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TO:	**CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON FEBRUARY 2, 2016**
FROM:	**JOHN BRAAM, P.ENG. MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER**
SUBJECT:	**BLACKFRIARS BRIDGE ENVIRONMENTAL STUDY REPORT**

RECOMMENDATION

That, on the recommendation of the Managing Director, Environmental & Engineering Services and City Engineer the following actions **BE TAKEN** in respect to the Blackfriars Bridge Environmental Assessment:

(a) The Blackfriars Bridge Environmental Study Report **BE ACCEPTED**;

(b) A Notice of Completion for the project **BE FILED** with the Municipal Clerk; and,

(c) The Environmental Study Report **BE PLACED** on public record for a 30 day review period.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

- Environment and Transportation Committee – July 9, 2007 – Blackfriars Street Community Concerns
- Environment and Transportation Committee – February 8, 2010 – Appointment of Consulting Engineers – Bridge Rehabilitation Program and Traffic Studies, Meadowlily Bridge Evaluation and Blackfriars Bridge Risk Assessment
- Environment and Transportation Committee – April 26, 2010 – Appointment of Consulting Engineers - Traffic Study - Blackfriars Bridge Risk Assessment
- Civic Works Committee - March 18, 2013 – Blackfriars Bridge Detailed Structural Inspection
- Civic Works Committee - September 9, 2013 – Blackfriars Bridge – Structural Repairs and Temporary Closure
- Civic Works Committee – May 26, 2014 – Appointment of Consulting Engineers, Blackfriars Bridge Environmental Assessment

2015 – 19 STRATEGIC PLAN

The following report supports the Strategic Plan through the strategic focus area of *Building a Sustainable City*. The Robust Infrastructure Strategy identifies the preservation of Blackfriars Bridge as a key item to manage and upgrade existing transportation infrastructure.

BACKGROUND

Purpose

This report provides Committee and Council with an overview of and seeks approval to finalize the Blackfriars Bridge Municipal Class EA. The completed Schedule 'C' Environmental Study Report (ESR) documents the EA process undertaken to determine the preferred course of action for the Blackfriars Bridge.

Background

Blackfriars Bridge spans the North Branch of the Thames River between Oxford Street and Queen Avenue as shown on Figure 1. The Blackfriars Bridge is a rare heritage asset from the City's past. It is a very unique bowstring arch structure constructed of wrought iron. The bridge has been a source of inspiration for many artists. At the venerable age of 140, it is the oldest bridge structure still in service in London and Ontario, and one of the oldest in Canada. The bridge was designated as a Heritage Structure under the Ontario Heritage Act (Part IV) on April 21, 1992. This bridge is also listed on the *Ontario Heritage Bridge List*, and it is included on the *Canadian Register of Historic Places*.

Figure 1: Site Photo

Like all municipal assets, periodic condition assessment and renewal investments are required to maintain serviceability. Recent rehabilitations of the King Street and Meadowlily historic bridges have been very well received and have been the recipient of awards.

The City undertook a detailed multi-disciplinary risk assessment of the structure in 2012 to guide future actions. A key outcome of the risk assessment was a detailed structural inspection of Blackfriars Bridge in 2013. Severe condition deterioration was identified that required the complete temporary closure of the bridge. Interim repairs were undertaken in the fall to reopen the bridge to pedestrians and cyclists for a limited timeframe (in the order of three years) until long term options could be selected. The Blackfriars EA was subsequently commenced to determine the long term future of this structure.

ENVIRONMENTAL ASSESSMENT SUMMARY

This EA has been carried out in accordance with the Schedule 'C' process of the Municipal Engineers Association (MEA), Municipal Class Environmental Assessment document (October 2000, as amended in 2007 and 2011). A copy of the Executive Summary for the ESR is contained in Appendix 'A'.

Alternatives and Evaluation

The alternative solutions studied under this EA included:

- Rehabilitate for drivers, pedestrians and cyclists;
- Rehabilitate for pedestrian and cyclists only;
- Replace for drivers, pedestrians and cyclists; and,
- Remove for storage or demolition.

The evaluations recognized:

- Its cultural importance as a significant heritage structure;
- Its role as a component of the parks pathway system;
- Its role in the transportation network (including cycling and pedestrian transportation); and,
- Its socio-economic value to the community.

