.5%
Manufacturing and utilities	310	2.4%	14,835	5.6%
Occupation - Not applicable	390	3.1%	7,315	2.7%

Source: City of Hamilton. City of Hamilton Ward Profiles Ward Thirteen.

Table 2-8 Household Income 2011

	Ward 13		Hamilton	
	2011	2011 % Total	2011	2011 % Total
Household total income in 2010 of private households	9,895	100.0%	203,805	100.0%
Under \$5,000	130	1.3%	5,100	2.5%
\$5,000 to \$9,999	90	0.9%	3,645	1.8%
\$10,000 to \$14,999	270	2.7%	7,810	3.8%
\$15,000 to \$19,999	300	3.0%	10,875	5.3%
\$20,000 to \$29,999	835	8.4%	19,685	9.7%
\$30,000 to \$39,999	585	5.9%	19,115	9.4%
\$40,000 to \$49,999	785	7.9%	18,850	9.2%
\$50,000 to \$59,999	680	6.9%	16,380	8.0%
\$60,000 to \$79,999	1,465	14.8%	27,605	13.5%
\$80,000 to \$99,999	1,070	10.8%	22,785	11.2%
\$100,000 to \$124,999	1,135	11.5%	19,125	9.4%
\$125,000 to \$149,999	840	8.5%	12,565	6.2%
\$150,000 and over	1,705	17.2%	20,280	10.0%
Average household total income \$	\$99,141		\$76,742	

Source: City of Hamilton. City of Hamilton Ward Profiles Ward Thirteen

## 2.3 CULTURAL ENVIRONMENT

WSP performed a review of the Stage 1 Archaeological Background Study, 95m south of Hillcrest Avenue to Bond Street and Stage 2 Assessment Park Avenue to Bond Street prepared by Historic Horizon in June 2016 as it relates to the overall cultural heritage value of the structure and landscape. A summary of report findings is provided below.

### 2.3.1 SUMMARY OF STAGE 1 AND STAGE 2 ARCHEOLOGICAL ASSESSMENT

A Stages 1 and 2 Archeological Assessment report was prepared by Historic Horizon Inc. for review by the Ministry of Tourism, Culture and Sport (MTCS) and the City of Hamilton. It should be noted that the Stages 1 and 2 archeological assessments completed cover a significantly larger area than the King Street West Bridge EA Study Area. The Stages 1 and 2 report documents the findings and

recommendations of the Stage 1 background study and Stage 2 field assessment. Fieldwork was carried out in November and December 2015.

The Stage 2 assessment by shovel test pits, from Park Avenue to Bond Street, was carried out on both sides of the roadway in all available and undisturbed locations in the ROW, as well as the area of potential road realignment in Fisher's Mill Park. The Stage 2 assessment confirmed that most of it has been deemed to contain nothing having Cultural Heritage Value or Interest (CHVI). Those areas found to have no CHVI, where no artifacts or sites were found, are recommended for no further work.

There were, however, several areas of exception which are listed in the Stage 2 report. For the potential King Street West road realignment that was considered in the Fisher's Mill Park area, the study recommended Stage 3 Testing in order to determine the level of cultural heritage value and significance of any deposits and/or features related to the 19th century development of the Fisher's Mill complex and surrounding neighbourhood, as well as the potential for intact significant Aboriginal artifacts and camp-site(s). As well, further Stage 2 Testing was recommended for the areas adjacent to King Street West on the north side of the road.

The westernmost structure adjacent to the creek, and to the west of the Fisher's Mill Park's boundaries, is recommended for archaeological monitoring during construction activities.

In general, for Fisher's Mill Park and the ROW between Bond Street and Spencer's Creek further Stage 3 historical background research including assessment rolls, business directories, census returns, and any other relevant historical documentation is recommended prior to conducting Stage 3 testing.

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### 2.3.2 HERITAGE IMPACT ASSESSMENT

#### PREVIOUS ASSESSMENT - CULTURAL HERITAGE EVALUATION REPORT (STANTEC, 2017)

In 2017, Stantec completed a Cultural Heritage Evaluation Report (CHER) for King Street West Bridge. The bridge was evaluated against O. Reg. 9/06 and the Hamilton Bridge Guideline. The bridge was found to have CHVI under O. Reg. 9/06 and have moderate heritage value as a Class C structure as per the Hamilton Bridge Guideline. The scoring from the Hamilton Bridge Guideline relates to the 1930 build date (12), use of concrete (8), unusual connection to the surrounding context (10), remnants of the Gore Paper Mill (3), and historical associations (13).

The CHER completed for the structure (Stantec 2017) indicated that the structure will require a Heritage Impact Assessment (HIA) in the event that removal and/or modifications are proposed for this structure and that, specifically, an HIA must be completed when changes are anticipated to the heritage attributes identified for the bridge, which include:

- The original board formed concrete abutments



- Concrete sluiceway
- Remnants of the Gore Paper Mill, including but not limited to:
  - Low stone walls
  - Stone channel (former mill race)
  - Ruins associated with the Gore Paper Mill located on the northwest side of the bridge

Also notable is the following statement (Stantec 2017):

- In addition to consideration of heritage attributes of the King Street West Bridge, the presence of a protected property adjacent to the bridge should be considered in determining the need for an HIA. Immediately adjacent to the bridge site is 397 King Street West, a property included on the City of Hamilton's Register of Cultural Heritage Value or Interest as a listed (non-designated) heritage property. Where a change is proposed to 397 King Street West as part of the proposed undertaking associated with the King Street West Bridge, the effects of that change should be assessed in an HIA.

## STUDY AREA SPECIFIC HISTORY AND DESCRIPTION OF PROPERTY

As part of this King Street West Bridge Municipal Class EA study a HIA was completed (see Appendix C). The City is not intending to impact the remnants of the Gore Paper Mill. As such, those elements and lands are excluded from this study and must be addressed as a separate HIA.

As a contributory document to the EA process, this report relies on contemporary studies completed as components of this EA, in addition to follow up research. The history of the area has been well researched and documented by Jacqueline Fisher (Historic Horizon 2016) in the archaeological assessment report. The report notes the following:

- Flamborough Township was initially divided into 200 acre farm lots laid out in Concession rows. The Study Area is located on parts of Lots 10 to 13, Concession 1 and Lots 9 & 10, Concession 2 of West Flamborough (Illustrated Historical Atlas of Wentworth County, 1875; Figure 6). Concession 1 straddles the Niagara Escarpment and includes a portion of the town of Dundas (amalgamated with Hamilton in 2001), as well as a small area that remained part of West Flamborough until recent municipal amalgamations.
- At the beginning of the 19th century, Dundas grew around the Dundas Mills on lower Spencer Creek, and several early settlers recognized the potential for industry using the water power of the stream.
- Early mills were built along the creek both above and below the Escarpment. Dundas (initially called Cootes Paradise) was officially named in 1814 and incorporated as a town by 1847. Subdivision in the Study Area was well underway in the 1830s as the town grew (Abstracts to Deeds, West

Flamborough). Several radiating roads were built to connect Dundas to Waterloo (now Highway 8), Guelph and York (Toronto). Over the next couple of decades, nearby Hamilton began to develop, and the Great Western Railway was built (early 1850s), causing business to develop quickly in the wider region. Dundas, however, continued to attract industry and business to the area.

- Smith's 1846 Gazetteer lists industry on Spencer Creek as including four grist mills, seven saw mills, a carding machine and fulling mill, oil mill, cloth factory, factory making pumps and furniture, fanning mill, chair factory, paper mill, two tanneries, two machinery factories, a millstone factory, a planing mill, a comb factory, a soap and candle factory, two wagon makers, three breweries, and two distilleries. Many of these would have been located in the community of Dundas (Smith 1846:59).

The structure is not currently registered or designated. It is adjacent to known heritage properties.

The original structure was likely constructed around 1930 under Contract 26-139 and consisted of a single span cast-in-place reinforced concrete T-beam bridge. The structure spans 10.06 m and is 10.74 m wide with six T-beams (girders) and a curb to curb width of 7.32 - 7.52 m. The deck thickness is 216 mm between the T-beams. The abutments and wing walls are constructed of mass concrete gravity retaining walls. The bridge carries two lanes of north south traffic over Spencer Creek.

In 2004 the bridge underwent rehabilitation under Contract PW-03-20 (H) which included replacement of the exterior girders, barriers, sidewalk, top of wing walls, bearing pads, abutment diaphragms and the deck between the easternmost and westernmost girders, as well as rehabilitation to interior girders, bearing seats and new asphalt.

The City of Hamilton Bridge Master Plan Heritage Bridge Inventory Review (Stantec 2015) notes the following:

- The bridge carries King Street West over Spencer Creek at the former site of Fisher's Mill in operation from 1863 until 1930. Mill ruins are evident north of the site adjacent to Dundas Falls situated immediately north of the bridge. The bridge is a replacement of an earlier structure.

Investigations show that the abutments are concrete and the girders (beams) are prestressed concrete. The original structure is also located to the west of the current bridge.

In addition, the structure spans over a man-made channel with a sluice weir located directly west of the structure and a spillway to the east.

### STATEMENT OF CULTURAL HERITAGE VALUE OR INTEREST

The Cultural Heritage Evaluation Report, King Street West Bridge Site 248 (Stantec 2017) notes the following:

- The King Street West Bridge is a Beam/Girder bridge with Rectangular Beams/Girders. It was built in 1930 and is the earliest Beam/Girder Bridge with Rectangular Beams/Girders in the City of Hamilton. This bridge was extensively rehabilitated and only the board formed concrete abutments remain of the original bridge.
- While the bridge itself has been modified, the contextual setting has remained remarkably intact since 1930. Specifically, the original bridge drawings demonstrate that the bridge was designed to connect to the low stone walls and stone channel (a former mill race) built for the Gore Paper Mill. The low stone walls, stone channel, and sluiceway depicted in the original bridge drawings remain in situ and have not been disturbed by either the original construction or subsequent rehabilitation of the King Street West Bridge. The original drawing specify that the exact angles of the wing walls were to be determined on site so that the stone walls and buttresses could be retained. In this way, the bridge was designed with the purpose of preserving the features of the mill.
- The King Street West Bridge was constructed after the Gore Paper Mill was demolished and the Dundas District High School was built. It was constructed to replace the original bridge that carried King Street West over Spencer Creek. The King Street West Bridge itself does not have any known associations with a theme that is significant to the community of Dundas or City of Hamilton but the landscape setting of the bridge is historically associated with the Gore Paper Mill and the Fisher family. The Gore Paper Mill was in operation during the late 19th and early 20th centuries. Spencer Creek was channelized to form a mill race for the Gore Paper Mill by the beginning of the 20th Century. While the mill was demolished in the late 1920s, the ruins of the mill and the stone channel (former mill race) remain in place.
- In addition to the historical association with the former mill, the King Street West bridge is also historically associated with R.M. Smith, who was the Chief Engineer for the bridge. R.M. Smith was the last Deputy Minister for the Ontario Department of Public Highways (from 1928 to 1931) and the first Deputy Minister for the Ontario Department of Highways (from 1931-1943).
- The King Street West Bridge itself does not define, maintain, or support the character of the area but the contextual setting of the bridge, including the low stone walls, stone channel (former mill race), ruins associated with the Gore Paper Mill, and concrete sluiceway support and maintain the late 19th century and early 20th century character of the area. These landscape features maintain the historical associations of the bridge setting with the history of mill industry along Spencer Creek and communicate this history to the local community.



- WSP largely concurs with the statements made by Stantec in their report for the cultural values of the bridge. However, WSP evaluates the differences between their assessments further below. Most notably for the statement of cultural heritage value, Stantec places a connection to R.M. Smith for the bridge. R.M. Smith is one of the most significant figures for the early design and creation of the highway system in Ontario. However, the connection to this bridge structure is tenuous. The copy of the design provided to WSP has the designer's name cut off in the corner. R.M. Smith and S.L. Squire are the approvers of the design; Smith being the Chief Engineer at the Department of Public Highways in 1926 and Squire as the Deputy Minister. Neither would have had an overly active role in the design of this specific bridge and both would have approved all designs in 1926. Hence, the connection with Smith and Squire could extend to all infrastructure constructed over a number of years in Ontario. Considering the context, WSP does not feel that a strong connection exists between Smith and this bridge structure.

### DESIGN/PHYSICAL VALUE

It is WSP's opinion that the King Street West Bridge does not demonstrate significant design or physical value. Bridge elements are consistent with other structures of its type. The CHER (Stantec 2017) notes the cultural heritage value of the original board formed concrete abutments. However, a review by WSP structural engineer indicates that the use of concrete and formwork in this style was common and would not be considered to have significant historical value.

### CONTEXTUAL VALUE

The King Street West Bridge demonstrates contextual value as it contributes to heritage character of the area. It contributes a sense of place representative of 19th and early 20th century landscapes through its massing and placement within the landscape. The contribution of the bridge to the landscape, and the significance of the historic landscape needs to be more fully studied in a wider study of the adjacent property and potential heritage resources, particularly the Gore Mill.

### HISTORICAL/ASSOCIATIVE VALUE

The King Street West Bridge demonstrates historical or associative values as it has known associations with historic themes or events, namely the Gore Mill complex. Remnants of the Gore Paper Mill, include but not limited to the low stone walls, stone channel (former mill race) and the ruins associated with the Gore Paper Mill located on the northwest side of the structure. A bridge structure was located here and tied to the use of the mill for a considerable portion of the 19th and early 20th century. The current structure post-dates the mill's active period, however, the new bridge is considered to be a minor change in mass and size to the original bridge structure. The 1930 bridge also only impacted its direct footprint, leaving the context and other features associated with the bridge intact.

## EVALUATION AND ANALYSIS

The King Street West Bridge has been determined to have elements of moderate cultural heritage value or interest based on the contextual and associative values outlined in

**Table 2-9.**

CATEGORY	CRITERIA	COMMENTS
<i>Design/ Physical Value</i>	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	No
	Displays a high degree of craftsmanship or artistic merit	No
	Demonstrates a high degree of technical or scientific achievement	No
<i>Contextual Value</i>	Is important in defining, maintaining or supporting the character of an area	Yes
	Is physically, functionally, visually or historically linked to its surroundings	Yes
	Is a landmark	No
<i>Historical/ Associative Value</i>	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community	Yes
	Yields, or has the potential to yield, information that contributes to an understanding of a community or culture	No
	Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community	No

Table 2-9 Ontario Regulation 9/06 Evaluation – King Street West Bridge

CATEGORY	CRITERIA	COMMENTS
<i>Design/ Physical Value</i>	Is a rare, unique, representative or early example of a style, type, expression, material or construction method	No
	Displays a high degree of craftsmanship or artistic merit	No
	Demonstrates a high degree of technical or scientific achievement	No
<i>Contextual Value</i>	Is important in defining, maintaining or supporting the character of an area	Yes
	Is physically, functionally, visually or historically linked to its surroundings	Yes
	Is a landmark	No
<i>Historical/ Associative Value</i>	Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community	Yes
	Yields, or has the potential to yield, information that contributes to an understanding of a community or culture	No
	Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community	No

## IMPACT

The King Street West Bridge was determined to possess moderate cultural heritage value or interest based on Contextual Value and Historical/Associative Value. The proposed undertaking has the potential to negatively impact cultural heritage values should the structure be removed (without replacement) or relocated to a non-adjacent space. The following examines the impacts based on the alternative solutions proposed.

When determining the potential impacts of a project on a heritage resource it is important to review the heritage attributes of that resource and determine if the

nature of the project will cause impacts to its heritage attributes (Parks Canada 2010:3). As this study, and the CHER were only conducted on Bridge 248 and did not review the landscape and properties adjacent to the structure, no determination of the impacts to resources other than the bridge can confidently be made.

