

Municipality of Chatham-Kent
Infrastructure and Engineering Services
Engineering and Transportation Division

To: Mayor and Members of Council
From: Chris Thibert, P.Eng.
Director, Engineering
Date: October 26, 2020
Subject: Conversion of Movable Bridges – Community of Wallaceburg

Recommendations

It is recommended that:

1. Administration proceed with a Request for Proposal (RFP) to hire a consultant estimated at \$150,000 to lead community consultation and an investigation through Transport Canada (under the Canadian Navigable Waters Act) to explore options to convert the Dundas Street Bridge as well as the Murray Street Bridge into fixed (non-movable) structures prior to any significant rehabilitation works on these bridges in the future.

Background

As per the recommendation in the Report to Council titled “Council’s Growth and Recovery Next Steps” which was approved at the October 19, 2020 Council meeting:

“That Council accept the Growth and Recovery Strategy next steps as presented in the Growth and Recovery Strategy Next Steps Gantt Chart.”

- Item 23 of the Gantt Chart depicts “Bridges/Culverts matrix – RTC”

This report is being written to provide recommendations for consideration from an internal bridge review in support of the Growth and Recovery Strategy which is also in line with the 2018-2022 Council Term Priorities under “Growth - Rationalize current inventory of bridges, roads, parks and buildings in support of new infrastructure investment”.

Council, at their regular meeting on April 27, 2020, approved the Base Line Bridge tender report for Contract T19-417 as follows (Appendix A):

1. The tender for contract T19-417 Structural and Mechanical Rehabilitation of the Base Line Bridge over Sydenham River, Community of Wallaceburg be awarded to the lowest bidder, Landform Civil Infrastructures Inc. of Hamilton Ontario, at a

value not to exceed \$2,196,194 (including HST), subject to the negotiation of an agreement satisfactory to the Chief Legal Officer and the General Manager, Infrastructure and Engineering Services.

2. If successful with recommendation “1” above, the Mayor and Clerk be authorized to enter into the recommended agreements of awarding contract T19-417 to Landform Civil Infrastructures Inc. of Hamilton Ontario.
3. If unsuccessful with recommendation “1” above, administration proceed with cancelling contract T19-417; the Structural and Mechanical Rehabilitation of the Base Line Bridge over the Sydenham River, Community of Wallaceburg and proceed with two separate tenders for the required structural work and mechanical work.

Recommendation #4 in the report was approved as amended as follows:

“I move that recommendation #4 be separated from the original motion, and sent back to staff for more information. Furthermore, before coming back to Council with a report on the possibility of launching an investigation into movable bridges, staff will setup a meeting with Transport Canada to discuss the Navigable Waters Act and how it applies to Wallaceburg and Chatham-Kent overall. This report will also include details related to the decision making process behind changing the community of Chatham’s movable bridges to fixed bridges. Specific consultation and discussions with Walpole Island First Nation and the St. Clair Region Conservation Authority must be included in any future investigation. And, lastly any future investigation and consultation will focus on all movable bridges in Chatham-Kent.”

Financial Challenges of Movable Bridges

There are 36 known movable bridges remaining in Canada, of which 6 are located in Wallaceburg. Five of these bridges are municipally owned and one is privately owned. Communities across Canada have been converting movable bridges to fixed bridges for the following reasons:

- a) Capital costs of movable bridges are typically two times that of a fixed bridge of similar dimensions.
- b) Movable bridges are complex structures, requiring specialized contractor expertise, which serves to drive up repair and construction costs.
- c) There is limited competition amongst specialized contractors to bid on repair work, resulting in higher pricing.
- d) 2 of the 5 movable bridges in Wallaceburg require rehabilitation in the next 5 years.
- e) In addition to staff requirements to open and close the bridges after regular business hours, on-going maintenance costs are significant to ensure bridge operations are maintained.

In Chatham, all four movable bridges over the Thames River have been converted to fixed (non-movable) bridges.

The current owner of the movable railway bridge in Wallaceburg will also be faced with these financial challenges.

Comments

As part of the Base Line Bridge tender award through Council, a Public Information Centre (PIC) was held on Wednesday February 19, 2020 at the Wallaceburg Service Center. The theme of the meeting was “Similar Service...In a Different Way...Within Budget.” Public input was sought to examine opportunities to be creative and achieve savings. Approximately 90 people attended the PIC. A number of slides were presented that highlighted navigational clearances below all of the movable bridges in Wallaceburg, financial information, usage statistics and potential alternative solutions.