The typical "do nothing" alternative is not considered a feasible alternative in this case, because the current repairs are designed as a short term, temporary fix only. By doing nothing, the decision making process for a long term solution for the bridge is only deferred until the temporary repairs reach the end of their service life.

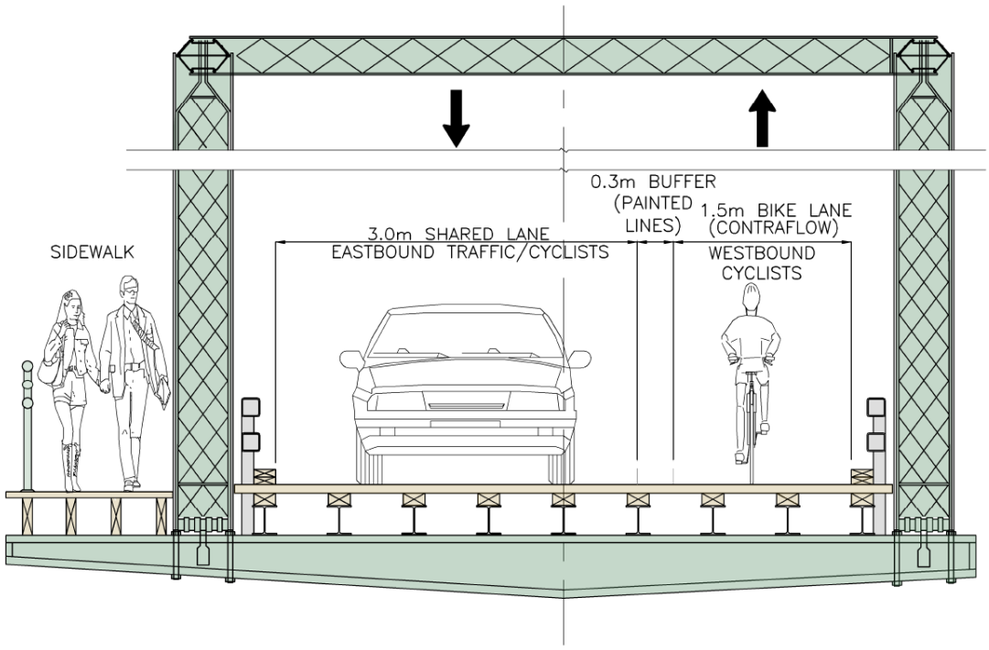
The evaluation criteria used to determine the preferred alternative included the: Cultural Heritage Significance, Transportation Environment, Socio-Economic Environment, Technical Consideration, Natural Environment and Costs Implications.

Preferred Alternative

The preferred alternative recommended through the EA process includes the rehabilitation of the heritage structure with designated future uses as illustrated on Figure 2 as follows:

- Pedestrian sidewalk and enhanced pedestrian street crossings at the ends of the bridge;
- Cycling space shared with vehicles eastbound and a dedicated cycling lane westbound; and,
- Vehicular traffic restricted to one-way eastbound.

Figure 2: Proposed Bridge Cross-Section



SECTION LOOKING WEST

Blackfriars Bridge serves Londoners as a mobility connection for motor vehicles and active transportation in addition to being a valued cultural heritage feature. The recommended alternative provides a compromise between the varied interests which allows this iconic heritage bridge to continue to serve Londoners. The EA recommends a solution that retains heritage value, improves active transportation connections, minimizes risks to bridge longevity and manages transportation network impacts.

The overall appearance of the structure will be maintained with only minor changes to the truss (top and bottom connections and cover plates) and possibly the decking, thus maintaining the heritage look and its original function as a vehicle crossing. The rehabilitation will comprise a combination of refurbishment and replacement of bridge members with replacement being predominantly limited to non-original items. The method of construction requires attention during design to protect the original wrought iron bridge and to minimize future corrosion. The installation of a durable bridge deck will eliminate the need for frequent closures for deck replacement work that has occurred in recent years.

As the work will be predominantly limited to the structure, minimal impacts to the natural environments are expected and all necessary precautions will be taken to protect those areas as necessary.