Of note for the replacement of this bridge structure is the presence of the remnants of the Gore Mill adjacent to and north of the bridge structure; which from preliminary review would appear to have potential to be considered a heritage resource. As no heritage attributes have been defined for the mill through a detailed study and community consultation, this assessment is taking a zero-impact approach to the physical remnants of the mill structure. Visual and contextual impacts to the mill will be recommended based on a minimal intervention and impact goal.

## MITIGATION

The review of the alternative options proposed against the heritage attributes of the bridge structure results in initial recommendation of Alternative 2 – Rehabilitation of the current structure. The rehabilitation of the structure would cause the lowest impact to the heritage attributes by keeping the existing massing and likely result in the least impact to the physical mill remnants.

Alternative 3, if done appropriately, is of equal standing with Alternative 2 for impacts to the heritage attributes of the bridge. The key factors for an appropriate replacement structure would be the retention of all physical assets of the mill, including those within the embankments of the current bridge structure and the maintaining of the massing of the current bridge while conforming the new bridge to current design standards. Should both of those objectives be achievable by a replacement for the bridge, then the impact of Alternative 3 would be equivalent to Alternative 2.

If the decision is made proceed with Alternative 2, 3 or 4, it is recommended that the City undertake full recording and documentation of the existing structure in situ prior to rehabilitation or removal.

Where a change is proposed to either the Remnants of the Gore Paper Mill (including but not limited to the low stone walls, stone channel (former mill race), and ruins associated with the Gore Paper Mill located on the northwest side of the bridge) or to heritage property designated as 397 King Street West, the effects of that change should be assessed in an HIA.

## RECOMMENDATIONS

Based on the results of research, site investigation, and application of the criteria from Ontario Regulation 9/06, the King Street West Bridge was determined to have elements of moderate cultural heritage value or interest based on the contextual and associative values, but not design/physical value.

Based on the evaluation of the structure in conjunction with the feedback from the public, Alternative 3 (Replacement of the Bridge at the existing location) is the most preferred option. Maintaining an association with this location with the construction a new bridge of similar massing and minimally impacting the mill remnants will satisfy the heritage concerns.

Based on the conclusions of this study the following recommendations are made:

- A bridge design be implemented that conforms to the current design standards and addresses the needs of transportation at this location while maintaining the overall massing of the existing bridge.
- It is recommended that the City undertake full recording and documentation of the existing structure in situ prior to removal of the existing bridge structure
- It is recommended that all elements related to the Remnants of the Gore Paper Mill be protected from impacts associated with the removal of the existing structure and the placement of the new bridge.
- Where a change is proposed to either the Remnants of the Gore Paper Mill (including but not limited to the low stone walls, stone channel (former mill race), and ruins associated with the Gore Paper Mill located on the northwest side of the bridge) or to heritage property designated as 397 King Street West, the effects of that change should be assessed in an HIA.

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## 2.4 TRANSPORTATION NETWORK

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### 2.4.1 EXISTING ROAD NETWORK

King Street West/Highway 8 is a 2-lane roadway under the jurisdiction of the City of Hamilton. King Street West/Highway 8 runs east-west within the Study Area and connects the communities of Greensville and Dundas. There is a grade-separated rail crossing approximately 330m west of the bridge with a vertical clearance of 4.0m. There are no signalized intersections along King Street West/Highway 8

within the Study Area. The posted speed limit is 50 km/h and there are advisory speed limit signs before the bridge (30 km/h).

The King Street West Bridge carries two lanes of north-south traffic and has a width of 7.32 to 7.52m (curb to curb). The bridge has a 2.5m sidewalk on the east side. King Street West/Highway 8 has an urban cross section east of the King Street West Bridge and a rural cross section west of the bridge.

There are two intersections within the Study Area, both are two-way stop control with the right-of-way assigned to King Street/Highway 8:

- Woodleys Lane: is a skewed “T” intersection and Woodleys Lane serves as an access to the Dundas Valley Golf and Curling Club. The eastbound approach from King Street/Highway 8 has a “Hidden Intersection” sign approximately 150m before the intersection with Woodleys Lane.
- Bond Street: is a four-leg intersection in a residential area with no dedicated lanes for turning movements. There is a bus stop on the southeast corner which is served by Hamilton Street Railway (HSR) Route 5 – Delaware.

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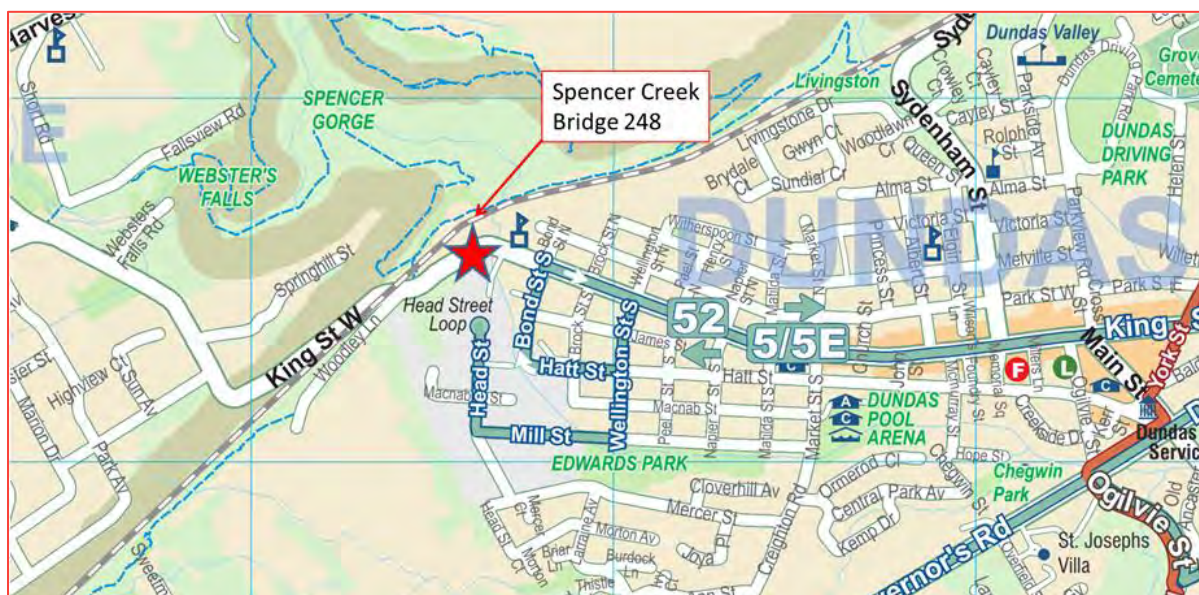
#### 2.4.2 TRANSIT SERVICES

Hamilton’s Transportation Master Plan (2007) summarizes transit services under existing conditions and provides high level recommendations for implementation.

HSR Transit route No. 5 – Delaware serves the residential area and has a stop at the corner of King Street West and Bond Street. Bus service is provided Monday to Sunday approximately every 30 minutes at this stop. Figure 2-8 describes transit service in the Study Area.



Figure 2-8 Transit Service in Study Area



Source: HSR System Map – September 2016

### 2.4.3 ACTIVE TRANSPORTATION

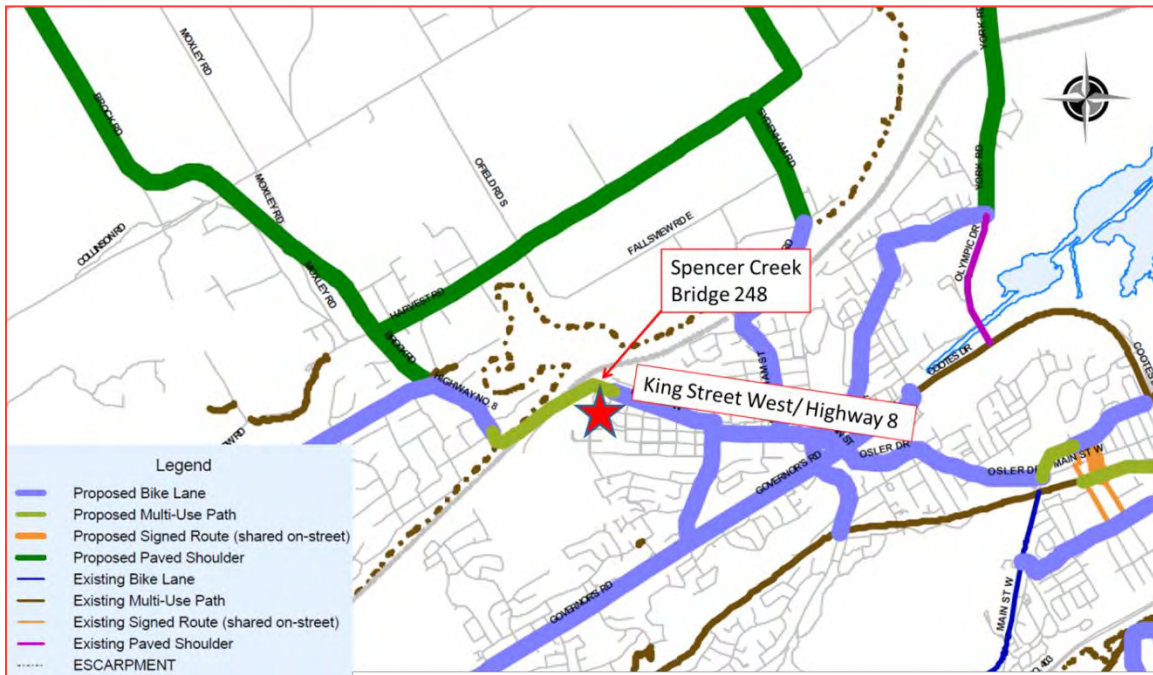
Hamilton's Cycling Master Plan (2009) establishes priorities for implementation of cycling facilities within the City. The Plan proposes a multi-use path on the section of King Street West/ Highway 8 west of bridge. On east side of the King Street West Bridge, the Plan proposes a bike lane. Figure 2-9 illustrates the preferred cycling network as proposed by the Cycling Master Plan. The Cycling Master Plan is undergoing a review and update as part of the TMP review and update.

Hamilton's Transportation Master Plan (2007) proposed an on-street bike lane on a 1.7 km section of King Street West/ Highway 8 from Bond Street to Brock Road, with King Street West Bridge being included in this section. In terms of timing, this on-street infrastructure facility was proposed for medium-term (2012 to 2016).

The Recreational Trails Master Plan (2016) identifies this location as area with accommodation and linkage for active transportation modes.

It is expected that the new bridge will provide accommodation for cyclists and pedestrians in order to promote active modes of transportation.

Figure 2-9 Preferred Cycling Network from Cycling Master Plan (2009)



Source: Hamilton's Cycling Master Plan (2009) – Appendix B – Preferred Cycling Network Map

#### 2.4.4 EXISTING TRAFFIC VOLUMES

##### EXISTING LINK/ MIDBLOCK VOLUMES

Based on the City of Hamilton's traffic count program, Annual Average Daily Traffic (AADT) on King Street West/Highway 8 was approximately 9,300 vehicles per day in 2013. The City also provided midblock traffic counts at the King Street West Bridge (carried out on October 5, 2016). Table 2-10 summarizes historic AADT data.

Table 2-10 Historic AADT on King Street West/Highway 8 within Study Area

Year	EB Count (vehicles)	WB Count (vehicles)	Total AADT (vehicles)
2013	4,644	4,656	9,300
2016	4,358	4,386	8,744

After reviewing previous traffic count data, very little variation in link volume was observed during the last three years.



In terms of link/midblock capacity analysis within King Street/Highway 8, a maximum link capacity of 880 vehicles per hour per lane is typically assumed. Volumes higher than 792 vehicles per hour per lane will indicate the need for additional link capacity as the volume-to-capacity (V/C) ratio will be greater than 0.90. Table 2-11 shows existing peak direction link volumes and V/C ratios based on 2016 traffic counts.

**Table 2-11 2016 Existing Conditions Link Capacity Analysis on King Street/ Highway 8 between Bond Street and Woodleys Lane**

Peak Hour	Hourly Volume (peak direction)	V/C
7:45 AM – 8:45 AM	428 (EB)	0.49
4:30 PM – 5:30 PM	384 (WB)	0.44

Based on these link V/C ratios, currently there is no need to widen King Street/Highway 8 within the Study Area. See Appendix D for details.

### EXISTING TRAFFIC OPERATIONS

WSP performed capacity analysis for the indicated intersections by using Highway Capacity Manual (HCM) Methodology and Synchro 8.0 software. Traffic operations analysis was based on Synchro Modelling requirements from the City of Hamilton Traffic Impact Study Guidelines (July 2009). This analysis is based on existing lane configurations and takes into consideration a peak hour factor of 0.92 and heavy vehicle percentages from the actual traffic counts. Table 2-12 provides a summary of intersection level of service (LOS) and V/C ratios.

**Table 2-12 Existing Intersection Capacity Analyses**

Intersection	AM Peak Hour			PM Peak Hour		
Movement	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
<b>King Street West and Woodleys Lane</b>						
Eastbound Through/Right	0.26	0	A	0.25	0	A
Westbound Through/Left	0.02	1	A	0.01	0	A
Northbound Left/Right	0.00	0	A	0.05	12	B
<b>King Street West and Bond Street</b>						
Eastbound Left/Through/Right	0.00	0	A	0.01	0	A
Westbound Left/Through/Right	0.00	0	A	0.01	0	A
Northbound Left/Through/Right	0.06	15	B	0.05	15	B

Intersection	AM Peak Hour			PM Peak Hour		
Movement	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
Southbound Left/Through/Right	0.04	14	B	0.04	13	B

Results of the capacity analyses for existing conditions indicate that all intersection movements are operating at good levels of service and delay during the weekday AM and PM peak hours, as shown in the above table.

### GROWTH RATES

WSP reviewed two sources of information in order to estimate future year traffic on King Street West/Highway 8:

- historic traffic volumes
- City of Hamilton Travel Demand Model (EMME model – volume plots within Study Area)

As indicated in Section above (Table 2-10), historic AADT volumes indicate a slight decrease during the 2013 to 2016 time period.

Furthermore, the City's Travel Demand Model plots for the King Street West Bridge location provided volume information for years 2011 and 2031 as described in Table 2-13.

**Table 2-13 Link Volumes from Hamilton Travel Demand Model**

Year	Link Flow (vehicles)		
	EB	WB	Total
2011	343	505	848
2031	685	330	1,015

The above table indicates a forecasted average growth rate of approximately 0.9 percent per year for both directions.

According to information provided by the City of Hamilton, population growth in the Study Area is estimated at approximately 1.0 percent per year.

A growth rate of 1.0 percent per annum was assumed for King Street West/ Highway 8 and Bond Street. No growth rate was applied to turning movements associated with Woodleys Lane since this road serves primarily the Dundas Valley Golf and Curling Club, which is a facility that is not expected to generate additional traffic growth in the foreseeable future.

## REVIEW OF COLLISION DATA

WSP conducted a review of existing conditions within the Study Area including the last five years of collision history (October 2011 to October 2016). Collision data was extracted from the City's collision database by the City staff and provided to WSP on November 21, 2016.

Seventeen collisions occurred during the last five years within the Study Area. Four of the collisions were intersection-related, with three collisions occurring at the intersection of King Street West at Woodleys Lane. These collisions may have occurred due to an 'unconventional' intersection configuration and could be avoided by the provision of a better alignment and sight distance.

Rain and road alignment (either curve on hill or curve on level) might be a factor in approximately 47 percent of collisions (8 out of 17). In four of those events, the driver lost control of the vehicle and it skidded/sled.

## FUTURE (2026) TRAFFIC

The horizon year for future traffic analysis is 2026 (ten years from existing conditions). Future (2026) traffic for the study horizon was calculated by applying a 1.0 percent annual growth rate over ten years to the existing volumes. Table 2-14 shows a comparison of existing and future volumes along with their respective volume-over-capacity ratios.