Further details as well as the results of the PIC are contained within the report to Council dated April 20/20.

Members of the public suggested at the PIC the potential to convert the Murray Street Bridge and Dundas Bridges to non-movable due to their low usage and the northern position along the river. It was recommended that administration further explore these opportunities prior to any planned rehabilitation works in the future.

Process to Convert from Movable to Fixed

Per the approved motion, administration has contacted Transport Canada to discuss the Navigable Waters Act and how it applies to Wallaceburg and Chatham-Kent overall. The only remaining movable bridges owned by the Municipality (5 in total) reside in Wallaceburg.

To convert any of the bridges along the Sydenham River from a movable to a fixed structure requires administration to follow a process which includes close consultation with Transport Canada (in accordance with the Navigable Waters Act). This process is similar to that of a Municipal Class Environmental Assessment (EA) where the Municipality will be required to evaluate all options and present recommendations to the public that will be posted on Transport Canada’s website for comments and feedback.

This public consultation process will also include consultation with the following parties as mandated through the Navigable Waters Act:

- Members of the public
- Local Conservation Authorities
- Transport Canada (Navigable Waters)
- First Nations Ontario

The approximate timelines to complete this consultation is one (1) year. Based on the comments and feedback received, Transport Canada will provide their position either in support or against the conversion of the structure from movable to fixed. If Transport Canada is in support of this conversion, administration will proceed with a report to Council recommending the conversion of the bridge(s) for Council’s consideration. If

Transport Canada is against this conversion, then the process halts and the Municipality will proceed to maintain the bridge(s) as movable structures.

Areas of Strategic Focus and Critical Success Factors

The recommendation in this report supports the following areas of strategic focus:

- Economic Prosperity:
Chatham-Kent is an innovative and thriving community with a diversified economy
- A Healthy and Safe Community: Chatham-Kent is a healthy and safe community with sustainable population growth
- People and Culture:
Chatham-Kent is recognized as a culturally vibrant, dynamic, and creative community
- Environmental Sustainability:
Chatham-Kent is a community that is environmentally sustainable and promotes stewardship of our natural resources

The recommendation in this report supports the following critical success factors:

- Financial Sustainability:
The Corporation of the Municipality of Chatham-Kent is financially sustainable
- Open, Transparent and Effective Governance:
The Corporation of the Municipality of Chatham-Kent is open, transparent and effectively governed with efficient and bold, visionary leadership
- Has the potential to support all areas of strategic focus & critical success factors
- Neutral issues (does not support negatively or positively)

Consultation

There were no other departments consulted on the preparation of this report.

Financial Implications

Annual lifecycle savings of approximately \$1,100,000 are possible if all bridges in Wallaceburg are converted to non-movable. These savings consist of labour and maintenance savings as the bridge will no longer require support staff and on-going repairs related to movements.

As only the Dundas Street Bridge and the Murray Street Bridge are being considered at this time as non-movable, the lifecycle savings are conservatively estimated at \$385,000 per year based on 2020 costs.

It is recommended that a consultant be hired to manage the required process at an estimated cost of \$150,000. A Request for Proposal (RFP) will be issued and brought back to Council for final approval.

Prepared by:

Chris Thibert, P.Eng.
Director, Engineering,
Engineering and Transportation

Reviewed by:

Thomas Kelly, P.Eng., MBA
General Manager
Infrastructure and Engineering Services

Attachments: Appendix A - Contract Award T19-417: Structural and Mechanical Rehabilitation – Base Line Bridge over the Sydenham River)

(RTC:\Infrastructure & Engineering\I&ES\2020\4299 – Conversion of Movable Bridges – Community of Wallaceburg

Municipality of Chatham-Kent
Infrastructure and Engineering Services
Engineering and Transportation Division

To: Mayor and Members of Council

From: Chris Thibert, P.Eng.
Director, Engineering & Transportation

Date: April 16, 2020

Subject: Tender Award: Contract T19-417 Structural and Mechanical Rehabilitation of the Base Line Bridge over Sydenham River, Community of Wallaceburg