The pathways running along the banks of the river and cross the roadway at both ends of the bridge will continue to operate much as they have to date. Improvements to signage and sight lines are planned to improve these crossing points. The elimination of westbound traffic will make street crossing easier for pedestrians by reducing the traffic volume and potential conflicts.

The proposed elimination of westbound motor vehicles also reduces a major risk to the longevity of the bridge. The previous risk assessment identified that the exposure of the primary bowstring arch truss to an errant westbound vehicle travelling down the steep Ridout Street approach is a significant risk to the bridge integrity.

Maintenance of some vehicular traffic contributes to neighbourhood safety by increasing the number of “eyes on the street” and better leverages the value of the asset investment.

In addition, maintenance of some traffic on the bridge will provide more transportation network flexibility for traffic in the coming years as many projects are planned for the Downtown area, congestion is expected to increase and Thames River crossings on the west side of downtown will be constrained. Some of these projects include SHIFT Rapid Transit, Dundas Place, York Street sewer separation, expansion of the two Wharncliffe Road railway grade separations and the rehabilitation of the Thames River Kensington, Queens Avenue and Wharncliffe Road Bridges.

The restriction to westbound automobile traffic will require a reconfiguration of Ridout Street North on the east side of Thames River as shown on Figure 3 to maintain access to residences and utilities. There are private residences with driveways accessing Ridout Street north of Albert Street. Sewers, watermains and gas mains also extend to the north limit of Ridout Street and require access for normal and emergency operations. It is proposed to build a mini roundabout just north of the last Ridout Street residence. This addition will redirect north/westbound traffic on Ridout Street away from the bridge, while accommodating cyclists, snow clearing, and access for maintenance of the underground services. The road modifications will be contained within City owned lands, with a vegetative buffer being proposed for the most northerly private residence to mitigate the impacts.

Figure 3: Ridout Street Modifications

Consultation

The EA process included a public consultation process with input from relevant agencies, affected landowners, First Nations communities and members of the public. A Notice of Study Commencement was mailed out to the relevant agencies and study area property owners/residents on July 28, 2014 and an advertisement was placed in The Londoner on July 31, 2014 and August 7, 2014. A project website www.BlackfriarsBridge.ca was also established. Direct correspondence and some meetings were held with Ministry of the Environment and Climate Change, Ministry of Natural Resources, Upper Thames River Conservation Authority and the First Nation communities.

In accordance with the Schedule 'C' EA process, Public Information Centre (PIC) No. 1 was held on November 19, 2019 at the London Public Library, Central Branch. Efforts to advertise the engagement were thorough. In order to try and contact as wide an audience as possible, PIC No. 1 notices were sent to residents/property owners on November 3, 2014 and published in the Londoner on November 6 and November 13, 2014. An advertisement was also placed in the London Community News on November 13, 2014, and in the London Free Press on November 15, 2014. Notices were posted in all elevators at City Hall and mobile sign boards were erected at six locations along the commuter routes within the City. Broad use of social media feeds (Twitter, Facebook, etc), radio, TV and newsprint were all undertaken to raise awareness to as wide a spectrum of users as possible.

The first PIC was designed to present the challenges and opportunities for the Blackfriars Street crossing in order to foster discussion, ideas and feedback that would be used to chart the future course of this iconic structure for the City. A short ten minute video was created to review the history and educate attendees on the significance of this structure. 110 interested parties braved the first snow storm of 2014 and attended the PIC. In total, 237 comments were received from this engagement session. Many recognize the heritage value of this structure. Downtown automobile commuters identify the bridge as their route to and from work while many others believe it should be reduced to pedestrian and cyclists only. Comments and concerns received predominantly related to the following topics:

- Heritage/Cultural significance of Blackfriars Bridge;
- The Blackfriars Bridge is a vital connection across the Thames River for users of the Thames Valley Parkway;
- Commuter and traffic concerns related to the permanent closure of the bridge to vehicular traffic;
- Cyclist and pedestrian safety;
- Cost of the long term maintenance of the Blackfriars Bridge;
- Technical limitations of the existing bridge for sustainable, long term use; and,
- Increased neighbourhood safety and enjoyment since the closure of the bridge to vehicular traffic.

