



CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT
Hamilton Water Division

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	October 3, 2016
SUBJECT/REPORT NO:	Highway 5 Grindstone Bridge Utility Relocation Class Environmental Assessment and Conceptual Design (PW16085) (Ward 15)
WARD(S) AFFECTED:	Ward 15
PREPARED BY:	Winston Wang Project Manager, Infrastructure Planning & Systems Design 905-546-2424, Extension 4092 Udo Ehrenberg, Manager, Infrastructure Planning & Systems Design 905-546-2424, Extension 2499
SUBMITTED BY:	Mark Bainbridge Acting Director, Hamilton Water
SIGNATURE:	

RECOMMENDATION

- (a) That the General Manager, Public Works be authorized and directed to file the Notice of Completion and issue the Project File Report for the Class Environmental Assessment for Highway 5 Grindstone Creek Bridge Utility Relocation & Conceptual Design for the mandatory 30-day public review period;
- (b) That upon completion of the 30-day public review period, the General Manager, Public Works be authorized and directed to proceed with detailed design and implementation of the preferred solution of the Class Environmental Assessment for Highway 5 Grindstone Creek Bridge Utility Relocation and Conceptual Design, provided that no Part 2 Orders by the Minister of the Environment and Climate Change are received;
- (c) That the detailed Design and construction component, at a cost of approximately \$3.15M, be funded as part of the 2017 Capital Rate Budget.

EXECUTIVE SUMMARY

The Hamilton Water Division has invoked the Class Environmental Assessment (Class EA) process to determine the best alternative for the Highway 5 Grindstone Creek Bridge utilities relocation by applying the Triple Bottom Line approach to decision making. This project is separate from the project that will be necessary to replace the transportation bridge itself.

The Highway 5 Grindstone Creek Bridge is close to the intersection of Mill Street and Highway 5 in the community of Waterdown, City of Hamilton. Its function includes service to vehicles and pedestrians to cross the CPR Railroad and Grindstone Creek. As well it supports sewers and other private utilities. Refer to Appendix A to Report PW16085 for a map of the Study Area. The bridge was constructed in 1966 and is now reaching the end of its lifespan. The bridge is slated to be reconstructed or rehabilitated within the next 10 years. The existing vehicle bridge conveys a considerable amount of traffic and is an integral part of the local Waterdown transportation system. In an effort to reduce closure times of Highway 5 and thereby reduce inconvenience to local residents and businesses during reconstruction of the existing bridge, the City has initiated this study to look at the feasibility of relocating existing utilities which are part of the existing bridge prior to rehabilitation or reconstruction.

The relocation alternatives considered a range of solutions from existing utilities remaining on the bridge, to partial and whole relocation of existing utilities, to a dedicated utility bridge side by side with the existing bridge. Public consultation in the form of notices to Stakeholders and two Public Information Centres held on November 5, 2015 and May 3, 2016 revealed that the main concerns of the stakeholders include establishing a Grade Separation Agreement and an Overhead Pipe Utility Agreement with Canadian Pacific Railway (CPR), maintaining the slope stability of the valley bank and abutment area, mitigating environmental impacts i.e. erosion and sediment control during construction, and performing proper traffic control during construction. The preferred alternative for the utility relocation, considering the Triple Bottom Line criteria, is as follows:

Highway 5 Grindstone Creek Bridge Utility Relocation – Relocation of Existing Utilities to a separate Utility Bridge in advance of the vehicle bridge rehabilitation, which would allow for an expedited rehabilitation of the existing vehicle bridge.

The primary advantages for this alternative include:

- Reduced vehicle bridge closure time during rehabilitation thereby minimizing impact to businesses, residents and commuters;
- Ease of long term operation and maintenance of utilities as they will be more accessible on a new separate utility bridge;
- The lowest capital cost of the three alternatives that are being considered;
- Relatively low construction risks, i.e. compared to deep tunnels;

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- Less impact on groundwater;
- No need for property acquisition;
- Ease of construction including proposed bridge rehabilitation and coordination with other capital projects.

Upon completion of the mandatory 30-day review period of the Class EA, a detailed design of the preferred alternative will be initiated with construction commencing as early as 2018.

Funding for the detailed design component of the project will be part of the 2017 Capital Budget deliberations. Construction costs have been planned for in the 2018/2019 Capital Budget and will be verified for Council as part of the 2018 Capital Rate Budget.

Alternatives for Consideration – See Page 11

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial:

The recommendations in this report require the allocation of \$3.15 million for the preferred utility bridge solution, which includes 25% for engineering design and contingencies.