Recommendations

It is recommended that:

1. The tender for contract T19-417 Structural and Mechanical Rehabilitation of the Base Line Bridge over Sydenham River, Community of Wallaceburg be awarded to the lowest bidder, Landform Civil Infrastructures Inc. of Hamilton Ontario, at a value not to exceed \$2,196,194 (including HST), subject to the negotiation of an agreement satisfactory to the Chief Legal Officer and the General Manager, Infrastructure and Engineering Services.
2. If successful with recommendation "1" above, the Mayor and Clerk be authorized to enter into the recommended agreements of awarding contract T19-417 to Landform Civil Infrastructures Inc. of Hamilton Ontario.
3. If unsuccessful with recommendation "1" above, administration proceed with cancelling contract T19-417; the Structural and Mechanical Rehabilitation of the Base Line Bridge over the Sydenham River, Community of Wallaceburg and proceed with two separate tenders for the required structural work and mechanical work.
4. To offset the budgetary challenges associated with the Base Line Bridge and movable bridges in general, administration proceed with a community consultation and an investigation through Transport Canada (under the Canadian Navigable Waters Act) to explore options to convert the Dundas Street Bridge as well as the Murray Street Bridge into fixed (non-movable) structures prior to any significant rehabilitation works on these bridges in the future. Converting to fixed bridges will result in an estimated annual lifecycle savings of \$500,000 but would also result in restricted upstream access.

Background

The Base Line bridge was built in 1994, has an east-west orientation, and is located on Base Line 0.28 km east of Old Glass Road in the Community of Wallaceburg. This swing bridge carries two lanes of predominantly vehicular traffic across the Sydenham River in three non-continuous spans, with a total crossing length of 118.85 m and a maximum navigable clearance of 3.3 m. The deck has a travelled width of 8.5 m and an overall width of 13.95 m.

This road has an Average Annual Daily Traffic volume (AADT) of 5,600 and the speed limit at this location is 50 km/hr.

Bi-annual inspections have been conducted by the Municipality of Chatham-Kent (as legislated under the *Public Transportation and Highway Improvement Act*) to continually monitor the condition of the structures and to ensure public safety. All structures form part of the comprehensive 20 Year Plan managed by the Engineering and Transportation Division.

Over the past few years, there were a number of occurrences whereby the Base Line Bridge became fixed in the open position while allowing marine traffic to pass. Once opened, it was not able to close to allow vehicular traffic to pass. This was a result of faulty sensors and the inability to override the bridge programming to force the system to close the bridge. This resulted in an approximate 4 to 5 hour delay whereby no vehicular traffic could use the bridge.

To resolve the vehicular traffic issue, in 2019 Chatham-Kent Public Works staff had to set up an emergency detour consisting of Murray Street Bridge, Margaret Avenue, Fork Street, Wellington Street and Dufferin Avenue due to the load posting of Lord Selkirk bridge. This is not the preferred option as these road segments were not intended for heavy truck traffic.

To resolve the bridge open/close issue, two (2) contractors had to mobilize to the site. The first contractor had to provide boat transportation for the second contractor to access the center pier located in the Sydenham River. The second contractor had to climb the ladder attached to the center pier to be able to directly connect a laptop to the system. Once connected, a computer program was used to override the system to allow the bridge to be closed. This process had become more difficult to perform as contractors were reluctant to use a boat to access the center pier to override the system.

On February 8, 2018, tender T18-160 was let for the mechanical and electrical rehabilitation of the Base Line Bridge. The tender closed on March 8, 2018 and the Purchasing Officer did not receive any bids.

As a result of not receiving any bids for the mechanical and electrical rehabilitation tender T18-160; the tender was not awarded and cancelled. Due to the fact that the electrical issues were a large part of the operational issues; it was decided that the electrical portion of the unsuccessful tender T18-160 was to become a stand-alone

single source contract. According to the requirements of Procurement By-law #03-2016; in October 2018, a single source contract was awarded and approved by Council for only the electrical rehabilitation of the Base Line Bridge. As per the contract, the work was completed in 2019.

The electrical rehabilitation was completed to the Base Line Bridge whereby remote systems were installed in the bridge control tower to access and override the programming if faulty sensors became the nature of the operation issue. The programmable logic controller (PLC) responsible for operation of the bridge was also replaced.