Taking the input received at PIC No. 1 into account, and factoring in the evaluation criteria (Cultural Heritage Significance, Transportation Environment, Socio-Economic Environment, Technical Consideration, Natural Environment and Costs Implications) the preferred design alternative was established. A second PIC was held on Thursday June 18, 2015 at Museum London to present the preferred design alternative to the public. Similar to PIC No. 1, a broad range of notifications were employed including mail outs to the residents on June 2, 2015, publication in The Londoner on June 4, 2015 and June 11, 2015 and the installation of mobile sign boards, at five locations. Attendance was similar to PIC No. 1 with approximately 113 attendees.

The recommended alternative as described in this report was identified at PIC No. 2. The recommended alternative balances the cultural and transportation appeal of the bridge by maintaining its heritage value while reinstating most of its previous long-term transportation function and reducing risk to the structure. This recommendation is based on a balanced approach to a number of conflicting desires and divergent opinions. The 104 comments received at or following PIC No. 2 were largely supportive of the preferred alternative. Some expressed a desire for a restriction to pedestrian and cyclists use only, while others suggested a two directional traffic be reinstated on a single lane with traffic signals controlling the operation.

The Project website tracked a total of 1,272 unique visits to the site between June 2, 2015 and July 3, 2015.

Transportation Considerations

The Thames River is a transportation network constraint on the west side of downtown. Blackfriars Bridge previously enabled approximately 4,500 vehicles per day to cross the

Thames River at this location. The directional split indicated slightly more than half the traffic used the route to travel eastbound toward downtown.

Traffic has redistributed over the various roads in the area since the bridge was closed to automobiles. Network analysis indicates that the redistribution of this traffic from Blackfriars Street to parallel routes across the Thames River impacts the capacity of Oxford Street up to 12% and Queens Avenue / Riverside Drive up to 6% in the direction influenced by the alternative. The impact on travel times is very subject to origins and destinations. Travel time benefits will be most dramatic for residents living in the immediate area. The impact on travel times across the broader network is predicted to be relatively small. Reopening the Blackfriars Bridge to one-way eastbound vehicular traffic will improve operations on Oxford Street, particularly in the morning peak when predominant movements are toward the downtown. It will also improve southbound left-turn operations slightly at the Wharncliffe Road / Oxford Street intersection.

With consideration of comments received, an analysis was also undertaken to review the feasibility of allowing two-directional traffic on the bridge, in an alternating single lane configuration, controlled by traffic signals. The cycle times required to facilitate this configuration would result in unacceptably long queue lengths extending back to Wilson Avenue and Albert Street on the west and east sides respectively. This would block residential driveways on Blackfriars Street to the west. The queue length on the east side would also be located predominantly on a steep 6.5% downgrade which presents stopping safety concerns. The 6.5% is more than double the acceptable grade approaching a stop condition.

Full Closure during Construction

The existing bridge was closed to all traffic (vehicle, pedestrian and cyclists) in September 2013 due to excessive deterioration. Following interim repairs, it was re-opened to pedestrian and cyclist traffic in December 2013. Pending Council approval, the bridge will again need to be closed to all traffic during the rehabilitation construction phase. While this is no change for vehicles, pedestrian and cyclist detours will need to be directed to Oxford Street or Queen Street for the nearest river crossing. This will add an additional 10 to 15 minutes to walking routes depending on origins and destinations.

The repairs done in 2013 required a full closure. Evidence of individuals choosing to ignore the closure signage and barricades and entering the construction site after hours during the 2013 closure was observed with one tragic result.

The project team reviewed the feasibility of providing a temporary crossing at this location for pedestrians, and cyclists during the construction phase. However, it was determined that there was no feasible site to easily construct this and estimated costs were cost prohibitive. Therefore, a temporary crossing is not recommended.

Consideration will be given to ensure necessary safety measures such as security guards or cameras are employed while this bridge is closed for construction. Pedestrian information signage will be posted.

Preliminary Cost Estimate

The estimation of construction costs is challenging given the unique nature of the work required. The preliminary estimated cost of the bridge rehabilitation is estimated to be $4.0 M. Associated road improvements and landscaping are valued at $0.6 M. The capital budget has been updated to reflect these estimated costs.