**Table 2-14 Comparison of Current (2016) and Future (2026) Link Capacity on King Street West/ Highway 8 between Bond Street and Woodleys Lane**

Peak Hour	Hourly Volume (peak direction)		V/C	
Year	2016	2026	2016	2026
7:45 AM – 8:45 AM	428 (EB)	473 (EB)	0.49	0.54
4:30 PM – 5:30 PM	384 (WB)	424 (WB)	0.44	0.48

Based on these link V/C ratios, there is no need to widen King Street West/Highway 8 within the Study Area for the following ten years.

Intersection capacity analyses for the future (2026) horizon traffic conditions were completed for the two Study Area intersections to determine LOS and V/C ratios during the AM and PM peak hours. Intersection operations were analyzed using HCM methodology and Synchro 8.0 software. Table 2-15 provides a summary of intersection operation metrics under future (2026) traffic conditions.

**Table 2-15 Future (2026) Intersection Traffic Operations**

Intersection	AM Peak Hour			PM Peak Hour		
Movement	V/C	Delay (sec.)	LOS	V/C	Delay (sec.)	LOS
<b>King Street West and Woodleys Lane</b>						
Eastbound Through/Right	0.29	0	A	0.28	0	A
Westbound Through/Left	0.02	1	A	0.01	0	A
Northbound Left/Right	0.00	0	A	0.06	13	B
<b>King Street West and Bond Street</b>						
Eastbound Left/Through/Right	0.00	0	A	0.01	0	A
Westbound Left/Through/Right	0.00	0	A	0.01	0	A
Northbound Left/Through/Right	0.07	16	C	0.07	16	C
Southbound Left/Through/Right	0.05	15	B	0.06	15	B

Results of the capacity analyses for future (2026) conditions indicate that all intersection movements will operate at good levels of service and delay during the weekday AM and PM peak hours, as shown in the Table above. Furthermore, there will not be deterioration of traffic conditions at the study intersections with the projected traffic growth.

## SUMMARY

The Traffic analysis associated with the Traffic Report for the King Street West Bridge Municipal Class EA is summarized as follows:

- Based on observed V/C ratios, currently there is no need for widening of King Street West/Highway 8 within the Study Area.
- Based on projected V/C ratios, there is no need for widening of King Street West/Highway 8 within the Study Area for the following ten years.
- Results of the intersection capacity analyses for existing and future (2026) conditions indicate that all intersection movements are operating at good levels of service and delay during the weekday AM and PM peak hours.
- There are current and planned AT facilities within the Study Area, therefore the new King Street West Bridge should provide accommodation for bicyclists and pedestrians in order to promote active modes of transportation.

- Seventeen collisions occurred during the last five years within the Study Area. Four of the collisions were intersection-related, with three collisions occurring at the intersection of King Street West at Woodleys Lane. These collisions may have occurred due to an 'unconventional' intersection configuration and could be avoided by the provision of a better intersection alignment and sight distance.

## 2.5 STRUCTURAL ASSESSMENT

King Street West Bridge spans over the Spencer Creek which has a sluice weir located directly west of the structure and a spillway to the east and supports a 300 mm diameter insulated watermain below the east sidewalk. A 100 mm diameter gas main is also mounted to the east fascia on steel angles. In addition, there are overhead wires located approximately 2.5 m east of the existing structure.



In 2004, the bridge underwent rehabilitation under Contract PW-03-20 (H), which included replacement of the exterior girders, barriers, sidewalk, top of wingwalls, bearing pads, abutment diaphragms and the deck between the easternmost and westernmost girders, as well as rehabilitation to interior girders, bearing seats and new asphalt. Drawings for the bridge rehabilitation in 2004 (Contract PW-03-20) and original 1926 drawings are available.

The following summarizes the existing condition of King Street West Bridge:

- Deck Soffit - generally in good condition with local spalls and delaminations located above the abutments.
- Concrete Girders - it was noted that the 5th girder from the west has been patched along almost the full length. In addition, there are several locations

where the soffits of the girders have delaminated and longitudinal cracks are apparent along the beam. In particular, the 2nd girder from the west shows cracking almost along the entire length, while the 3rd and 4th girder from the west have cracks concentrated on the south ends. It is noted that longitudinal cracking along the bottom of the girder suggests that the underside may be delaminated; however based on sounding it has not been recorded as such.

- Abutments - the north and south abutments have severe deterioration, delaminations, spalls and medium to wide vertical cracks along the centre of the bridge.
- Wingwalls - the east wingwalls are not visible for inspection however the west wingwalls have severe deterioration, delaminations, spalls and medium to wide cracks.



- Asphalt - generally in fair condition with patched areas along each curb, unsealed transverse cracks beyond the structure and a longitudinal crack along the centreline of road.
- 2003 rehabilitation drawings show restored asphalt surface consisting of 50 mm HL8, 40 mm of HL3 and waterproofing; however, the existing asphalt conditions suggest the wearing surface was not completed over the entire deck.
- Waterproofing - the 2010 OBMS documents that the bridge does not have waterproofing.



- Concrete Parapet - concrete parapet walls were replaced as part of the 2004 rehabilitation and are in good condition.
- Sidewalk - the sidewalk surface is in good condition; however, the vertical height from the top of asphalt appears to be less than the standard minimum “barrier curb” height of 150 mm.
- Guide Rail - located in the northwest, northeast and southwest quadrants of the bridge are generally in fair condition with signs of impact damage on the southwest quadrant. The guide rails do not meet current standards in terms of length, end treatment and post spacing. There is a masonry wall in the southeast quadrant which does not meet current standards for roadside barriers.
- Adjacent Retaining Walls - the base of the northeast retaining wall shows signs of section loss, the adjacent masonry gravity retaining wall located near the northwest approach show signs of section loss and deterioration.



## 3 ALTERNATIVE SOLUTIONS

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### 3.1 IDENTIFICATION AND DESCRIPTION OF THE ALTERNATIVE SOLUTIONS

The main focus of Phases 1 and 2 of the Class EA process is the identification and evaluation of various solutions to the problem(s). The Class EA process recognizes that there are many ways of solving a particular problem and requires various alternative solutions to be considered. A possible alternative solution to address the problem and opportunity statement would be to replace the King Street West Bridge, which would maintain traffic safety and operations on the bridge.

Alternative solutions are developed to address the problem and opportunity statement with a specific focus on improving structural integrity of the subject bridge and minimizing impact to safety and traffic operations on King Street West. In addition to the “Do Nothing” alternative, specific alternatives were developed based on other possibilities than bridge replacement.

Rehabilitating the existing bridge and replacing the bridge were both considered, as well as removing the existing bridge and constructing a new bridge downstream and realigning King Street West.

The following outlines the process that was followed to review and evaluate potential solutions. A full range of alternative solutions as described below were identified and compared to the “Do Nothing” (base case) alternative.

The Class EA planning process requires that various reasonable and feasible solutions to the identified problem be examined. A matrix format was used to show how each alternative rate on each screening criterion to compare alternative solutions.

1. **The “Do Nothing” Alternative** - This alternative provides a base to which the other alternatives can be compared. Under this alternative, no measures to improve the condition of the bridge are considered (status quo);
2. **Rehabilitate Existing Bridge** – Repair and rehabilitate the existing bridge to address the structural deficiencies;
3. **Replace Bridge at existing location** – Replace existing bridge with new bridge that complies with current design standards (including the provision of active transportation); and
4. **Replace and Realign Bridge and King Street West** – Remove the existing bridge and construct a new bridge downstream and realign King Street West.



## 3.2 ANALYSIS AND EVALUATION OF ALTERNATIVE SOLUTIONS

### 3.2.1 EVALUATION CRITERIA

As presented in Table 3-1, evaluation criteria were used to evaluate the alternatives. The Table includes technical considerations and environmental components that address the broad definition of the environment as described in the Environmental Assessment Act (EA Act).

A detailed assessment of each alternative is completed based on the described evaluation components. A descriptive qualitative evaluation is also used to consider the suitability and feasibility of alternative solutions and design concepts. Trade-offs considering the advantages or disadvantages of each alternative to address the problem and opportunity statement with the least environmental effects and the most technical benefits formed the rationale for the identification of the preferred solution.

**Table 3-1 Evaluation Criteria**






Component	Evaluation Criteria
Transportation	<ul style="list-style-type: none"> <li>- <b>Traffic Operations and Accommodation of Future Travel Demand</b> <ul style="list-style-type: none"> <li>- Potential to accommodate long-term vehicular travel demands</li> <li>- Potential to serve transit travel demand</li> <li>- Potential to improve Active Transportation in the area (walking, cycling)</li> </ul> </li> <li>- <b>Traffic Operations and Accommodation of Current Travel Demand</b> <ul style="list-style-type: none"> <li>- Potential to accommodate current travel demands during construction phase</li> </ul> </li> <li>- <b>Traffic Safety</b> <ul style="list-style-type: none"> <li>- Potential to improve traffic safety based on the opportunity to reduce congestion and potential for collisions</li> </ul> </li> <li>- <b>Road Network Compatibility/Connectivity</b> <ul style="list-style-type: none"> <li>- Consistency with the proposed transportation system and function of roads in the long term and create an efficient and comprehensive transportation network for the City that contributes to the Regional road network</li> </ul> </li> <li>- <b>Accommodation of Pedestrians/Cyclist</b> <ul style="list-style-type: none"> <li>- Ability to address walking and cycling objectives in the corridor (sidewalks, bike lanes, on-road routes, etc.)</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>- Opportunities for transportation choices other than vehicle use</li> <li>- Address the challenges associated with new growth in the City, and provide a multi-modal vision of sustainable mobility that can accommodate vehicles, transit, cyclists and pedestrians in a healthy community</li> <li>- <b>Response Times/Access for Emergency Vehicles</b> <ul style="list-style-type: none"> <li>- Potential to improve response time/accessibility for emergency vehicles due to changes in travel time</li> </ul> </li> </ul>
Engineering Considerations – Constructability	<ul style="list-style-type: none"> <li>- <b>Services/Utilities</b> <ul style="list-style-type: none"> <li>- Potential impact to services or utilities within the corridor</li> <li>- Accommodation of planned services/utilities</li> </ul> </li> <li>- <b>Construction Staging</b> <ul style="list-style-type: none"> <li>- Impact to existing traffic operations during construction</li> <li>- Impact to current travel demands during construction</li> </ul> </li> <li>- <b>Drainage/Stormwater Management</b> <ul style="list-style-type: none"> <li>- Potential to increase stormwater run-off (water quantity)</li> <li>- Increase in pollutants to receiving watercourses (water quality)</li> </ul> </li> </ul>
Cultural Environment	<ul style="list-style-type: none"> <li>- <b>Archaeological resources</b> <ul style="list-style-type: none"> <li>- Potential to impact archaeological resources (previously undisturbed areas with high potential for recovery of artifacts)</li> </ul> </li> <li>- <b>Built Heritage Resources</b> <ul style="list-style-type: none"> <li>- Potential to impact known built heritage resources (i.e. listed/designated under Part IV or V of the Ontario Heritage Act and/or identified as 'culturally significant' by the Municipality)</li> </ul> </li> </ul>
Social/Economic Environment	<ul style="list-style-type: none"> <li>- <b>Sustainability and City/ Regional Planning</b> <ul style="list-style-type: none"> <li>- Consistency with local and regional planning development objectives and economic growth</li> </ul> </li> <li>- <b>Potential sustainability improvements to the community, including greenhouse gas emissions</b> <ul style="list-style-type: none"> <li>- Improve local sustainability by providing alternative transportation modes in order to reduce auto dependency</li> </ul> </li> <li>- <b>Noise Impacts</b> <ul style="list-style-type: none"> <li>- Potential to increase noise in Noise Sensitive Areas (NSAs) (e.g. residential properties backing onto the roadway)</li> </ul> </li> <li>- <b>Property Impacts</b> <ul style="list-style-type: none"> <li>- Potential impacts to property</li> <li>- Potential impacts to public facilities and recreation areas</li> </ul> </li> </ul>
Natural Environmental	<ul style="list-style-type: none"> <li>- <b>Species at Risk (SAR)</b> <ul style="list-style-type: none"> <li>- Potential to impact ESA regulated area(s)</li> </ul> </li> <li>- <b>Vegetation and wildlife</b></li> </ul>

	<ul style="list-style-type: none"> <li>- Potential impact to natural areas and habitats</li> <li>- Potential to impact vegetation and/or wildlife</li> <li>- <b>Water Resources and Fisheries</b> <ul style="list-style-type: none"> <li>- Potential impact to watercourses and fisheries habitat</li> </ul> </li> <li>- <b>Natural Hazards</b> <ul style="list-style-type: none"> <li>- Potential impact to flooding and erosion</li> </ul> </li> </ul>
Capital Cost/ Implementation	<ul style="list-style-type: none"> <li>- <b>Costs</b> <ul style="list-style-type: none"> <li>- relative cost in terms of capital costs, property costs and maintenance costs</li> </ul> </li> </ul>

### 3.2.2 EVALUATION OF ALTERNATIVE PLANNING SOLUTIONS











The assessment of each alternative against each screening criterion was based on analysis done by specialists on the consulting team. To facilitate comparison of alternatives, ratings were attached to each criterion for each alternative using a two point scale of least preferred and most preferred represented by coloured and non-coloured circles, as shown below.