A perpetual fee of \$1,000 per year is required to pay Canadian Pacific Railway Corporation under the *Overhead Pipe Utility Agreement* between CPR and the City of Hamilton.

Staffing: There are no staffing implications associated with the recommendations.

Legal:

There are no known legal implications associated with this recommendation. However, Ministry of the Environment and Climate Change (MOECC) approval of municipal undertakings such as water and wastewater projects are subject to Ontario's Environmental Assessment Act. The Act allows for the approval of Class Environmental Assessment (Class EA) and the municipality has the option of following the planning process set out in the Municipal Engineers Association Class Environmental Assessment (amended in 2007 & 2011) document. The City is required to file the Class EA report on the public record for a minimum 30-day review period for the Class EA to have been satisfied.

HISTORICAL BACKGROUND

The Highway 5 Grindstone Bridge (No. 451) was designed and constructed in 1966 and services the residents and businesses in the Waterdown area. It is a bridge with concrete piers to support a multi-span concrete beam structure.

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A 1989 condition survey, completed when the structure was under the jurisdiction of the Ministry of Transportation of Ontario (MTO), identified severe levels of corrosion potential in the deck. In 1992, some rehabilitation work was completed.

In 2014, Marshall Macklin Monaghan (MMM) Group Limited was retained to conduct another condition survey and MMM's recommendation was that "no immediate major rehabilitation is required but the City should initiate the process to have the entire structure replaced within the 5 to 10 year time-frame".

In 2014, Stantec Consulting was also retained by the City of Hamilton to undertake a review of the bridges included in the 2010 Bridge Master Plan to identify cultural heritage value or interest, based on the Municipal Heritage Bridges Cultural, Heritage and Archaeological Resources Assessment Checklist, which was prepared by the Municipal Engineers Association for Municipal Class Environmental Assessment (MCEA). The Stantec report concluded that this bridge "does not satisfy criteria provided in Part B of the MCEA Checklist" as such, there is no need to conduct a Cultural Heritage Evaluation for this bridge before rehabilitation.

As mentioned above, the vehicle bridge is approaching the end of its life span and will be rehabilitated within the next 5 to 10 years. However, in advance of this rehabilitation, all utilities on the bridge, including a 500 mm sewer forcemain, 250 mm gravity sanitary sewer, a portion of 300 mm watermain, Bell communication cables, etc, will have to be relocated for this change to take place in a cost effective manner.

A Project Team, including Public Works staff and consulting engineers, was developed to undertake this Class EA Study. Other key staff and sub-consultants, including Environmental Scientists, Heritage Planners and Archaeologists, were engaged as required to provide support for various components of the Study.

The Class EA was completed as a Schedule "B" within the Municipal Class Environmental Assessment process. The Class EA for this project included the public and Review Agency consultation, evaluation of alternatives, assessment of impacts of the proposed works, and identification of measures to mitigate any adverse impacts. Upon completion of the study, a Project File Report documenting the planning and decision-making process and preferred relocation alternative was prepared and is ready for Public Review. Pending approval of this recommendation, a separate advertisement will be issued to advise the public and stakeholders of the Notice of Completion of the Class EA.

The preferred alternative for this utility relocation is described as follows:

Highway 5 Grindstone Creek Bridge Utility Relocation – Relocation of Existing Utilities to a separate Utility Bridge in advance of the bridge rehabilitation, which would allow for an expedited rehabilitation of the existing bridge.

The primary advantages for this alternative include:

- Reduced bridge closure time during rehabilitation thereby minimizing impact to businesses, residents and commuters;
- Ease of long term operation and maintenance of utilities as they will be more accessible on a new separate utility bridge;
- The lowest capital cost of the three alternatives that are being considered;
- Relatively low construction risks, i.e. compared to deep tunnels;
- Less impact on groundwater;
- No need for property acquisition;
- Ease of construction including proposed bridge rehabilitation and coordination with other capital projects.

The above preferred alternative satisfies the requirements for the relocation of utilities while balancing the social, environmental and economic considerations. The project implementation will ensure:

- A dedicated utility bridge will create coordination efficiency when undertaking rehabilitation of the existing transportation bridge;
- Long-term service to the community;
- Improved operation and maintenance;
- Better traffic control;
- And protection of public health, property, and environment.

The recommendations contained in this report support the Mission Statement of the Public Works Business Plan "Innovate Now" - "Provide safe, strategic and environmentally conscious services that bring our communities to life".

Upon completion of the study, a Project File Report documenting the planning and decision making process, and the preferred utility relocation alternative was prepared, which is now ready for public review.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

These recommendations are consistent with the Urban Official Plan.