With the exception of the removal option, rehabilitation is the most economical alternative. Like all bridges, Blackfriars Bridge requires periodic rehabilitations to extend its service life. Based on Ontario Bridge Code requirements, the rehabilitation cost and scope is similar regardless of whether the future use enables vehicular traffic or is limited to pedestrians and cyclists.

CONCLUSION

A Schedule ‘C’ Municipal Class EA has been undertaken to determine future action options for the iconic Blackfriars Bridge which has spanned the North Branch of the Thames River for 140 years. An ESR has been completed and is ready for final public review. It was prepared with public and agency participation, and includes a preliminary design which provides mitigation measures for impacts associated with the bridge rehabilitation.

Blackfriars Bridge is an excellent example of cost-effective infrastructure that provides both heritage and transportation value to Londoners. With near-term investment, the bridge can continue to serve Londoners for many years to come. The EA recommended solution retains heritage value, improves active transportation connections, minimizes risks to bridge longevity and manages transportation network mobility.

Pending Council approval, a Notice of Completion will be distributed and the EA ESR will be placed on public record for a 30 day review period. Stakeholders are encouraged to provide input and comments regarding the study during this time period. Should stakeholders feel that issues have not been adequately addressed, they may provide written notification within the 30-day review period to the Minister of the Environment requesting further consideration.

If no requests for a Part II Order are received, the project will be in a position to move forward to detailed design and construction in accordance with the recommendations of the study.

Construction can begin in 2017 subject to EA approval and Council approval of the Capital Budget. There is the potential for some work such as coating to be deferred to the following year based on weather requirements.

Acknowledgements

This report was prepared with assistance from Jane Fullick, C.E.T., Technologist II, Karl Grabowski, P. Eng., Transportation Design Engineer of the Transportation Planning and Design Division.

PREPARED BY:	**REVIEWED & CONCURRED BY:**
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RECOMMENDED BY: **JOHN BRAAM, P. ENG.** **MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER**	

Attach: Appendix “A” – Environmental Study Report Executive Summary

c: C. Haines, Dillon Consulting Limited
Transportation Advisory Committee
London Advisory Committee on Heritage

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APPENDIX A

Environmental Study Report Executive Summary

Executive Summary

Introduction

Erected in 1875, Blackfriars Bridge is one of the oldest and rarest bridges in Canada. The bridge spans the north branch of the Thames River, connecting Ridout Street to Blackfriars Street in the City of London (City). It also provides pedestrians and cyclists a connection between segments of the Thames Valley Parkway (TVP) located along the banks of the river.

The bridge was designated as a heritage structure under Part IV of the *Ontario Heritage Act* on April 21, 1992. In addition, it is listed on the *Ontario Heritage Bridge List* and is included on the *Canadian Register of Historic Places*. There are only nineteen Wrought Iron Bridge Company (WIBC) bowstring arch-trusses remaining in the United States and Canada. Of these, ten are closed, abandoned or stored in a warehouse; five have been converted to pedestrian use, and three are open to one-way vehicular traffic. As of 2013, Blackfriars was the only such bridge carrying two-way vehicular traffic.

Dillon Consulting Limited (Dillon) was retained by the City to complete a Schedule C Class Environmental Assessment (EA) study to determine the future requirements of the river crossing at Blackfriars Street, including rehabilitation, replacement, or removal of the existing bridge, recognizing its:

- Importance as a significant heritage structure
- Role as a component of the parks and pathway system
- Role in the transportation network (including cycling and pedestrian transportation)
- Socio-economic value to the community.

“Do Nothing” was not considered feasible since the current repairs are short term only, leaving the same decision to be made when the repairs have expired.

Alternative Solutions

Four alternative solutions for Blackfriars Bridge were considered including:

1. REHABILITATE BRIDGE – Driver, Pedestrian and Cyclist Use. Options include:
    - Two-way driving traffic
    - One-way driving traffic.

2. REHABILITATE BRIDGE – Pedestrian and Cyclist Use.

3. REPLACE BRIDGE – Driver, Pedestrian and Cyclist Use. Options include:
    - Connection to Ridout Street
    - Connection to Central Avenue.