<b>LEGEND</b>					
	<b>Most Preferred</b>			<b>Least Preferred</b>	





A comparative evaluation in a matrix was prepared and is shown in Table 3-2






Alternative Solutions Evaluation: Transportation Components

Evaluation Criteria and Sub-Factors	PLANNING ALTERNATIVE SOLUTION 1: Do Nothing	PLANNING ALTERNATIVE SOLUTION 2: Rehabilitate Existing Bridge	PLANNING ALTERNATIVE SOLUTION 3: Replace Bridge at Existing Location	PLANNING ALTERNATIVE SOLUTION 4: Replace Existing Bridge and Realign King Street West
TRANSPORTATION	This alternative provides a base to which the other alternatives can be compared. Under this alternative, no measures to improve the condition of the bridge are considered (status quo).	Repair and rehabilitate the existing bridge to address the structural deficiencies.	Replace existing bridge with new bridge that complies with current design standards	Remove the existing bridge and construct a new bridge downstream and realign King Street West
<b>Traffic Operations and Accommodation of Current and Future Travel Demand</b> <ul style="list-style-type: none"><li>Potential to accommodate existing and long-term vehicular travel demands</li><li>Potential to improve Active Transportation in the area (walking, cycling)</li></ul>	<ul style="list-style-type: none"><li>Does not accommodate existing and future multi-modal travel demands and multi-modal connectivity in the study area to support a healthy built environment</li><li>Does not address pedestrian and cyclist requirements</li><li>Potential for disruption to transportation between the communities of Dundas and Greensville in the event that bridge must be closed/ removed.</li></ul>	<ul style="list-style-type: none"><li>Low potential to accommodate future multi-modal travel demands and multi-modal connectivity in the study area to support a healthy built environment</li><li>Does not address pedestrian and cyclist requirements</li><li>Minor disruption to transportation between the communities of Dundas and Greensville during rehabilitation activities</li></ul>	<ul style="list-style-type: none"><li>Will accommodate future multi-modal travel demands and multi-modal connectivity in the study area to support a healthy built environment</li><li>May address pedestrian and cyclist requirements</li><li>Long term, major disruption to transportation between the communities of Dundas and Greensville during construction; the traffic will be detoured and King Street West closed at bridge location during construction of the new bridge.</li></ul>	<ul style="list-style-type: none"><li>Will accommodate future multi-modal travel demands and multi-modal connectivity in the study area to support a healthy built environment</li><li>May address pedestrian and cyclist requirements</li><li>Temporary, minor disruption to transportation between the communities of Dundas and Greensville during construction; the existing bridge will remain open during construction of the new bridge. However, it may result in single-lane traffic and some complete closures at some points during construction/demolition.</li></ul>
<b>Traffic Safety</b> <ul style="list-style-type: none"><li>Potential to improve traffic safety based on the opportunity to improve road geometrics and sightlines</li></ul>	<ul style="list-style-type: none"><li>Will not improve traffic safety and reduce potential for collisions</li><li>Does not meet roadway geometrics and sightline required standards at bridge western approach</li></ul>	<ul style="list-style-type: none"><li>Low potential to improve traffic safety and reduce potential for collisions</li><li>Does not meet roadway geometrics and sightline required standards at bridge western approach</li></ul>	<ul style="list-style-type: none"><li>Moderate potential to improve traffic safety and reduce potential for collisions</li><li>Improved geometrics and sightlines at bridge western approach</li></ul>	<ul style="list-style-type: none"><li>High potential for improvement to the safety of bridge users due to the construction of the new bridge and realignment of Kings Street West</li><li>Improved geometrics and sightlines at bridge western approach</li></ul>
<b>Road Network Compatibility/Connectivity</b> <ul style="list-style-type: none"><li>Consistency with the proposed transportation system and function of roads in the long term, and potential to create an efficient and comprehensive transportation network for the City that contributes to the Regional road network</li></ul>	<ul style="list-style-type: none"><li>Bridge will eventually be required to be removed if it is not rehabilitated which will eventually limit connectivity of the transportation system</li><li>Removing the bridge would directly impact the existing land uses and impact traffic patterns in the area</li><li>Would force vehicular traffic to move on other streets/roads in the area and would interrupt continuity of King Street West/Highway 8 pathway system for pedestrians and cyclists</li><li>Not consistent with City of Hamilton policies for “Transportation Systems” and “Transportation and Infrastructure Corridors”, including maintaining or improving connectivity within and among transportation systems and modes (1.6.5.3)</li></ul>	<ul style="list-style-type: none"><li>Bridge will eventually be required to be replaced which will eventually impact connectivity of the transportation system</li><li>Replacing the bridge would directly impact the existing land uses and impact traffic patterns in the area during construction</li><li>Consistent with or supports the City’s policies for “Transportation Systems” and “Transportation and Infrastructure Corridors”, including maintaining or improving connectivity within and among transportation systems and modes (1.6.5.3), however inconsistent with the active transportation (pedestrian and cyclist) requirements</li></ul>	<ul style="list-style-type: none"><li>Consistent with the City’s policies for “Transportation Systems” and “Transportation and Infrastructure Corridors”, including maintaining or improving connectivity within and among transportation systems and modes (1.6.5.3)</li><li>Potential to improve pedestrian and cyclist connectivity.</li></ul>	<ul style="list-style-type: none"><li>Consistent with the City’s policies for “Transportation Systems” and “Transportation and Infrastructure Corridors”, including maintaining or improving connectivity within and among transportation systems and modes (1.6.5.3)</li><li>Potential to improve pedestrian and cyclist connectivity.</li></ul>
<b>Accommodation of Pedestrians/Cyclists</b> <ul style="list-style-type: none"><li>Ability to address walking and cycling objectives in the corridor (sidewalks, bike lanes, on-road routes, etc.)</li><li>Opportunities for transportation choices other than vehicle use</li><li>Address the challenges associated with new growth in the City, and provide a multi-modal vision of “sustainable mobility” that can accommodate vehicles, transit, cyclists and</li></ul>	<ul style="list-style-type: none"><li>Existing roadway/ bridge does not adequately accommodate pedestrians and/or cyclists in the study area</li><li>No opportunity to incorporate proposed connections/routes in Hamilton’s Recreational Trails Master Plan and Cycling Master Plan</li></ul>	<ul style="list-style-type: none"><li>Existing roadway/ bridge does not adequately accommodate pedestrians and/or cyclists in the study area</li><li>No opportunity to incorporate proposed connections/routes in Hamilton’s Recreational Trails Master Plan and Cycling Master Plan</li></ul>	<ul style="list-style-type: none"><li>Potential to incorporate proposed connections/routes in Hamilton’s Recreational Trails Master Plan and Cycling Master Plan</li><li>High potential to provide improved public facilities (e.g. sidewalks, bike lanes) to encourage and promote alternative modes of transportation (e.g. walking, cycling)</li><li>Provide a multi-modal vision of “sustainable mobility” that can accommodate vehicles, transit, cyclists and pedestrians in a healthy community</li></ul>	<ul style="list-style-type: none"><li>Potential to incorporate proposed routes in Hamilton’s Recreational Trails Master Plan and Cycling Master Plan</li><li>High potential to provide improved public facilities (e.g. sidewalks, bike lanes) to encourage and promote alternative modes of transportation (e.g. walking, cycling)</li><li>Provide a multi-modal vision of “sustainable mobility” that can accommodate vehicles, transit, cyclists and pedestrians in a healthy community</li></ul>

pedestrians in a healthy community						
<b>Response Times/Access for Emergency Vehicles</b> <ul style="list-style-type: none"><li>Potential to improve response time/ accessibility for emergency vehicles due to bridge and road improvement</li></ul>	<ul style="list-style-type: none"><li>Very low potential to improve emergency service response times due to existing poor traffic lanes geometrics and sightlines at bridge western approach</li></ul>	<ul style="list-style-type: none"><li>Very low potential to improve emergency service response times due to existing poor traffic lanes geometrics and sightlines at bridge western approach</li></ul>	<ul style="list-style-type: none"><li>Potential to improve emergency service response times due to improved traffic lanes geometrics at bridge western approach</li><li>Long term, major disruption to transportation between the communities of Dundas and Greenville during construction; the traffic will be detoured and King Street West closed at bridge location during construction of the new bridge.</li></ul>	<ul style="list-style-type: none"><li>Potential to improve emergency service response times due to improved traffic lanes geometrics and sightlines at bridge western approach</li></ul>		
<b>Summary of Transportation Considerations</b>						
<b>LEGEND</b>						
	<b>Most Preferred</b>			<b>Least Preferred</b>		

Alternative Solutions Evaluation: Engineering Considerations and Constructability

Evaluation Criteria and Sub-Factors	PLANNING ALTERNATIVE SOLUTION 1: Do Nothing	PLANNING ALTERNATIVE SOLUTION 2: Rehabilitate Existing Bridge	PLANNING ALTERNATIVE SOLUTION 3: Replace Bridge at Existing Location	PLANNING ALTERNATIVE SOLUTION 4: Replace Existing Bridge and Realign King Street West
ENGINEERING CONSIDERATIONS AND CONSTRUCTABILITY	This alternative provides a base to which the other alternatives can be compared. Under this alternative, no measures to improve the condition of the bridge are considered (status quo).	Repair and rehabilitate the existing bridge to address the structural deficiencies.	Replace existing bridge with new bridge that complies with current design standards	Remove the existing bridge and construct a new bridge downstream and realign King Street West
<b>Bridge Design and Accessibility</b> <ul style="list-style-type: none"><li>Potential to improve safety for bridge users.</li><li>Constructability of proposed infrastructure.</li><li>Potential for future maintenance requirements.</li></ul>	<ul style="list-style-type: none"><li>No design requirements</li><li>No immediate impacts, however the bridge has limited lifespan due to the deterioration of critical elements</li><li>Potential for bridge load posting or to be taken out of service</li><li>May increase vehicular traffic on other streets/roads in the area and will interrupt continuity of King Street West/Highway 8 pathway system for all road users</li></ul>	<ul style="list-style-type: none"><li>Repairs to current structure can be made to extend the service life of the bridge; however, additional cost for replacement of bridge is comparable to cost of rehabilitation</li><li>Requires significant roadway protection due to height of span and condition of foundations</li><li>Does not address road alignment and sightlines deficiencies</li></ul>	<ul style="list-style-type: none"><li>Requires significant roadway protection due to height of span and condition of foundations</li><li>Will improve road geometrics (alignment)</li><li>No property impact</li><li>Construction of integral abutments will reduce future maintenance needs</li><li>Could shift alignment of bridge closer to original road</li></ul>	<ul style="list-style-type: none"><li>Provides the most flexibility for improving the road alignment and sightlines in the bridge area</li><li>Some property impacts</li><li>Construction of integral abutments will reduce future maintenance needs</li></ul>
<b>Services/Utilities</b> <ul style="list-style-type: none"><li>Potential impact to services or utilities within the corridor</li><li>Accommodation of planned services/utilities</li></ul>	<ul style="list-style-type: none"><li>Does not impact existing minor or major services/utilities</li></ul>	<ul style="list-style-type: none"><li>Does not impact existing minor or major services/utilities</li></ul>	<ul style="list-style-type: none"><li>The gas and watermain currently supported along the structure will need to be maintained, protected and connected to the new structure</li></ul>	<ul style="list-style-type: none"><li>Electrical, communication, storm, water and gas utilities may need to be relocated.</li></ul>
<b>Construction Staging</b> <ul style="list-style-type: none"><li>Impact to existing traffic operations during construction</li></ul>	<ul style="list-style-type: none"><li>No construction impacts</li></ul>	<ul style="list-style-type: none"><li>Will likely require reducing traffic to a single lane in alternating directions</li></ul>	<ul style="list-style-type: none"><li>Disruption to transportation between the communities of Dundas and Greensville while the existing bridge is demolished and the new bridge is constructed</li><li>Requires more complicated staging relative to new alignment solution</li></ul>	<ul style="list-style-type: none"><li>Able to maintain traffic while constructing new structure. However, it may result in single-lane traffic and some complete closures at some points during construction/demolition.</li></ul>
<b>Drainage/Stormwater Management</b> <ul style="list-style-type: none"><li>Potential to increase stormwater run-off (water quantity)</li><li>Increase in pollutants to receiving watercourses (water quality)</li></ul>	<ul style="list-style-type: none"><li>No impacts to stormwater/ pollutant discharge as area of paved surface does not change</li><li>Does not provide opportunities to improve existing drainage/stormwater management</li></ul>	<ul style="list-style-type: none"><li>No impacts to stormwater/ pollutant discharge as area of paved surface does not change</li><li>Provide opportunities to improve existing drainage/stormwater management</li></ul>	<ul style="list-style-type: none"><li>Moderate increase in storm water runoff volumes due to increase in paved surface areas and associated salt distribution</li><li>Can be mitigated through provision of stormwater management facilities which would also treat existing runoff</li></ul>	<ul style="list-style-type: none"><li>Moderate increase in storm water runoff volumes due to increase in paved surface areas and associated salt distribution</li><li>Can be mitigated through provision of stormwater management facilities which would also treat existing runoff</li></ul>
Summary of Engineering Considerations				

LEGEND					
	Most Preferred			Least Preferred	





Alternative Solutions Evaluation: Cultural Environment






Evaluation Criteria and Sub-Factors	PLANNING ALTERNATIVE SOLUTION 1: Do Nothing	PLANNING ALTERNATIVE SOLUTION 2: Rehabilitate Existing Bridge	PLANNING ALTERNATIVE SOLUTION 3: Replace Bridge at Existing Location	PLANNING ALTERNATIVE SOLUTION 4: Replace Existing Bridge and Realign King Street West
CULTURAL ENVIRONMENT	This alternative provides a base to which the other alternatives can be compared. Under this alternative, no measures to improve the condition of the bridge are considered (status quo).	Repair and rehabilitate the existing bridge to address the structural deficiencies.	Replace existing bridge with new bridge that complies with current design standards	Remove the existing bridge and construct a new bridge downstream and realign King Street West
Archaeological Resources <ul style="list-style-type: none"><li>Potential to impact archaeological resources (previously undisturbed areas with high potential for recovery of artifacts)</li></ul>	<ul style="list-style-type: none"><li>No ground disturbance required; therefore, no risk to archaeological resources</li></ul>	<ul style="list-style-type: none"><li>Excavation work and other ground disturbance is unlikely. If bridge repairs are limited to existing structure, the risk is minimal.</li></ul>	<ul style="list-style-type: none"><li>Ground disturbance will require a Stage 2 Archaeological Assessment (monitoring / survey).</li></ul>	<ul style="list-style-type: none"><li>Ground disturbance will require a Stage 2 Archaeological Assessment at the current bridge location; archaeology has been completed at the new location (based on map provided alterations in realignment may require Stage 3 depends on the detailed design).</li></ul>
Built Heritage Resources <ul style="list-style-type: none"><li>Potential to impact known built heritage resources (i.e. Listed/ Designated under Part IV or V of the Ontario Heritage Act and/or identified as ‘culturally significant’ by the Municipality)</li></ul>	<ul style="list-style-type: none"><li>No impact to existing built environment; therefore, no risk to any built heritage resources, regardless of significance</li><li>The bridge is deteriorating, therefore there are potential impacts by neglect.</li></ul>	<ul style="list-style-type: none"><li>Low risk for impacts, as there is nothing significant of the structure itself; repairs to be completed in a manner sympathetic to the existing structure.</li></ul>	<ul style="list-style-type: none"><li>Preferable to construct the new bridge in the existing location from a heritage perspective as it maintains the existing cultural heritage landscape.</li><li>Heritage value is not intrinsic to the structure, but rather the location in the landscape</li><li>Reconstruction to be completed in a manner sympathetic to the existing structure</li></ul>	<ul style="list-style-type: none"><li>New structure would be constructed close to the existing one with consideration to the landscape and placement</li><li>Reconstruction to be completed in a manner sympathetic to the existing structure</li><li>Should the realignment impact the retaining wall an HIA would be required</li></ul>
Summary of Cultural Environment Considerations	●	●	◐	◑

LEGEND	●	◐	◑	◒	○
	Most Preferred			Least Preferred	












Alternative Solutions Evaluation: Social/Economic Environment

Evaluation Criteria and Sub-Factors	PLANNING ALTERNATIVE SOLUTION 1: Do Nothing	PLANNING ALTERNATIVE SOLUTION 2: Rehabilitate Existing Bridge	PLANNING ALTERNATIVE SOLUTION 3: Replace Bridge at Existing Location	PLANNING ALTERNATIVE SOLUTION 4: Replace Existing Bridge and Realign King Street West
<b>SOCIAL/ECONOMIC ENVIRONMENT</b>	This alternative provides a base to which the other alternatives can be compared. Under this alternative, no measures to improve the condition of the bridge are considered (status quo).	Repair and rehabilitate the existing bridge to address the structural deficiencies.	Replace existing bridge with new bridge that complies with current design standards	Remove the existing bridge and construct a new bridge downstream and realign King Street West
<b>Sustainability and City/ Regional Planning</b> <ul style="list-style-type: none"><li>Consistency with local and regional planning development objectives and economic growth</li></ul>	<ul style="list-style-type: none"><li>Inconsistent with City objectives of maintaining safe bridges and roads</li><li>Inconsistent with local planning objectives of increasing active transportation opportunities in the City of Hamilton</li></ul>	<ul style="list-style-type: none"><li>Inconsistent with local planning objectives of increasing active transportation opportunities in the City of Hamilton</li></ul>	<ul style="list-style-type: none"><li>Consistent with local planning objectives of increasing active transportation opportunities in the City of Hamilton</li></ul>	<ul style="list-style-type: none"><li>Consistent with local planning objectives of increasing active transportation opportunities in the City of Hamilton</li></ul>
<b>Potential sustainability improvements to the community, including greenhouse gas emissions</b> <ul style="list-style-type: none"><li>Improve local sustainability by providing alternative transportation modes in order to reduce auto dependency</li></ul>	<ul style="list-style-type: none"><li>No potential to add additional active transportation facilities for pedestrians and cyclists (sidewalks, bike routes)</li><li>No potential for sustainability improvements to the community</li></ul>	<ul style="list-style-type: none"><li>No potential to add additional active transportation facilities for pedestrians and cyclists (sidewalks, bike routes)</li><li>No potential for sustainability improvements to the community</li></ul>	<ul style="list-style-type: none"><li>Potential to add active transportation facilities for pedestrians and cyclists (sidewalks, bike routes)</li></ul>	<ul style="list-style-type: none"><li>Potential to add active transportation facilities for pedestrians and cyclists (sidewalks, bike routes)</li></ul>
<b>Impacts to Communities</b> <ul style="list-style-type: none"><li>Potential impacts to surrounding communities</li><li>Potential impacts to public facilities and recreation areas</li></ul>	<ul style="list-style-type: none"><li>Potential impacts to surrounding communities and users of public facilities in the future when the bridge becomes unsafe to use.</li></ul>	<ul style="list-style-type: none"><li>Some disruption in transportation between the communities of Dundas and Greensville while the existing bridge is repaired.</li><li>Temporary impacts to local recreation resources (e.g. Fisher’s Mill Park) from noise and dust from construction</li></ul>	<ul style="list-style-type: none"><li>Disruption to transportation between the communities of Dundas and Greensville while the existing bridge is demolished and the new bridge is constructed.</li><li>Temporary impacts to local recreation resources (e.g. Fisher’s Mill Park) from noise and dust from construction.</li></ul>	<ul style="list-style-type: none"><li>Approximately one (1) acre of land required for structure on new alignment.</li><li>Some loss of recreational space at Fisher’s Mill Park</li></ul>
<b>Summary of Socio-Economic Environment Considerations</b>				