Other policies affecting or impacting this Report include:

- *Ontario Environmental Assessment Act;*
- *Ontario Environmental Protection Act.*

This study and associated process meets the requirements of both these acts.

RELEVANT CONSULTATION

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The Ward Councillor has been notified of the recommendations of this report. It is expected that partial vehicular access to the Highway 5 Grindstone Bridge be maintained at all times during construction of the utility bridge.

Public and Review Agency consultation is an integral and legislated component of any Municipal Class Environmental Assessment study. Stakeholders are initially notified of the study with a formal Notice of Commencement advertised in the local newspaper. Review Agencies are notified directly by mail or email. Please refer to Appendix B to Report PW16085 for the Agency Mailing List.

Project Stakeholder and Review Agency lists are developed at the onset of the study and maintained throughout, thus ensuring all interested parties are kept informed. All Stakeholders are invited and encouraged to comment on the project at any time during the study.

Categorically, the Agency and Stakeholder Contact Lists include the following groups:

- Provincial Ministries and Agencies;
- Federal Agencies;
- First Nations;
- Property owners/businesses adjacent to the existing bridge and within the catchment and/or study area;
- Others (e.g. Municipal, Utilities, School Boards, etc.).

Two Public Information Centres (PIC's) were held at the Knox Presbyterian Church on November 5, 2015 and May 3, 2016 respectively. Feedback from attendees focused on personal concerns with traffic control during construction in addition to the concern for potential impact of proposed alternatives on day to day activities of the community. Key feedback from review agencies to date are summarized as follows:

- Canadian Pacific Railway (CPR) Corporation – Two meetings took place between City staff, Aquafor Beech Ltd, the City of Hamilton, and CPR Corporation staff. The CPR Corporation is concerned with entry, construction, operational safety, and geo-technical protocol for utilities installed on, above or at the railway Right of Way (ROW). A minimum clearance of 7.03 meters is required above the top of rail. A key concern is the requirement for two permits: one is a Grade Separation Agreement; and the other is an Overhead Pipe Utility Agreement. In addition, there will be requirements for flag personnel during construction of the utility bridge. These services are generally required when any works may impact the operation and safety of the existing railway. Flag personnel will be required when the utility bridge is set in place and may be required during construction of the abutments and potentially the storm sewer relocation. A lead time of 60 days is required. CPR staff also noted that there will be a perpetual fee to cover the cost of utilities being located within CPR property (approximately cost \$1,000/year);

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- Conservation Halton (CH) – Their interests relate to the presence of natural heritage features and CH regulated areas within the study area, including tributaries of Grindstone Creek. One of their major concerns was the requirement to undertake a geotechnical analysis of slope stability, which will be addressed at the future detail design stage. This was deemed to be the most appropriate stage to confirm that the abutments are designed to meet not only CH's requirements but also additional considerations that will arise as part of detail design (loading, type of footings required, integration of abutment into infrastructure requirements, integration of design with proposed bridge rehabilitation, etc). Other concerns include provision of drawings outlining top of bank, floodplain, and stable slope line; risk mitigation measures, i.e. spills; provision of mitigation measures that minimize disturbance of the valley and riparian vegetation; impacts of hydraulics for conveyance and regulatory flood elevations; Bat habitat assessment; and other environmental mitigation methods during construction, i.e. erosion and sediment control and impact on aquatic ecology. These concerns have been addressed in the Class EA Report;
- Ministry of Environment and Climate Change (MOECC) – For the utility relocation away from the bridge, MOECC acknowledges that a Schedule 'B' Municipal Class Environmental Assessment (EA) process is undertaken under the MEA Class EA in order to identify, evaluate and determine the preferred alternative for addressing the state of this bridge and associated infrastructure. MOECC requires that appropriate mitigation measures be taken prior to construction; that, if the construction involves any dewatering, storage or diversion of water in excess of 50,000 litres per day, a Permit to Take Water is required; and other water protection measures and precautions be taken. In addition, MOECC requires adequate consultation with First Nation and Metis Communities who have the potential to be affected by this project. This has been done through mailing notifications;
- Niagara Escarpment Commission (NEC) – Their concern is mainly focused on the Urban Area, which is regulated by O. Reg. 828, in which "the maintenance, repair or renewal of sewers, pipes, mains, cables including fiber optic cables, wire or other apparatus connected with public utilities, including equipment shelters and lockers and the breaking open of any municipal road or highway or other land for this purpose" and "the construction or installation of sewers, pipes, mains, cables including fiber optic cables, wire or other apparatus connected with public utilities, including equipment shelters and lockers in an area designated as Urban Area in the Niagara Escarpment Plan (NEP)" are exempt from development control. Part of the subject lands are in the Escarpment Natural Area where only essential transportation and utility facilities are permitted. It was verified with NEC that a Development Permit would not be required;
- Ministry of Tourism, Culture and Sport (MTCS) – Their concerns mainly focus on three (3) areas: archaeological resources, built heritage resources, including