4. REMOVE BRIDGE (storage or demolition) – Options include:
    - Leave abutments in place (assumed)
    - Remove abutments and restore banks.

Alternative solutions were assessed on the basis of a comprehensive set of factors and criteria that reflected the following considerations:

- Provincial and federal government legislation, policies and guidelines
- Municipal policies
- Existing and future natural, socio-economic, cultural and engineering conditions within the Study Area
- Issues and concerns identified during consultation with ministries, agencies, interest groups and the general public
- Project Team investigations, risks and expertise.

Traffic Assessment

A traffic assessment was completed, and revealed that by re-distributing traffic from the Blackfriars Bridge, adjacent intersections would experience differing degrees of operational issues during peak hours, with few locations over capacity. With some fine-tuning of the system, it was determined that most intersections in the Study Area could operate within capacity.

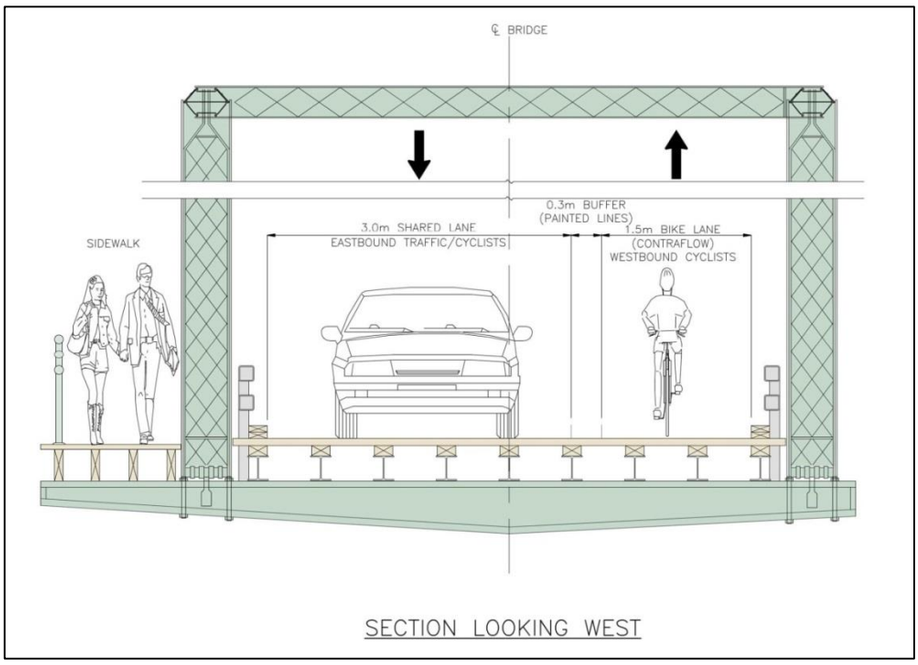
A separate analysis was completed to consider the feasibility of allowing two-way traffic across the bridge in a single lane configuration using traffic signals. This result of the analysis revealed significant issues related to cycle times and the resulting queue lengths. On Blackfriars Street, the queues were found to extend past the Napier Street intersection and often could extend through the Wilson Avenue intersection, and block entrances. On Ridout Street, the queue would extend nearly to the intersection with Albert Street, resulting in traffic stopping on a 6.5% grade for most of the queue length, which is more than double the acceptable grade for a stop condition, raising significant safety concerns.

Preferred Design

Based on the assessment of alternatives and comments received during the EA, the project team concluded that rehabilitating Blackfriars Bridge for drivers (eastbound only), pedestrians and cyclists was the preferred alternative. While public feedback from PIC #1 suggested eliminating drivers, the retention of some driving usage has utility benefits to the driving network, while maintaining the pedestrian and cyclist crossing functionality, with similar construction costs. The preferred alternative includes:

- 3.0 m wide traffic lane (one way eastbound)
- Eastbound cyclists share the traffic lane (single file) on the bridge, with a transition to a dedicated cycling lane on approaches
- Westbound cyclists are accommodated on a dedicated cycling lane, separated with a painted line (yellow)

- Pedestrians are accommodated on sidewalk.