LEGEND					
	Most Preferred			Least Preferred	






Alternative Solutions Evaluation: Natural Environment





Evaluation Criteria and Sub-Factors	PLANNING ALTERNATIVE SOLUTION 1: Do Nothing	PLANNING ALTERNATIVE SOLUTION 2: Rehabilitate Existing Bridge	PLANNING ALTERNATIVE SOLUTION 3: Replace Bridge at Existing Location	PLANNING ALTERNATIVE SOLUTION 4: Replace Existing Bridge and Realign King Street West
NATURAL ENVIRONMENT	This alternative provides a base to which the other alternatives can be compared. Under this alternative, no measures to improve the condition of the bridge are considered (status quo).	Repair and rehabilitate the existing bridge to address the structural deficiencies.	Replace existing bridge with new bridge that complies with current design standards	Remove the existing bridge and construct a new bridge downstream and realign King Street West
Species at Risk (SAR) <ul style="list-style-type: none"><li>Potential impacts to Species at Risk (SAR) and regulated areas</li></ul>	<ul style="list-style-type: none"><li>No impact to SAR.</li></ul>	<ul style="list-style-type: none"><li>Minimal clearing expected to allow work crews to access the bridge. Limited potential for impact to SAR and regulated areas.</li><li>No SAR were observed during Site investigations; however, the bridge and surrounding area has potential to house SAR. Mitigation during construction will be required.</li></ul>	<ul style="list-style-type: none"><li>Additional vegetation clearing would be required for demolition and construction phases of the Project. A greater potential to impact SAR habitat, if present. Mitigation to protect SAR and habitat required.</li><li>No SAR were observed during Site investigations; however, the bridge and surrounding area has potential to house SAR. Mitigation during construction will be required.</li></ul>	<ul style="list-style-type: none"><li>Additional vegetation clearing would be required for both demolition, realignment, and construction phases of the Project. A greater potential to impact SAR habitat, if present. Mitigation to protect SAR and habitat required.</li><li>No SAR were observed during Site investigations; however, the bridge and surrounding area has potential to house SAR. Mitigation during construction will be required.</li></ul>
Vegetation and Wildlife <ul style="list-style-type: none"><li>Potential impact to natural areas and habitats</li><li>Potential to impact vegetation and/or wildlife</li></ul>	<ul style="list-style-type: none"><li>No impact to natural areas or habitats.</li></ul>	<ul style="list-style-type: none"><li>Minor potential impacts from vegetation clearing are expected to allow work crews access to the bridge for rehabilitation work.</li></ul>	<ul style="list-style-type: none"><li>Additional vegetation clearing would be required for demolition and construction phases of the Project. A greater potential to impact to vegetation. Mitigation to protect surrounding vegetation required.</li><li></li></ul>	<ul style="list-style-type: none"><li>Additional vegetation clearing would be required for demolition and construction phases of the Project, and increase in total project footprint. A greater potential to impact to vegetation. Mitigation to protect surrounding vegetation required.</li><li></li></ul>
Water Resources and Fisheries <ul style="list-style-type: none"><li>Potential impact to watercourses and fisheries habitat</li></ul>	<ul style="list-style-type: none"><li>No impact to watercourses or fisheries habitat.</li></ul>	<ul style="list-style-type: none"><li>Potential for minor construction impacts including erosion and sedimentation during construction, but not expected to be of long duration.</li></ul>	<ul style="list-style-type: none"><li>Greater potential for demolition and construction impacts including construction, expected to be longer duration than Alternative 2.</li></ul>	<ul style="list-style-type: none"><li>Greatest potential for impacts during construction of new bridge and demolition of existing structure.</li><li>Opportunity to rehabilitate existing structures in/adjacent to watercourse.</li></ul>
Natural Hazards <ul style="list-style-type: none"><li>Potential impact to flooding and erosion</li></ul>	<ul style="list-style-type: none"><li>Some erosion reported along existing structure. This will not be addressed by the do-nothing alternative.</li></ul>	<ul style="list-style-type: none"><li>Potential for minor, temporary issues with flooding and erosion during construction.</li><li>Opportunity to correct the erosion issues that are occurring from the existing bridge.</li></ul>	<ul style="list-style-type: none"><li>Greater potential for issues with flooding and erosion during construction due to length of demolition/construction period.</li><li>Opportunity to correct the erosion issues that are occurring in association with the existing bridge.</li></ul>	<ul style="list-style-type: none"><li>Greatest potential for issues with flooding and erosion during construction due to length of demolition/construction period and footprint of two structures in the watercourse feature</li><li>Opportunity to correct erosion issues that occurring in association with the existing bridge.</li></ul>
Summary of Natural Environment Considerations				

LEGEND					
	Most Preferred			Least Preferred	

Alternative Solutions Evaluation: Capital Costs, Implementation, and Operating Costs

Evaluation Criteria and Sub-Factors	PLANNING ALTERNATIVE SOLUTION 1: Do Nothing	PLANNING ALTERNATIVE SOLUTION 2: Rehabilitate Existing Bridge	PLANNING ALTERNATIVE SOLUTION 3: Replace Bridge at Existing Location	PLANNING ALTERNATIVE SOLUTION 4: Replace Existing Bridge and Realign King Street West
CAPITAL COSTS, IMPLEMENTATION AND OPERATING COSTS	This alternative provides a base to which the other alternatives can be compared. Under this alternative, no measures to improve the condition of the bridge are considered (status quo).	Repair and rehabilitate the existing bridge to address the structural deficiencies.	Replace existing bridge with new bridge that complies with current design standards	Remove the existing bridge and construct a new bridge downstream and realign King Street West
<b>Costs</b> <ul style="list-style-type: none"><li>Relative cost in terms of capital costs, property costs, engineering studies cost, and maintenance costs</li></ul>	<ul style="list-style-type: none"><li>Low cost (estimated \$0.2M) - no immediate capital cost.</li><li>High cost for required on-going maintenance</li><li>High cost for the future replacement</li></ul>	<ul style="list-style-type: none"><li>Medium cost (estimated \$0.5 M to \$0.7 M) - not cost effective due to the asset life. Bridge replacement eventually required, even if rehabilitations completed.</li><li>Medium cost for required on-going maintenance</li><li>High cost for the future replacement</li></ul>	<ul style="list-style-type: none"><li>High cost (estimated \$2 M to \$2.4 M) for removal and construction of new bridge in same location due to staged construction</li><li>Low cost for required on-going maintenance on new bridge</li></ul>	<ul style="list-style-type: none"><li>Highest cost (estimated \$2.5 M to \$2.8 M) to construct new bridge and remove existing structure with additional approach road construction costs</li><li>Low cost for required on-going maintenance on new bridge</li></ul>
Summary of Cost (Implementation) Considerations				

LEGEND					
	Most Preferred			Least Preferred	

	PLANNING ALTERNATIVE SOLUTION 1: Do Nothing	PLANNING ALTERNATIVE SOLUTION 2: Rehabilitate Existing Bridge	PLANNING ALTERNATIVE SOLUTION 3: Replace Bridge at Existing Location	PLANNING ALTERNATIVE SOLUTION 4: Replace Existing Bridge and Realign King Street West
OVERALL RANK				
Ranking of Alternative Solutions	<p>This alternative solution is not recommended for the following reasons:</p> <ul style="list-style-type: none"><li>• Bridge will eventually be required to be removed or replaced if it is not rehabilitated which will eventually limit connectivity of the transportation system</li><li>• Removing the bridge would directly impact the existing land uses and impact traffic patterns in the area</li><li>• No potential to improve active transportation facilities for pedestrians and cyclists (e.g. sidewalks, bike routes)</li><li>• Not consistent with City of Hamilton policies for “Transportation Systems” and “Transportation and Infrastructure Corridors”, including maintaining or improving connectivity within and among transportation systems and modes (1.6.5.3)</li><li>• Does not meet roadway geometrics and sightline required standards at bridge western approach</li><li>• Bi-annual inspections will continue to be required and frequency will be increased to annually according to the bridge condition (highest maintenance cost)</li></ul> <p>The Bridge is deteriorating in terms of its structural integrity, resulting in increased concern for the safety of bridge users. In its current condition, the Bridge will not be able to function in the future and the bridge structure is in need of major repairs or possible replacement.</p> <p>This alternative solution does not address problems and opportunities for the project and therefore is not recommended.</p>	<p>This alternative solution is not recommended for the following reasons:</p> <ul style="list-style-type: none"><li>• Low potential to improve active transportation facilities for pedestrians and cyclists (e.g. sidewalks, bike routes)</li><li>• Requires significant roadway protection due to height of span and condition of foundations</li><li>• Repairs to current structure can be made to extend the service life of the bridge; however, additional cost for replacement of bridge is comparable to cost of rehabilitation</li></ul> <p>Rehabilitation of the existing bridge is not cost effective due to the asset life. Bridge replacement eventually required, even if rehabilitations completed. Medium level of on-going maintenance required</p> <p>This alternative solution does not address problems and opportunities for the project and therefore is not recommended.</p>	<p><u>Recommended to carry forward</u></p> <p>This alternative solution is recommended for the following reasons:</p> <ul style="list-style-type: none"><li>• High potential to improve active transportation facilities for pedestrians and cyclists (sidewalks, bike routes)</li><li>• High potential to provide improved public facilities (e.g. sidewalks, bike lanes) to encourage and promote alternative modes of transportation (e.g. walking, cycling)</li><li>• Potential to improve traffic safety</li><li>• Slightly improve roadway geometrics and sightline required standards at bridge western approach</li><li>• Low cost for on-going maintenance required on new bridge</li><li>• Estimated capital costs best addresses the problem statement.</li><li>• Technically preferred alternative solution.</li></ul> <p>This planning solution fully addresses the problem statement.</p>	<p>This alternative solution is not recommended for the following reasons:</p> <ul style="list-style-type: none"><li>• Approximately one (1) acre of land required for structure on new alignment.</li><li>• Some loss of recreational space at Fisher’s Mill Park Greatest potential for impacts during construction and demolition</li><li>• Highest estimated capital costs.</li><li>• The most amount of clearing required for demolition and construction phases of the Project therefore the greatest potential to impact vegetation, wildlife and aquatic community and habitat.</li><li>• Temporarily, the total footprint of the impact would be the greatest while new bridge is under construction and the old bridge remains.</li><li>• Electrical, communication, storm, water and gas utilities may need to be relocated.</li></ul> <p>This alternative solution does not fully address problems and opportunities for the project and therefore is not recommended.</p>

### PLANNING ALTERNATIVE SOLUTION 1: DO NOTHING

This alternative provides a base to which the other alternatives can be compared. Under this alternative, no measures to improve the condition of the bridge are considered (status quo).

This alternative solution does not address the problem and opportunity for the project and therefore is not recommended. The Bridge is deteriorating in terms of its structural integrity, resulting in increased concern for the safety of bridge users. In its current condition, the Bridge will not be able to function in the future and the bridge structure is in need of major repairs or possible replacement.

### PLANNING ALTERNATIVE SOLUTION 2: REHABILITATE EXISTING BRIDGE

Rehabilitation of the existing bridge is not cost effective due to the asset life. Bridge replacement will be eventually required, even if rehabilitation is completed. Medium level of on-going maintenance will be required. This alternative solution does not address problems and opportunities for the project and therefore is not recommended.

### PLANNING ALTERNATIVE SOLUTION 3: REPLACE BRIDGE AT EXISTING LOCATION

This alternative solution is recommended for the following reasons:

- High potential to improve active transportation facilities for pedestrians and cyclists (sidewalks, bike routes)
- Potential to improve traffic safety
- Opportunity to slightly improve roadway geometrics and sightline required standards at bridge western approach
- Low cost for on-going maintenance required on new bridge
- Estimated capital costs best addresses the problem statement.
- Technically preferred alternative solution.
- This planning solution fully addresses the problem statement.

### PLANNING ALTERNATIVE SOLUTION 4: REPLACE EXISTING BRIDGE AND REALIGN KING STREET WEST

This solution includes removal of the existing bridge, construction of a new bridge downstream, and realignment of King Street West. This alternative solution is not recommended for the following reasons:

- Approximately one (1) acre of land required for structure on new alignment.

- Some loss of recreational space at Fisher’s Mill Park.
- Greatest potential for impacts during construction and demolition.
- Highest estimated capital costs.
- The most amount of clearing required for demolition and construction phases of the Project therefore the greatest potential to impact vegetation, wildlife and aquatic communities and habitats.
- This alternative solution does not fully address problems and opportunities for the project and therefore is not recommended.

### 3.2.3 RECOMMENDED SOLUTION

The alternatives were assessed against the evaluation criteria as appropriate. The overall comparative evaluation of alternatives was based on a qualitative methodology and did not include the assignment of factor significance weightings, however transportation/safety, long term cost, and engineering considerations were considered to be the three most important criteria groupings.

The selection of the recommended alternative involved identifying and making trade-offs among the advantages and disadvantages of the alternatives. The alternative that had the best overall balance of advantages and disadvantages was recommended as the preferred alternative.

Based on the comparative analysis of alternative planning solutions (which is summarized in Table 3-2), “Do Nothing”, and Alternative Solutions #2 and #4 do not fully address the problem and opportunity for the project and therefore was not recommended.

In addition to Alternative Solution #3 having operational improvements, it will also address current and future travel demands, improve user safety, bridge structure and approaches, accommodate multiple modes of transportation (e.g. vehicles, walking, cycling) and will improve roadway geometrics and sightline required standards at the western approach of the bridge.

### 3.2.4 CONFIRMATION OF CLASS EA SCHEDULE

The alternatives identified to address the problem/opportunity required completion of a Schedule B or C. The recommended solution presented at the PIC required completion of Schedule C since it was replacement of the bridge and realignment of King Street West. However, based on the input received during the PIC and further review with the City of Hamilton it was determined that the preferred solution would change from the recommended solution and would now be replacement of the bridge in the existing location. The next step in the Class EA process is to confirm the Class EA Schedule for the preferred solution. For this Study the change in the preferred solution resulted in the project now be classified as a Schedule B. This

change to a Schedule B means that only Phases 1 and 2 of the Class EA process are required to be completed.



## 4 PREFERRED SOLUTION

The Project Team's recommended solution was reviewed with the City of Hamilton and the general public at the Public Information Centre (PIC) held on February 1, 2017. Based on the input received and technical assessments completed, Alternative Solution #3 (replace bridge at existing location) was confirmed as the preferred solution.