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bridges and monuments and cultural heritage landscapes. In terms of the environmental assessment reporting, they require that all technical heritage studies and their recommendations are to be addressed and incorporated into EA projects. The City is required to advise MTCS whether any technical studies will be completed for the EA project and provide them to MTCS before issuing a Notice of Completion. Based on Stantec's 2010 Bridge Master Plan, there are no known or potential cultural heritage resources, or no impacts to these resources. Therefore, the EA Report will include the completed checklists and supporting documentation.

The recommendations of this staff report are in itself the final stage of consultation which is an inherent part of the Class EA process. The project team will receive and attempt to mitigate any Stakeholder concerns or Request for a Part II Order that is initiated within the mandatory 30-day review period.

ANALYSIS AND RATIONALE FOR RECOMMENDATION

By applying the Municipal Class EA process the project followed the legislated multi-phased analysis rationale. In brief, the phases may be summarized as follows for this Schedule B project (ONLY PHASES 1 AND 2 OF THE MUNICIPAL CLASS EA APPLY, prior to PHASE 5 Implementation):

- Phase 1 - Identify the problem (deficiency) or opportunity.
- Phase 2 - Identify alternative solutions to address the problem or opportunity by taking into consideration the existing environment, and establish the preferred solution taking into account public and review agency input. At this point, determine the appropriate Schedule for the undertaking and document decisions in a Project File for Schedule B projects, or proceed through the following Phases for Schedule C projects.
- Phase 3 - Examine alternative methods of implementing the preferred solution, based upon the existing environment, public and review agency input, anticipated environmental effects and methods of minimizing negative effects and maximizing positive effects.
- Phase 4 - Document, in an Environmental Study Report a summary of the rationale, and the planning, design, and consultation process of the project as established through the above Phases, and make such documentation available for scrutiny by review agencies and the public.
- Phase 5 - Complete contract drawings and documents, and proceed to construction and operation; monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the completed facilities.

Shown again in tabular format below the main elements of the Class EA planning process are incorporated in the following five phases:

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	PHASE 1		PHASE 2		PHASE 3		PHASE 4		PHASE 5
	Problem or Opportunity	→	Alternative Solutions	→	Alternative Design Concepts for Preferred Solution	→	Environmental Study Report	→	Implementation
Consultation Requirements	Optional		Mandatory		Mandatory		Mandatory		Optional

The planning and conceptual design process was undertaken in such a way as to allow a reviewer to trace each step of the process. In particular, the documentation explained the reasons for the criteria used to identify and assess the alternatives, the proponent's weighing of these criteria, and the decision-making process followed.

To ensure that the planning and conceptual design process is easily traceable, the study ensured that:

- The analysis is understandable to the reasonable lay observer;
- All conclusions drawn from the analysis follow logically from the information gathered and presented; and
- A reasonable lay observer is able to replicate the conclusions based on the information presented.

Specifically, the narrative of this study is summarized as follows with detailed documentation in the Project File Report under separate cover.

The Class EA Problem/Opportunity Statement was established at the onset of the study as follows:

To identify and evaluate the alternative solutions to permit the replacement and potential relocation of existing utilities (water, wastewater, hydro, telecommunications utilities, etc.) as part of future bridge rehabilitation works.

The objectives of the Schedule B, Class EA project will be to review and compare alternative solutions for the utility relocation (and relevant construction impact), in order to address the above-noted concerns and to identify the preferred solution.

All reasonable alternatives that meet the requirements of the Problem/Opportunity Statement were identified. The following is a list of the three (3) alternatives considered in the study:

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Alternatives	Description
1. Do Nothing (Existing Utilities Remain on Bridge)	<ul style="list-style-type: none">Existing utilities would be temporarily relocated during the bridge rehabilitation, which will result in significant impact to businesses, residents and trafficLong term operation and maintenance of existing utilities is not optimal due to their respective locations under Grindstone Creek and within the existing bridgeHigher capital cost due to lengthened construction process
2. Relocation of Existing Utilities	<ul style="list-style-type: none">All existing utilities would be relocated to a separate utility bridge in advance of bridge rehabilitationRelocation of utilities will allow for an expedited rehabilitation of the existing bridgeLowest capital cost of three alternativesRequirements for approval from Conservation Halton, Bell utilities and Canadian Pacific Railway (CPR) Corp.
3. Relocation of Some Existing Utilities	<ul style="list-style-type: none">Existing sanitary forcemain would be relocated subsurface (under Grindstone Creek)Relocation of other utilities (bell and sanitary sewer) would be placed on a utility bridgeRequirements for approval from Conservation Halton and Canadian Pacific Railway (CPR) Corp.Higher capital cost due to tunnelling for sanitary forcemain and acquisition of property