CROSS SECTION OF PREFERRED ALTERNATIVE

Bridge Rehabilitation Details

In general, the rehabilitation of the bridge will require strengthening or replacement of key structural elements, as well as significant work on the connections. The details of the rehabilitation will be guided by the findings of the 2013 Structural Evaluation, and finalized during detailed design.

A priority will be placed on minimizing the replacement of members to only those cases where rehabilitation would not achieve the required level of performance. Most of the elements to be replaced are not from the original construction, but from past rehabilitation projects completed in 1951 or 1986. Generally, replacement members will be fabricated to appear similar to existing or original members, to maintain the aesthetic appearance of the bridge.

The following rehabilitation work on the bridge itself is anticipated:

- Replacement of cover plates on top chord arches
- Strengthening of top chord riveted connections
- Modification to top chord hanger and diagonal connection details
- Strengthening of vertical and diagonal truss members (approximately 15% of original members requiring replacement)
- Replacement of longitudinal stringers (from 1986 rehabilitation)
- Replacement of transverse floor beams (original 1875 construction)
- Modifications to lower panel point connections (below the deck)
- Replacement of bottom lateral bracing (from 1986 rehabilitation)
- Repairs to top lateral bracing system
- Repairs to pedestrian railing at sidewalk
- Rehabilitation of bridge bearings

- Repainting of the bridge
- Replacement of the wood deck with a more durable wood or alternative material.

All primary members on the bridge will be repaired by bolting or riveting rather than welding. Welding of wrought iron presents significant risk of cracking of the welds due to nonmetallic components of the wrought iron, which can lead to brittle behaviour and cracking of welds. Welding of noncritical details may be undertaken to preserve aesthetics.

The substructure of the bridge has been rehabilitated over the years and is considered in generally good condition. Aside from minor modifications in the bearing areas, no work is planned for the substructure.

The resulting bridge will maintain the same overall appearance as it appeared prior to 2013, and will continue to have a posted weight limit for vehicles.

Approach Road Changes

To accommodate the eastbound-only traffic configuration, some modifications will be required on the approach roads.

Few changes will be required on Blackfriars Street, aside from line painting and signage at the transition to one-way traffic (and to accommodate cyclists). One private entrance is affected, and the two-way portion of the street will extend to include this location.

A roundabout was recommended at Ridout Street as part of the preferred design to facilitate westbound drivers turning around (to avoid the one-way bridge crossing) and snow removal operations. Traffic calming may be considered, to reduce operating speeds in the vicinity of the bridge. This would not only reduce the risk of collisions with pedestrians and cyclists, but also with the bridge itself, and with other vehicles at the transition to two-way traffic on Ridout Street. Addition of a clearance beam west of the bridge will also be considered to prevent oversize vehicles from colliding with the top bracing of the bridge.

Pedestrian and Cyclist Accommodation

A key feature of the recommended one-way (eastbound) configuration for drivers is the continued accommodation of two-way cyclist traffic. To accomplish this:

- Eastbound cyclists will follow a “share the road” configuration, with single-file traffic across the bridge itself
- Westbound cyclists will be provided with a separate lane on the bridge since the direction of travel for these cyclists will be opposite to the direction for vehicles. The lane configuration will be in compliance with the Ontario Traffic Manual Book 18.

The pathway systems running along the banks of the river which cross the roadway at both ends of the bridge will continue to operate much as they have to date. However, improvements in signage and sight lines are planned.

Pedestrians will continue to be accommodated on the bridge by using the sidewalk. Widening of the sidewalk to meet *Accessibility for Ontarians with Disabilities Act* (AODA) will be investigated during detailed design.

Preliminary Cost Estimate

The preliminary estimated cost of the bridge rehabilitation is estimated to be $4.0 M. Associated road improvements and landscaping are valued at $0.6 M.

Public and Agency Consultation

Public involvement is a key component in the development and completion of Class EAs. Local knowledge, issues, concerns and suggestions provide invaluable information for the process, and ultimately, the completion of this study with the best possible solution.

The following methods for consulting the public were used throughout the study:

- Project notices mailed to the project contact list
- Two Public Information Centres (PICs)
- Three Technical Agency Committee (TAC) meetings
- Project website – www.blackfriarsbridge.ca
- Email updates to those that provided email addresses
- Social media (via City Communications).