The recommended solution included replacing the King Street West Bridge at the existing location with a structure that accommodates pedestrians and cyclists, as well as vehicles. The structure will be a similar configuration to the existing. Sympathetic design elements to the existing bridge will be considered during the design phase, recognizing the bridge's moderate heritage value.

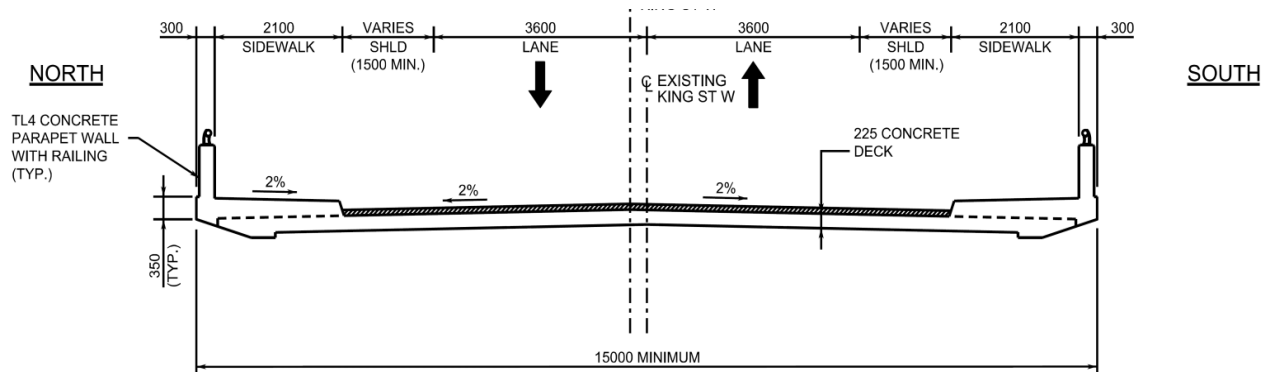
### 4.1 TRANSPORTATION

Following review of the alternative solutions discussed in Section 3.0 and compared to the "Do Nothing" (base case) alternative, it was concluded that the preferred planning alternative was comprised of the following improvements:

- replace existing bridge at existing location with new bridge that complies with current design standards (including the provision of active transportation)
- maintain a 3.6 metre two-lane roadway (one lane per direction)
- 2.1 metre sidewalk on both sides (with the possibility of phasing pedestrian facilities on the west side from a paved shoulder to a sidewalk in the future)
- 1.5 metre shoulder on both sides that can be transferred to bicycle lanes
- minor shifting of the King Street West centreline over the bridge area

A typical cross-section for the King Street West Bridge is illustrated in Figure 4-1.

Figure 4-1 - King Street West Bridge Cross Section



Subsequent to the selection of this technically preferred planning solution, preliminary alternative design concepts for implementing this solution were proposed as documented in this section of the Project File Report.

The purpose of this Class EA was to identify bridge improvements for King Street West crossing over Spencer Creek. The City of Hamilton has protected a right-of-way width for the new bridge that meets the City of Hamilton design criteria and would allow for King Street West to improve beyond the Spencer Creek area in the future. However, planning for any potential future improvements of King Street West beyond the bridge would be the responsibility of the City of Hamilton and other projects.

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## 4.2 PRELIMINARY DESIGN CONSIDERATIONS

Based on the Project Team's knowledge of the Study Area, discussions with the City of Hamilton and the Hamilton Conservation Authority, the following key objectives were developed to guide the detailed design to be developed in the next phase of the project:

- accommodate traffic demands
- improve public safety
- accommodate pedestrian and cycling needs (active transportation modes)
- minimize impacts to adjacent properties
- minimize need to acquire additional property
- minimize impact to existing utilities
- optimize project costs (provide best value for capital costs)

The key criteria considered in assessing alternative design concepts for this section of King Street West included:

- public safety
- traffic operations
- accommodation of cycling and pedestrian needs
- access to adjacent properties

In consideration of the above criteria, based on safety and traffic operational benefits, it has been concluded that the design concept with one 3.6 metre traveling lane (per direction), 2.1 metre sidewalks and 1.5 metre wide shoulders on both sides would comprise a "best fit". The benefits of this alternative are as follows:

- greater level of safety for pedestrians, cyclists and vehicles
- improved traffic operation and visibility at bridge approaches
- potential sidewalk improvements/ extension and connections to trail network in the area without property acquisition

- urbanize roadway cross section between the bridge and Bond Street South
- minimize impacts on the natural and land use environments

The multi-use trails and bike routes shall be signed to indicate the appropriate uses and direction of travel wherever appropriate. The avoidance of property acquisition requirements is to be confirmed in the detailed design phase following completion of a pre-engineering survey. It is also not expected that additional property will be required for utility relocation requirements. However, this too should be confirmed during detailed design.

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### 4.3 DESIGN CONSTRAINTS AND TECHNICAL ISSUES

In identifying and assessing alternative design concepts for the King Street West bridge crossing, and potential impact to the existing utilities many factors were taken into consideration. However since this is a Schedule B Class EA project, the formal process of evaluation of design alternatives (Phase 3 of the Class EA process) was not undertaken.

Through the evaluation of alternative solutions design issues were identified that will need to be considered further during detailed design.

The following are major roadway design constraints and technical issues that will need to be assessed during detailed design for the King Street West bridge:

- Sidewalks and other pedestrian facilities shall be designed in compliance with the Accessibility for Ontarians with Disabilities Act (AODA). The contract drawings developed during detail design shall address all AODA requirements.
- Meeting City of Hamilton design criteria but considering other means of reducing width of construction impacts and road operations.
- The gas and watermain currently supported along the structure will need to be maintained, protected and connected to the new structure.
- Traffic management plan for disruption to transportation between the communities of Dundas and Greensville will need to be prepared while the existing bridge is demolished and the new bridge is constructed.

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### 4.4 MITIGATION MEASURES AND MONITORING PLAN

Below is a summary of the recommended mitigation measures and monitoring plans identified through the Class EA process. Additional mitigation measures have been identified and discussed for the various components of the environment and these are described in the Existing Conditions section of this Project File Report. In addition to the project specific mitigation measures there are typical general

mitigation measures (e.g., erosion and sedimentation controls, temporary access during construction, temporary constructed related nuisance effects, etc.) that will be considered. During the Detailed Design stage the mitigation measures will be reviewed and refined where necessary.

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#### 4.4.1 NATURAL ENVIRONMENT

- Characteristic coolwater fish species were found in this reach of Spencer Creek and based on electrofishing surveys completed on July 10, 2017 captured eight species of fish within Spencer Creek.
  - ✓ *Mitigation measures and monitoring:* Therefore, during the Detailed Design phase, mitigation measures should take place which insure that impacts to the watercourse are minimized and in accordance with the measures established by the Department of Fisheries and Oceans (DFO, 2013).
- Impacts to the significant woodland will be minor in nature, as disturbance will be limited to the immediate vicinity of King Street West bridge. Further, the trees most likely to be impacted consist predominately of low quality, non-native and ornamental species, including Manitoba Maple, Siberian Elm, Norway Maple and White Mulberry.
  - ✓ *Mitigation measures and monitoring:* At the Detailed Design stage, if impacts to trees are anticipated, a survey by a qualified arborist should be completed and an Arborist Report and Tree Preservation Plan should be submitted.
- While not identified as a Significant Valleyland in the City of Hamilton Urban (2013) and Rural (2012) Official Plans, the riparian corridor surrounding Spencer Creek meets the qualifications of a Significant Valleyland established by the Provincial Policy Statement (OMMAH, 2014). From 60 m north of King Street West bridge to 40 m south of the bridge, the channel is man-made and composed primarily of concrete, armor stone and etched bedrock. While the species was not observed, moderate habitat potential for Eastern Flowering Dogwood exists along the forest edges within the Study Area, and low-moderate habitat potential for American Chestnut, American Columbo, American Ginseng and Butternut can be found in the forested portions of the Study Area.
  - ✓ *Mitigation measures and monitoring:* Proposed bridge works are not anticipated to impact the forest ecotypes where the above-mentioned species may find habitat. However, if it is determined at the detailed design stage that tree removal may be necessary, an assessment should be undertaken at that time to determine whether these species may find habitat, including the potential for bat maternity roost habitat.

- The wooded portions of the Study Area are connected to larger forests to the north, associated with the Spencer Gorge Escarpment Valley Life Sciences ANSI which is located as close as 110 m from King Street West bridge. This feature contains Significant Wildlife Habitat (SWH), including several classes of SWH which can also be found in the forest ecotypes in the southwest and north portions of the Study Area.
- ✓ *Mitigation measures and monitoring:* Impacts to this feature are not anticipated, as proposed development as part of this Municipal Class EA study is limited to the immediate vicinity of King Street West bridge. Additionally, the presence of a CNR rail line is located between the bridge and the ANSI.

#### 4.4.2 ARCHAEOLOGY/ BUILT HERITAGE

- A Stages 1 and 2 Archeological Assessment report was prepared by Historic Horizon Inc. for review by the Ministry of Tourism, Culture and Sport (MTCS) and the City of Hamilton. It should be noted that the Stages 1 and 2 archeological assessments completed cover a significantly larger area than the King Street West Bridge EA Study Area. The Stage 2 assessment by shovel test pits confirmed that most of it has been deemed to contain nothing having Cultural Heritage Value or Interest (CHVI). Those areas found to have no CHVI, where no artifacts or sites were found, are recommended for no further work. There were, several areas of exception which are listed in the Stage 2 report.
- ✓ *Mitigation measures and monitoring:* For the potential King Street West road realignment that was considered in the Fisher's Mill Park area, the study recommended Stage 3 Testing in order to determine the level of cultural heritage value and significance of any deposits and/or features related to the 19th century development of the Fisher's Mill complex and surrounding neighbourhood, as well as the potential for intact significant Aboriginal artifacts and camp-site(s). In addition, further Stage 2 Testing was recommended for the areas adjacent to King Street West on the north side of the road.
- ✓ *Mitigation measures and monitoring:* The westernmost structure adjacent to the creek, and to the west of the Fisher's Mill Park's boundaries, is recommended for archaeological monitoring during construction activities.
- ✓ *Mitigation measures and monitoring:* In general, for Fisher's Mill Park and the ROW between Bond Street and Spencer's Creek further Stage 3 historical background research including assessment rolls, business directories, census returns, and any other relevant historical documentation is recommended prior to conducting Stage 3 testing.

- Based on the results of research, site investigation, and application of the criteria from Ontario Regulation 9/06, the King Street West Bridge was determined to have elements of moderate cultural heritage value or interest based on the contextual and associative values, but not design/physical value. Based on the evaluation of the structure in conjunction with the feedback from the public, Alternative 3 (Replacement of the Bridge at the existing location) is the most preferred option. Maintaining an association with this location with the construction a new bridge of similar massing and minimally impacting the mill remnants will satisfy the heritage concerns.
- The rehabilitation of the structure would cause the lowest impact to the heritage attributes by keeping the existing massing and likely result in the least impact to the physical mill remnants. Alternative 3 (Replacement of the Bridge at the existing location), if done appropriately, is of equal standing with Alternative 2 (Rehabilitation of the current structure) for impacts to the heritage attributes of the bridge. The key factors for an appropriate replacement structure would be the retention of all physical assets of the mill, including those within the embankments of the current bridge structure and the maintaining of the massing of the current bridge while conforming the new bridge to current design standards. Should both of those objectives be achievable by a replacement for the bridge, then the impact of Alternative 3 would be equivalent to Alternative 2.
- ✓ *Mitigation measures and monitoring:* It is recommended that a structural assessment be conducted on the remnants of the mill ruins in close association with the bridge to determine the level of risk of any replacement/rehabilitation options proposed.
- ✓ *Mitigation measures and monitoring:* A bridge design be implemented that conforms to the current design standards and addresses the needs of transportation at this location while maintaining the overall massing of the existing bridge.
- ✓ *Mitigation measures and monitoring:* It is recommended that the City undertake full recording and documentation of the existing structure in situ prior to removal of the existing bridge structure
- ✓ *Mitigation measures and monitoring:* It is recommended that all elements related to the Remnants of the Gore Paper Mill be protected from impacts associated with the removal of the existing structure and the placement of the new bridge.

- ✓ *Mitigation measures and monitoring:* Where a change is proposed to either the Remnants of the Gore Paper Mill (including but not limited to the low stone walls, stone channel (former mill race), and ruins associated with the Gore Paper Mill located on the northwest side of the bridge) or to heritage property designated as 397 King Street West, the effects of that change should be assessed in an HIA.

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#### 4.4.3 CONSTRUCTABILITY AND TRAFFIC MANAGEMENT

- Replacing the existing bridge with new bridge that complies with current design standards would directly impact the existing land uses and impact traffic patterns in the area during construction. The long term disruption to transportation between the communities of Dundas and Greensville is expected during construction of the bridge. The traffic should be detoured and King Street West closed at bridge location during construction of the new bridge.
- ✓ *Mitigation measures and monitoring:* Traffic management plans for King Street West within study area should be developed as part of design process to mitigate impacts to traveling public and property access will be maintained. Through traffic will be encouraged to use an alternate route via detours.
- Access for the construction of the proposed bridge should be confirmed at detailed design stage, however it may be restricted to the west of the existing structure due to the steep slopes.
- ✓ *Mitigation measures and monitoring:* Adjacent property to the west of Spencer Creek may be able to be used. It is not anticipated that the replacing the existing bridge will require any property of to the southeast and southwest of the bridge.
- Condominium building at 397 King Street West (the Dundas District Lofts) is located to the east of the bridge.
- ✓ *Mitigation measures and monitoring:* The entrance to the building will be maintained at the current location and no impact is anticipated during construction.
- No impact during construction and changes to the entrance to 400 King Street West, west of the bridge are anticipated.



- Evidence of significant volumes of overland flow from the north has been identified to the west of the existing bridge (e.g., collapsed stone wall, flattened vegetation).
  - ✓ *Mitigation measures and monitoring:* Drainage between the new and existing bridge will be reviewed during detail design. It is anticipated that as part of other City projects, the road reconstruction will include replacement of the existing storm sewer and catch basins to facilitate adequate drainage.
- King Street West Bridge has a sluice weir located directly west of the structure and a spillway to the east and supports a 300 mm diameter insulated watermain below the east sidewalk. A 100 mm diameter gas main is also mounted to the east fascia on steel angles. In addition, there are overhead wires located approximately 2.5 m east of the existing structure.
  - ✓ *Mitigation measures and monitoring:* The existing gas and watermain that run along the existing bridge should be relocated as part of the bridge replacement. Utility work includes but may not be limited to storm sewer outlet relocation, Bell and Hydro relocations and added fill on an existing 300mm watermain.

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#### 4.4.4 STRUCTURAL DESIGN

- The preliminary bridge cross section design concept is considered to have an east-west orientation with no King Street West realignment. The alignment was governed by the fact that it is preferable for the bridge to be on tangent both vertically and horizontally.
  - ✓ *Mitigation measures and monitoring:* The span, substructure, and height of the bridge should be based on the vertical profile and existing grade and should be determined during detail design stage.
  - ✓ *Mitigation measures and monitoring:* At design stage a geotechnical study investigation is required to confirm location of the piles to support the abutments and new bridge.
  - ✓ *Mitigation measures and monitoring:* The horizontal curve for the roadway west of the proposed structure should be assessed at design stage in order to improve sight distance {(because of the vegetation and any other obstructions (i.e. barrier walls))}. This will need to be determined during design; the curve currently has a speed warning sign of 30 km/hr for southbound traffic.

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#### **4.4.5 OTHER ENGINEERING STUDIES**

It should be recognised that City has completed number of studies as relates to other projects in the study area, however the following studies should be identified at detail design stage and completed as required:

- Floodplain/hydraulic impact analysis
- Geotechnical assessment (slope stability, abutment foundations)
- Fluvio-geomorphic assessment
- Geomorphic assessment

## 5 PUBLIC, AGENCY, AND INDIGENOUS CONSULTATION

Consultation was an integral part of the study process. Opportunities for public, municipal, agency and Indigenous Community input were provided at key project milestones, as the Project Team recognized the important role that input from all stakeholders plays in the successful completion of any transportation study.