Evaluation Criteria reflect the Triple Bottom Line evaluation methodology. The evaluation criteria established by the Project Team are summarized below. A detailed breakdown of each category is included in the Project File under separate cover:

- Natural Environment;
- Economic Considerations;
- Social and Cultural Environment;
- Technical and Operational Considerations.

The evaluation process focused on identifying three levels of comparison between the evaluation criteria for each of the alternatives. The three levels are:

- Most Preferred;
- Moderately Preferred;
- Least Preferred.

For the alternatives where the evaluation criterion is the best, “most preferred” will be assigned. If the alternative has a disadvantage for that evaluation criterion, then it will be assigned “least preferred”. The “moderately preferred” level is assigned when there is no real preference between the alternatives. The intent of this method of evaluation is to identify, for each evaluation criterion, which alternative or alternatives have an advantage or are preferred. Once this evaluation process is completed for all criteria, it can then be determined which alternative(s) has the overall preference.

Each alternative was screened against the evaluation criteria. The “most preferred” alternative was deemed to be the preferred alternative. The preferred alternative is to construct a separate utility bridge and relocate the utilities to the utility bridge for further vehicle bridge rehabilitation/replacement to mitigate impacts to local residents, businesses and the environment.

Mitigation measures for any negative environmental impact of the preferred alternative have been identified and become conditions of the Implementation Phase of the Class EA. Detailed mitigation measures are included in the Project File Report under separate cover.

Public and Stakeholder consultation is an integral part of the Class EA process. See the Relevant Consultation section of this Report and the Project File for more details.

The final step in the analysis rationale before proceeding to implementation of the preferred alternative is to undertake the mandatory 30-day review. A Notice of Completion of the Class EA as recommended herein will be issued in the fall of 2016. Notices will be issued via newspaper advertising and direct mail out to all members of the Stakeholder and Agency Contact lists. The Project File will be placed on public record along with contact information to receive concerns. All attempts will be made to mitigate all expressed concerns. Should resolution of a concern be unattainable the conflict may be escalated by the opponent to the Minister of the Environment and Climate Change (MOECC) for a decision.

The above analysis rationale is a prescribed process under the Municipal Class Environmental Assessment (MCEA). The project was completed and considered to be in full compliance with the MCEA process.

ALTERNATIVES FOR CONSIDERATION

The recommended alternative solutions have been identified using an evaluation and screening process that fulfils the requirements under the Municipal Engineers Association (MEA) Municipal Class EA document for Schedule B projects.

There is one alternative for Council to consider with respect to the recommendations of this report:

To not file the Highway 5 Grindstone Bridge Utility Relocation Class EA and Conceptual Design Project File Report with the City Clerk for a minimum 30-day public review and, as a consequence, not proceed with implementation.

Should Council not wish to approve the filing of the Highway 5 Grindstone Creek Bridge Utility Relocation Class Environmental Assessment and Conceptual Design, the Municipal Class EA process would be considered incomplete by the provincial government. As such, the City will not have approval under provincial environmental legislation to have the option to pursue the construction of the preferred solution to Highway 5 Grindstone Bridge Utility Relocation as a Schedule “B” project. The outcome would be equivalent to the “Do Nothing” alternative, which will result in the risk of long-term operation and maintenance of utilities and higher cost of the vehicle bridge rehabilitation.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Community Engagement & Participation

Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community.

Economic Prosperity and Growth

Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

Healthy and Safe Communities

Hamilton is a safe and supportive city where people are active, healthy, and have a high quality of life.

Clean and Green

Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.

Built Environment and Infrastructure

Hamilton is supported by state of the art infrastructure, transportation options, buildings and public spaces that create a dynamic City.

Culture and Diversity

Hamilton is a thriving, vibrant place for arts, culture, and heritage where diversity and inclusivity are embraced and celebrated.

Our People and Performance

Hamiltonians have a high level of trust and confidence in their City government.

APPENDICES AND SCHEDULES ATTACHED

Appendix A: Study Area

Appendix B: Agency Mailing List