Generally, comments and concerns received related to:

- Maintaining and protecting the heritage/cultural significance of the Blackfriars Bridge
- Commuter and traffic concerns related to the permanent closure of the bridge to vehicular traffic
- Ensuring cyclist and pedestrian safety
- Maintenance costs of the Blackfriars Bridge over the long term
- Maintaining the vital connection across the Thames River for the TVP
- Technical limitations of the existing bridge for sustainable, long term uses
- Neighbourhood enjoyment since the closure of Blackfriars Bridge to vehicular traffic
- Commercial business impacts and maintaining a connection to downtown.

Based on the assessment of alternatives and comments received during the Notice of Commencement period, and from PICs #1 and #2, the project team concluded that rehabilitating Blackfriars Bridge for drivers, pedestrians and cyclists was the preferred alternative. While public feedback from PIC #1 suggested eliminating drivers, the retention of some driving usage has utility benefits to the driving network, while maintaining the pedestrian and cyclist crossing functionality, with similar construction costs.

Environmental Impacts and Mitigation

Many of the environmental impacts and concerns related to the project have been mitigated through the process by which the preferred alternative was selected, as described in this Environmental Study Report (ESR). The remaining anticipated impacts to the natural, socio-economic and cultural environments and the proposed mitigation measures for the preferred design are described in **Section 6.0** of this ESR.

Natural Environment

A scoped Environmental Impact Study (EIS) within the Study Area was completed as part of this EA. It is expected that the rehabilitation will have minimal impacts to natural features/vegetation. In-water works are not anticipated. There may be limited impacts to a small portion of the green lands located southeast of the bridge off Ridout Street to facilitate construction of new road infrastructure to transition one-way traffic into two-way traffic.

Property Impacts

The preferred alternative results in some minor aesthetic impacts to property located east of Blackfriars Bridge at the foot of Ridout Street due to the roundabout. A vegetation buffer is proposed south of the roundabout to provide some privacy and to mitigate potential headlight intrusion to the house as vehicles navigate the roundabout.

Noise and Vibration

Construction noise and vibration impacts are temporary in nature, but will be noticeable at times. The municipal by-law hours of construction operation will be adhered to. Operational noise impacts resulting from the Blackfriars Bridge rehabilitation will be minimal, and mitigation is not required. The replacement of the bridge deck with alternative materials may provide some noise mitigation relating to a reduction in board movements.

Residents in the Blackfriars community expressed concerns relating to an increase in traffic volumes and speed of vehicles, thereby noise levels. A potential reduction of vehicle speeding is anticipated due the installation of a clearance beam for oversized loads, the crosswalk/cross ride and roundabout features.

Reduced Access for Pedestrian/Cyclists during Construction

During construction, the bridge **will be closed to all public users** including pedestrians and cyclists until construction is complete. This results in increased travel time of about 11 minutes by foot and four minutes for cyclists (north or south). A security guard may be required in off hours to keep the public off the construction site.

Aesthetics

The overall appearance of the Blackfriars Bridge will be maintained with some changes to the appearance of the truss (top and bottom connections, cover plates). There will be modest changes to the sidewalk railing (to preserve aesthetics where possible). The appearance and materials of the deck may potentially change.

Navigation

Navigation of the Thames River will not be impacted by rehabilitation activities.

Cultural Environment

The area to be impacted by construction activities is limited to previously disturbed areas; therefore, there are no anticipated impacts to archaeological resources. The preferred alternative retains the overall appearance of the heritage structure. Some changes to the appearance of connections is required, although these changes will not be recognizable to general public. The deck could be constructed of wood, similar to original deck, though alternate deck types may also be considered to reduce maintenance costs and disruption to vehicular traffic. The preferred alternative also retains the original function as a vehicle crossing.

Original bridge builder (WIBC) signs were previously attached to the lateral truss bracing at either end of the bridge. The WIBC signs will be replicated and reinstated as part of the aesthetic and cultural heritage improvements.

The original Ontario Heritage Trust sign located near the bridge was damaged by a vehicle some time ago. The City will reinstate a replacement sign as part of the rehabilitation work.