One of the primary objectives of this study was to promote, from the earliest planning stages, the making of decisions only after considering the potential environmental impacts. Consultation with affected parties played an important role in this regard, in terms of identifying potential environmental impacts, and providing a medium to communicate the Project Team's findings to stakeholders.

The study was organized such that affected parties were:

- Involved throughout the study at appropriate times
- Provided access to information
- Provided sufficient time to respond to questions and data requests
- Encouraged to participate in an issue identification/resolution process

During this study, members of the public, municipalities, various government agencies and other stakeholders were provided the opportunity to review and comment on the alternatives, the evaluation methodology, the recommended design and to identify concerns and comment on the proposed mitigation measures.

A mailing list of interested individuals was established at the beginning of the project and continuously updated throughout the study. The purpose of this list was to ensure that individuals who had an interest in the study were kept informed of upcoming events and the progress of the project. The list included all property owners within the Study Area, individuals who signed the visitor's register at the PIC, or who contacted the Project Team directly by phone, fax or email.

The public was formally involved in the decision-making process through one PIC, which was held at a project milestone of the recommended alternative solution. The PIC was an informal drop-in centre. Project Team members were available to meet with the attendees and respond to their questions and concerns during the session.

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### 5.1.1 STUDY COMMENCEMENT

A Notice of Study Commencement and PIC #1 was published in the *Dundas Star News* on Thursday January 19, 2017 and Thursday January 26, 2017 to inform the stakeholders (including the public and agencies) of the project. In addition, an initial notification letter advising of study commencement was distributed to stakeholders

(e.g., public, Indigenous Communities, municipalities, agencies) on the Project Team's mailing list. Interested parties were asked to contact the Project Team for further information and/or to be placed on the study mailing list.

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### 5.1.2 PUBLIC INFORMATION CENTRE

The PIC was held on Wednesday, February 1, 2017, from 6:00 p.m. to 8:00 p.m. at Dundas Baptist Church Gymnasium, 201 Governors Road, Dundas.

Prior to the PIC, the following measures were carried out in order to make details of the PIC known to Study Area residents and interested members of the public:

- The Notice was published in the *Dundas Star News* on Thursday January 19, 2017 and Thursday January 26, 2017
- A physical sign was posted near the bridge. The sign was installed on January 12, 2017, and was removed on April 19, 2017.
- The notice was published on the project website:

<https://www.hamilton.ca/city-planning/master-plans-class-eas/king-street-west-dundas-bridge-ea>.

- The PIC was featured on the City's "Public Meetings and Consultation" website leading up to the PIC:

<https://www.hamilton.ca/government-information/news-centre/public-meetings-consultations>

- Letters containing the notice were sent directly to individuals on the Project mailing list, including external agencies, Indigenous communities, and members of the public:
  - if applicable email addresses were available on file, the Notices were sent by email (on January 11, 2017)
  - where email addresses were not available, a physical copy of the notice was sent by mail during the first week of January, 2017



The purpose of this PIC was to present and discuss the following:

- “Welcome” board with clear notification of the project
- Purpose of PIC
- Study Overview
- Class EA Process
- Problem/Opportunities Statement
- Need and Justification
- Existing Bridge Characteristics

- Roadway Characteristics
- Existing Natural Heritage Features
- Cultural Heritage Evaluation Report
- Traffic Conditions Analysis
- Active Transportation
- Alternative Solutions
- Evaluation of the Alternatives
- Preliminary Recommended Alternative Solution
- Next Steps and Contact Information for the City and WSP

A total of fifty (50) people signed in at the PIC over the course of the evening. In addition to verbal comments, the Project Team encouraged visitors to express, in writing, all suggestions, comments or concerns that they had regarding the information presented. Eighteen (18) comments were received at the PIC, and thirteen (13) comments were received subsequent to the PIC.

Refer to Appendix A for a summary of PIC, which includes the PIC materials, comments provided on the comment sheets and through emails, along with the Project Team's responses.

Following the PIC, the PIC boards were posted on the project website, along with a blank comment sheet.

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### **5.1.3 INDIVIDUAL MEETINGS WITH STAKEHOLDERS**

One external stakeholder meeting was held with the Hamilton Conservation Authority (HCA). Numerous phone calls and emails with HCA took place at various stages throughout the study to obtain input on alternatives, design, and mitigation.

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### **5.1.4 FILING OF PROJECT FILE REPORT AND NOTICE OF STUDY COMPLETION**

The Notice of Study Completion serves the following purposes:

- it provides stakeholders with a final period of thirty (30) days to review the Project File report for the Study
- it informs the general public of the outcome of the Study and the nature of the resulting project

It also provides details on the Part II Order opportunities and protocol in the event anyone wants to challenge the recommendations of the report (described in Section 1.5.4).



A Notice of Study Completion advising of the start of the 30-day public review period and the location(s) where the PFR can be reviewed is to be mailed to all agencies, stakeholders and property owners on the project mailing list and published in the local paper (in the *Dundas Star News*).

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### 5.1.5 INDIGENOUS COMMUNITIES CONSULTATION

Consultation with the Indigenous Communities followed the same process that was used with the public and agencies. Potentially affected Indigenous Communities were identified based on previous projects undertaken by the City of Hamilton (which include those based on recommendations received from the Ministry of the Environment and Climate Change (MOECC) regarding affected/interested communities that should be consulted with for a project within the City of Hamilton). These Indigenous Communities were added to the stakeholder contact list and were thereby invited to attend the Public Information Centre through mailing of the Notice of Commencement and Public Information Centre and will be sent a copy of the Notice of Study Completion.

No separate meetings with Indigenous Communities were requested by and/or held as part of the Study.

In May 2017, Haudenosaunee Development Institute (HDI) contacted the City by phone informing that they received the Notice of Study Commencement and PIC and expressed interest in the study. Subsequently, the HDI requested to participate in remaining field work being undertaken as part of the EA, or to review work completed to date. Although it was not possible to accommodate the request to participate in the remaining environmental field work, the City offered to discuss the project in more detail and respond to any specific questions about the project. No further correspondence was received.

The following Indigenous Communities were notified of project start-up in January 2017, including the Notice of PIC, and notified of the filing of the PFR and study completion:

- Huron-Wendat Nation Council
- Six Nations Eco-Centre
- Six Nations of the Grand River Territory
- Haudenosaunee Chiefs Council
- Haudenosaunee Confederacy Council
- Mississaugas of New Credit First Nation
- Métis Nation of Ontario

### 5.1.6 STAKEHOLDER CORRESPONDENCE/ COMMENTS

As described in more detail in Section 5.1.2 above, a PIC was held on February 1, 2017, to share information about the project and to solicit stakeholder comment. The purpose of the PIC was to present information on the problem/opportunity statement, project objectives, the Municipal Class EA processes being followed, the development and evaluation of alternative solutions and identification of the recommended alternative solution. The display boards that were presented for review can be found in Appendix A.

Visitors to the PIC were encouraged to review the information presented and provide comments and feedback before they left. The PIC followed a “drop-in” format which allowed attendees to review the display information, present their comments and discuss them directly with City of Hamilton and their consultants. Members of the project team were available to answer questions at any time during the PIC.

Significant interest in the project was shown by the public at the PIC. Comments from PIC are summarized below (see Table 5-1). Correspondence received can be found in Appendix A.

The comment sheet included space to provide general comments as well as the following two questions:

- 1. Do you feel that the bridge is associated with heritage values and if so, why?**
- 2. How does the bridge fit into the story of the area’s history?**

There was a range of comments from those who felt the bridge was associated with heritage values (six of the responses received identified the bridge as having historical values). One individual felt that the bridge should be retained, but stone added to the façade to have it “blend in”. Another felt that the bridge is associated with the “entrance to the town and passage over Spencer Creek” and that it “fit into the story of other structures such as mill and structures to the north and Grave stone [sic “Memorial”] and park to the south”. The emphasis on the structure’s location and its association with past events was conveyed in these responses. Of the six responses, most felt the relocation of the bridge was an acceptable option.

The other respondents felt that the structure itself was not connected with heritage values (three responses) or chose not to respond to the question regarding its value (remaining responses). Instead, those individuals focused on other concerns, such as the impact of realignment on the nearby Chinquapin Oak, the potential for increased speed and safety of vehicles with the straightening of the turn, amongst others. Overall, the structure does not appear to be important, but its positioning is. The association with area history and heritage elements (association with mills, old wall, and the Chinquapin Oak, etc.) form the stronger narrative.

The primary concerns identified included the loss of greenery and road safety. Residents are interested in the conservation of the native trees at Fisher's Mill Park, specifically the Chinquapin Oak. They would like for this aspect of the park to remain and if it must be removed would opt for replanting these trees to retain the historical value of the area. They also prefer that the soccer fields remain intact.

Majority of residents who commented agree that if the curve is reduced, this will result in increased speeds of traffic and potentially major accidents. Residents have voiced that safe facilities accommodating pedestrians and cyclists alike should be implemented within the area.

In general, the majority of the comments related to the following topics:

- Implement safe facilities accommodating pedestrians and cyclists in the Study Area
- Interest in the conservation of the native trees at Fisher's Mill Park, specifically the Chinquapin Oak
- Keep soccer field intact
- Improvements to road alignment should not increase vehicular speed on King Street West/Highway 8 in the Study Area

Alternative #3 and Alternative #4 have stood out as favourable options among those who provided feedback.

**Table 5-1 Summary of comments received**

Comments provided by	Summary of comments received	Heritage values	City of Hamilton Response
Resident Comment	<ul style="list-style-type: none"> <li>• Bridge is associated with heritage values</li> <li>• New Bridge should be faced with stone to blend in.</li> </ul>	Yes	<ul style="list-style-type: none"> <li>– Heritage Impact Assessment (HIA) and Cultural Heritage Evaluation Report (CHER) were completed (refer to Section 3.3) and considered during selection of preferred alternative and in detailed design phase</li> <li>– Design suggestion is noted for consideration during next phase of detailed design</li> </ul>

Comments provided by	Summary of comments received	Heritage values	City of Hamilton Response
Resident Comment	<ul style="list-style-type: none"> <li>• Bridge is not associated with heritage values</li> <li>• Main concern is potential loss of use of the soccer field.</li> </ul>	No	<ul style="list-style-type: none"> <li>– Heritage Impact Assessment (HIA) and Cultural Heritage Evaluation Report (CHER) were completed (refer to Section 2.3.2) and considered during selection of preferred alternative and in detailed design phase</li> <li>– Preferred alternative is replacement of bridge in existing location – no anticipated impacts to soccer fields</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Alternative #4 seems like the best route to go with.</li> </ul>	No Response	<ul style="list-style-type: none"> <li>– This was originally recommended but after input from PIC and discussions with City Alternative #3 is now preferred</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Bridge is associated with heritage values as it provides entrance to the town and passage over Spencer Creek.</li> <li>• Consider the possible use of old bridge abutments to hold a pedestrian bridge.</li> <li>• The old road bed could be used as the trail to the pedestrian bridge and separate bikes/walkers from the car bridge.</li> <li>• Concerned that straightening the bend will increase the speed of traffic entering the town. Safety concerns should be addressed</li> </ul>	Yes	<ul style="list-style-type: none"> <li>– Heritage Impact Assessment (HIA) and Cultural Heritage Evaluation Report (CHER) were completed (refer to Section 2.3.2) and considered during selection of preferred alternative and in detailed design phase</li> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location</li> <li>– Design considerations are outlined further in Section 4</li> </ul>

Comments provided by	Summary of comments received	Heritage values	City of Hamilton Response
Resident Comment	<ul style="list-style-type: none"> <li>• Bridge fits into the story of other structures such as mill and structures to the north and Grave stone and park to the south.</li> <li>• The bridge should be replaced in its current location.</li> <li>• Reducing the corner does not fix the problem of bad drivers.</li> <li>• Park should be available for citizen use.</li> <li>• Realigning the road will cut through the trees and grave site.</li> <li>• Bicycle and pedestrian facilities should be provided from where they currently at the bridge, all the way up the hill.</li> </ul>	Yes	<ul style="list-style-type: none"> <li>- Heritage Impact Assessment (HIA) and Cultural Heritage Evaluation Report (CHER) were completed (refer to Section 2.3.2) and considered during selection of preferred alternative and in detailed design phase</li> <li>- Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location</li> <li>- Design considerations are outlined further in Section 4</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• If project involves road closure, it should be scheduled to coincide with larger project specifically project to replace storm sewers up escarpment sections of Highway 8. It has been proposed that both lanes close for 1 year.</li> </ul>	No Response	<ul style="list-style-type: none"> <li>- Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location and road closures will be required</li> <li>- Design considerations are outlined further in Section 4</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Move forward with Alternative #4 as long as it does not directly impact taxes in Dundas.</li> </ul>	No Response	<ul style="list-style-type: none"> <li>- Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Bridge should be left as is. Signs should be provided for the public.</li> </ul>	No Response	<ul style="list-style-type: none"> <li>- Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location</li> </ul>

Comments provided by	Summary of comments received	Heritage values	City of Hamilton Response
Resident Comment	<ul style="list-style-type: none"> <li>• Bridge is associated with heritage values.</li> <li>• Presentation should have had the planned realignment overlaid on a Google map for clarity and show the railway bridge.</li> <li>• Realignment of the bridge would result in the cutting of some trees.</li> <li>• Bridge should be fixed and not realigned.</li> <li>• Put a proper sidewalk from the small bridge to the railway bridge.</li> </ul>	Yes	<ul style="list-style-type: none"> <li>– Heritage Impact Assessment (HIA) and Cultural Heritage Evaluation Report (CHER) were completed (refer to Section 2.3.2) and considered during selection of preferred alternative and in detailed design phase</li> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with structure that also accommodates pedestrians and cyclists</li> <li>– Design considerations are outlined further in Section 4</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Bridge is not associated with heritage values.</li> <li>• Concerned about realignment causing an increase in the speed of vehicles. Whenever accidents happen potential for greater damage and increased densities mean more foot traffic as well.</li> <li>• Bridge realignment is preferred to have less movement away from current route.</li> <li>• Take opportunity to improve the conditions of Spencer Creek, address flow restrictions, remove concrete flow base, address exposure of pipes to high flows (e.g., natural gas)</li> <li>• Protect as many trees (especially Chinquapin Oak) as possible and do not affect play area/park.</li> <li>• Address active transportation needs (walking/cycling) so that safe passage is available</li> <li>• Do not appreciate community being used as speedway by out of towners</li> </ul>	No Response	<ul style="list-style-type: none"> <li>– Heritage Impact Assessment (HIA) and Cultural Heritage Evaluation Report (CHER) were completed (refer to Section 2.3.2) and considered during selection of preferred alternative and in detailed design phase</li> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with structure that also accommodates pedestrians and cyclists</li> <li>– No realignment of King St West will be part of this Class EA project</li> </ul>



Comments provided by	Summary of comments received	Heritage values	City of Hamilton Response
Resident Comment	<ul style="list-style-type: none"> <li>• River should be the key focus as the ditching of the creek is causing issues such as frazzle ice, flooding, habitat change.</li> <li>• Focus should be on recovering park on the north side as well as mill ruins and securing walking and biking route.</li> <li>• Would like bridge to be moved</li> </ul>	No Response	<ul style="list-style-type: none"> <li>- Heritage Impact Assessment (HIA) and Cultural Heritage Evaluation Report (CHER) were completed (refer to Section 2.3.2) and considered during selection of preferred alternative and in detailed design phase</li> <li>- Natural heritage features were also assessed as part of the comparative evaluation process</li> <li>- Design considerations are outlined further in Section 4</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Bridge is associated with heritage values.</li> <li>• Consider the flora and fauna that can be potentially affected, specifically the Chinquapin Oak which is a Heritage tree – ensure Native and Euro-Canadian stories are considered</li> </ul>	Yes	<ul style="list-style-type: none"> <li>- Heritage Impact Assessment (HIA) and Cultural Heritage Evaluation Report (CHER) were completed (refer to Section 2.3.2) and considered during selection of preferred alternative and in detailed design phase</li> <li>- Natural heritage features were also assessed as part of the comparative evaluation process</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Concerned about historical tree and soccer field which will be impacted and potentially lost.</li> <li>• Proposed map only conceptual and does not address concerns.</li> </ul>	No Response	<ul style="list-style-type: none"> <li>- Conceptual design is the level that is typically done for Phase 2 of the Class EA</li> <li>- Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location</li> <li>- Design considerations are outlined further in Section 4</li> </ul>

Comments provided by	Summary of comments received	Heritage values	City of Hamilton Response
Resident Comment	<ul style="list-style-type: none"> <li>• Likes the increased radius of the corner.</li> <li>• Keep the big tree in the park and allow for hiker trail on the nearby trails</li> </ul>	No Response	<ul style="list-style-type: none"> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with no changes to King St West alignment or impact to trees or park</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Realignment should be shifted so that the start of the deviation is slightly to the west as to not affect the Chinquapin Oak in Fisher Park.</li> <li>• Realignment will require significant cutting of trees and such presentations should be made to show how this would be minimized/mitigated through replanting and re-naturalization of the no-longer required road-bed.</li> </ul>	No Response	<ul style="list-style-type: none"> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with no changes to King St West alignment or impact to park and minimal effect on trees</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Alternative #4 should be implemented</li> </ul>	No Response	<ul style="list-style-type: none"> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with no changes to King St West alignment</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Bridge is associated with heritage values.</li> <li>• Bridge fits into the story of other structures such as mill and old wall on west side of District Lofts.</li> <li>• Alternative #3 should be implemented with slight regrading and softening of curve. Widening of the right-of-way to support pedestrian and cyclists could be done.</li> <li>• Alternative #4 will create speeding and cause problems for residents nearby.</li> </ul>	Yes	<ul style="list-style-type: none"> <li>– Heritage Impact Assessment (HIA) and Cultural Heritage Evaluation Report (CHER) were completed (refer to Section 2.3.2) and considered during selection of preferred alternative and in detailed design phase</li> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with no changes to King St West alignment</li> </ul>

Comments provided by	Summary of comments received	Heritage values	City of Hamilton Response
Resident Comment	<ul style="list-style-type: none"> <li>• Bridge is not associated with heritage values.</li> <li>• Further research should be done to clarify the aboriginal importance of the area as it full of arrowheads and may be a hunting area or settlement.</li> <li>• Fisher Mill Park must be kept intact.</li> <li>• Have complete road including sidewalks on both side and a bike lane on the upward side (downward bicycle traffic can travel with vehicular traffic).</li> <li>• Bike lane would act as a traffic calming measure to help speed reduction.</li> <li>• Pedestrian crossing should be placed about 50m downhill from the railway.</li> </ul>	No	<ul style="list-style-type: none"> <li>- Heritage Impact Assessment (HIA) and Cultural Heritage Evaluation Report (CHER) were completed (refer to Section 2.3.2) and considered during selection of preferred alternative</li> <li>- Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with structure that also accommodates pedestrians and cyclists with no changes to King St West alignment or impact to park</li> <li>- Design considerations are outlined further in Section 4</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Concerned that Alternative #4 will result in loss of park space at Fishers Mill Park and it is a necessity of the neighbourhood and community as a whole.</li> <li>• Concerned that re-routing the road and rebuilding the bridge will result in the loss of flora and fauna and suggests replanting in old road space.</li> </ul>	No	<ul style="list-style-type: none"> <li>- Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with no changes to King St West alignment or impact to park and minimal effect on trees</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Recommends removing bridge and replacing with a suitable structure on the same site.</li> <li>• Alternative option would be to build new bridge immediately beside old one.</li> <li>• Concerned that proposed bridge option would have increased costs and increased traffic speed which could result in more accidents.</li> <li>• Bridge should be designed in such a way as to encourage traffic to slow in keeping with other traffic calming measures around the City.</li> </ul>	No Response	<ul style="list-style-type: none"> <li>- Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with no changes to King St West alignment</li> <li>- Design considerations are outlined further in Section 4</li> </ul>

Comments provided by	Summary of comments received	Heritage values	City of Hamilton Response
Resident Comment	<ul style="list-style-type: none"> <li>• Approves of having bridge built south of the existing bridge and removal of the sharp bend.</li> <li>• Would like sidewalks to be implemented on either side with protective division from the roadway.</li> <li>• Implementing a stairway from top of the hill on King Street West down to Woodley's Lane. This would provide pedestrian and cyclists with a safe access.</li> </ul>	No Response	<ul style="list-style-type: none"> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with structure that also accommodates pedestrians and cyclists</li> <li>– Design considerations are outlined further in Section 4</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Improve the bend in the road and eroded nature of the sidewalk directly west of the bridge.</li> <li>• Bridge replacement should improve safety for those accessing Bruce Trail.</li> <li>• Supports a solution that provides a walking path between Greensville and Dundas and reconnect Bruce Trail along escarpment lands.</li> <li>• If Alternative #4 is selected, native trees should be replanted to make up for any lost during construction preferably on the north side and foot path should remain on the north side as well.</li> </ul>	No Response	<ul style="list-style-type: none"> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with structure that also accommodates pedestrians and cyclists</li> <li>– Design considerations are outlined further in Section 4</li> </ul>
Resident Comment	<ul style="list-style-type: none"> <li>• Project costs were not discussed in detail.</li> <li>• What will become of old bridge once new bridge is in?</li> <li>• For Alternative #4, does existing location have necessary retaining walls, and if so can they be assessed and made suitable instead of moving bridge to a new location?</li> <li>• How much virgin land/water way would be affected in Alternative #4?</li> </ul>	No Response	<ul style="list-style-type: none"> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with structure that also accommodates pedestrians and cyclists</li> <li>– Design considerations are outlined further in Section 4</li> </ul>

Comments provided by	Summary of comments received	Heritage values	City of Hamilton Response
Resident Comment (response to Dundas News)	<ul style="list-style-type: none"> <li>• Sacrificing parkland should not be more important than the personal safety of drivers and pedestrians using the bridge.</li> <li>• Suggests moving bridge 35m further up the hill and altering the curve so it isn't as severe.</li> <li>• Also suggests slicing off a small corner of the parkland.</li> </ul>	No Response	<ul style="list-style-type: none"> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with structure that also accommodates pedestrians and cyclists</li> <li>– No parkland is impacted by Alternative #3 and the new bridge meets City of Hamilton design criteria improvements to King St West would be have to be part of another project in the future</li> </ul>
Local Environmental Group	<ul style="list-style-type: none"> <li>• No concerns with regards to realignment of the King Street West Bridge over Spencer Creek as depicted in Alternative #4.</li> <li>• Adequate measures should be taken to ensure protection of the (canopy, trunk, roots) of the Chinquapin Oak during road work on the area.</li> <li>• Trees planted by the City on the North side of fence may need to be removed and if so, should be replanted elsewhere in the park.</li> <li>• There are remnants of stone walls on both sides of King Street which should be salvaged and reused as a landscape feature in Fisher Mill Park if the road is to be realigned.</li> </ul>	No Response	<ul style="list-style-type: none"> <li>– Preferred solution changed from Alternative #4 to #3 based on input received and is now replacement of bridge in existing location with no changes to King St West alignment or impact to trees or park</li> <li>– Design considerations are outlined further in Section 4</li> </ul>

### 5.1.7 HAMILTON CONSERVATION AUTHORITY

The Hamilton Conservation Authority (HCA) received all Municipal Class EA notifications and provided comments regarding the ecological/fisheries assessment, and the evaluation of alternatives.

In addition, a request for information was submitted to the HCA prior to conducting the field visits. This was to ensure that Natural Heritage Features and Species at

Risk with the potential to be in the vicinity of the Study Area were identified.

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#### **5.1.8 MINISTRY OF TOURISM, CULTURE AND SPORT**

In response to the Notice of Study Commencement, dated January 9, 2017, the Ministry of Tourism, Culture and Sport (MTCS) highlighted interest in this EA project as it relates to its mandate of conserving Ontario's cultural heritage, which includes:

- Archaeological resources, including land-based and marine
- Built heritage resources, including bridges and monuments
- Cultural heritage landscapes

If potential or known heritage resources exist, MTCS recommended that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to assess potential project impacts. They also requested to be advised whether any technical heritage studies will be completed for this EA project, and provide them to MTCS before issuing a Notice of Completion. If project screening has identified no known or potential cultural heritage resources, or no impacts to these resources, it should be included in the completed checklists and supporting documentation in the EA report or file.

As noted in Section 2.3 above, a Stages 1 and 2 Archeological Assessment report was prepared by Historic Horizon Inc. for review by the MTCS and the City of Hamilton. It should be noted that the Stages 1 and 2 archeological assessments completed cover a significantly larger area than the King Street West Bridge EA Study Area. The Stages 1 and 2 report documents the findings and recommendations of the Stage 1 background study and Stage 2 field assessment. Fieldwork was carried out in November and December 2015. There were, however, several areas of exception which are listed in the Stage 2 report. For the potential King Street West road realignment that was considered in the Fisher's Mill Park area, the study recommended Stage 3 Testing in order to determine the level of cultural heritage value and significance of any deposits and/or features related to the 19th century development of the Fisher's Mill complex and surrounding neighbourhood, as well as the potential for intact significant Aboriginal artifacts and camp-site(s). As well, further Stage 2 Testing was recommended for the areas adjacent to King Street West on the north side of the road.

The westernmost structure adjacent to the creek, and to the west of the Fisher's Mill Park's boundaries, is recommended for archaeological monitoring during construction activities.

In general, for Fisher's Mill Park and the ROW between Bond Street and Spencer's Creek further Stage 3 historical background research including assessment rolls,



business directories, census returns, and any other relevant historical documentation is recommended prior to conducting Stage 3 testing.

Correspondence can be found in Appendix A.

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#### **5.1.9 MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE**

In letters dated January 31 and March 8, 2017, Ministry of the Environment and Climate Change (MOECC) acknowledges that the City of Hamilton has indicated that the study is now following the Schedule B process as provided by the MEA Class EA to identify and assesses options for the bridge's rehabilitation. The MOECC provided a map showing features within the Study Area that should be considered as part of the study. The area falls within a highly vulnerable aquifer (HVA) and as such, the project must be evaluated in terms of potential impacts. As this bridge is in the immediate vicinity of surface water (Spencer Creek), in their letter they highlighted a number of matters to be considered. They also recommended to consult with the Ministry of Tourism, Culture and Sport to determine the study requirements, as well as to consult with Indigenous Communities.

Some of the issues that they raised will be given consideration during the Detailed Design stage. The mitigation measures have been considered and these will also be further developed during the Detailed Design stage. The Indigenous Communities identified by the MOECC were provided project information (notices) throughout the process as detailed in the section above on Indigenous Community Consultation. Due to the age of the bridge structure MTCS was contacted during the Class EA process.

Correspondence can be found in Appendix A.

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#### **5.1.10 TRANSPORT CANADA**

In response to the Notice of Study Commencement (email) dated February 15, 2017, Transport Canada indicated that does not require receipt of all individual or Class EA related notifications. They are requesting project proponents to self-assess if their project will interact with a federal property and require approval and/or authorization under any Acts administered by Transport Canada. They provided details and website links about the Canadian Environmental Assessment Act, 2012, including a summary of the most common Acts that have applied to projects in an Environmental Assessment context, such as: Navigation Protection Act (NPA), Railway Safety Act (RSA), Transportation of Dangerous Goods Act (TDGA), and Aeronautics Act.

Project team consulted the Directory of Federal Real Property<sup>1</sup> using the mapping function. No Federal Properties, Buildings or Contaminated Sites were identified in the study area, as detailed in self-assessment Memo presented in Appendix A.

Project team reviewed the list of the most common Acts that have applied to projects in an Environmental Assessment context to determine which may be applicable to the Project. In conclusion: approvals under the Act do not apply to the proposed project, including:

- Navigation Protection Act, R.S.C., 1985, c. N-22
  - ✓ Spencer Creek does not appear in Part 2 (Rivers and Riverines) of the Schedule in the Act
- Railway Safety Act (R.S.C., 1985, c. 32 (4th Supp.))
  - ✓ The proposed Project does not include railway operations of any kind
- Transportation of Dangerous Goods Act 1992 (1992, c. 34)
  - ✓ While the construction of the Project may involve the transport of dangerous goods to the construction Site (e.g. fuels), this will not be handled by the Proponent
- Aeronautics Act (R.S.C., 1985, c. A-2)
  - ✓ The Project does not include the construction of elevated structures, and does not have potential to cause interference between wildlife and aviation activities

Correspondence and self-assessment Memo can be found in Appendix A.

### 5.1.11 OTHER AGENCIES

#### ENBRIDGE

Enbridge was circulated the EA notice and in their email correspondence dated February 3, 2017, advised that Enbridge Pipelines Inc. has reviewed the subject application and does not have any facilities within the area.

#### UNION GAS

Union Gas was circulated the EA notice and in their email correspondence dated January 26, 2017, provided a GIS map showing the approximate location of gas plant in the area King Street West Bridge.

Correspondence can be found in Appendix A.

<sup>1</sup> Treasury Board of Canada Secretariat. DFRP/FCSI - Map Navigator. Accessed November 21, 2017 <https://map-carte.tbs-sct.gc.ca/map-carte/dfrp-rbif/map-carte.aspx?Language=EN&backto=http://www.tbs-sct.gc.ca/dfrp-rbif/home-accueil-eng.aspx>

### 5.1.12 PUBLIC REVIEW OF THIS REPORT AND NEXT STEPS

The documentation for this Schedule B project consists of a Project File Report (PFR), which is presented as this document. Placement of the PFR for public review completes the planning and preliminary design stages of the project.

As outlined in the Notice of Completion for this project, this PFR will be made available for public review and comment for a period of 30 calendar days. A public notice (Notice of Study Completion) will be published to announce commencement of the review period. To facilitate public review of this document, copies will be available at selected locations during regular business hours.

If, after reviewing this report, you have questions or concerns, please follow this procedure:

- Contact the City of Hamilton project manager to discuss your questions or concerns;
- Arrange a meeting with the above if you have significant concerns that may require more detailed explanations;
- If you raise major concerns, the City of Hamilton will attempt to resolve this issue(s). A mutually acceptable time period for this meeting will be set. If the issues remain unresolved, you may request the Minister of the Environment and Climate Change (see contact information below), by order, to require the City of Hamilton to comply with Part II of the EA Act before proceeding with the project; this is called a Part II Order request. The Minister may make one of the following decisions:
  - a) Deny the request with or without conditions
  - b) Refer the matter to mediation
  - c) Require the City of Hamilton to comply with Part II of the EA Act by undertaking one of the following:
    - Set out directions with respect to preparing the Terms of Reference and an Individual EA for the undertaking; or
    - Declare that the City (proponent) has satisfied the requirements for the preparation of a Terms of Reference; however, the proponent must still prepare an individual EA.

Minister's Office  
 Ministry of Environment and Climate Change  
 77 Wellesley Street West, 11<sup>th</sup> Floor, Ferguson Block  
 Toronto, ON M7A 2T5

A copy of the request must also be forwarded to the attention of the project manager at the City of Hamilton.

If no Part II Order requests are received, the City may proceed with detail design and construction of the recommended works as presented in this report.

Information will be collected in accordance with the *Municipal Freedom of Information and Protection of Privacy Act*. All comments, with the exception of personal information, will become part of the public record.