The mechanical rehabilitation of the cancelled 2018 tender is still required as faulty sensors and other mechanical components are now the root causes of issues associated with bridge operation. In addition, structural issues have since been identified that are necessary to extend the life of the structure. Details include:

Mechanical:

- Faulty sensors malfunctioning during bridge operations; replacement parts are difficult to find
- Deteriorated hydraulic components including cylinders
- Slight wearing of bearings
- Deteriorated tail lock

Structural:

- Fatigued structural steel supporting sidewalks
- Rutted and deteriorated asphalt wearing surface on approach spans and swing span.
- Deteriorated and spalled concrete sidewalks, curbs, deck, abutments and pier
- Deteriorated coatings on steel sidewalks
- Deteriorated and misaligned deck drains



Figure 1. Base Line over Sydenham River

Comments

The tender was let on December 19, 2019 and the Purchasing Officer received and opened tenders for the work on January 23, 2020. The tender allowed for the structure to remain a movable bridge allowing for both vehicular/pedestrian traffic above as well as marine traffic below.

This rehabilitation, in combination with the electrical rehabilitation completed in 2019, will provide approximately 30-35 years of service.

The tender results are as follows:

Bidder	Location	Bid (including HST)
Landform Civil Infrastructures Inc.	Hamilton, ON	\$ 2,888,675.50
Facca Inc.	Ruscom, ON	\$ 3,915,450.00

The original Engineer's estimate for the project was \$1,764,890 (including HST) but upon further review of the two bids submitted for the project, the Engineer's estimate was revised to \$1,996,540 (including HST). Based on this adjustment, the tender amount over budget was reduced from \$1,123,786 to \$892,136. Rationale for this revision was due to the complexity of site access and access to do the works required under the contract. As the structural components of this contract consist of cantilevered sidewalk repairs over a large span, additional equipment is required to ensure safe access to perform the required works.

Per the terms of the tendered contract, work may commence any time after Council Award with a substantial completion date of August 4, 2020. With the recent delay in the award and the Covid-19 crisis, the completion date will need to be revised and negotiated.

The bridge will be closed to vehicular traffic for the duration of the project estimated to be 4 to 5 months. A detour will be in place for the duration of the project comprising of: McNaughton Avenue, Dufferin Avenue, Arnold Street, Mason Street, and Old Glass Road.

Marine traffic will be maintained throughout the majority of the project, with possible isolated reductions with prior notification. If there are unforeseen project delays, the contractor is required to provide full marine access for WAMBO. This condition may also require revision based on the current Covid-19 emergency.

Financial Challenges of Movable Bridges

There are 36 known movable bridges remaining in Canada, of which 6 are located in Wallaceburg. Communities across Canada have been converting movable bridges to fixed bridges for the following reasons:

- a) Capital costs of movable bridges are typically two times that of a fixed bridge of similar dimensions.

- b) Movable bridges are complex structures, requiring specialized contractor expertise, which serves to drive up repair and construction costs.
- c) There is limited competition amongst specialized contractors to bid on repair work resulting in higher pricing.
- d) 4 of the 5 movable bridges in Wallaceburg require rehabilitation in the next 5 years.

In Chatham, all four movable bridges have been converted to fixed (non-movable) bridges.

The current owner of the movable railway bridge in Wallaceburg will also be faced with these financial challenges.

Public Information Centre (PIC)

Due to the over budget condition, a Public Information Centre (PIC) was held on Wednesday February 19, 2020 at the Wallaceburg Service Center. The theme of the meeting was “Similar Service...In a Different Way...Within Budget.” Public input was sought to examine opportunities to be creative and achieve savings. Approximately 90 people attended the PIC. A number of slides were presented that highlighted navigational clearances below all of the movable bridges in Wallaceburg, financial information, usage statistics and potential alternative solutions. A copy of the slides provided at the PIC are shown in Appendix A.

As presented in the slides at the PIC, the average number of boats requesting a bridge opening along the Sydenham is 39 per year:

- 45 openings in 2016 with 23 dedicated to WAMBO
- 46 openings in 2017 with 25 dedicated to WAMBO
- 23 openings in 2018 with 17 dedicated to WAMBO
- 41 openings in 2019 with 19 dedicated to WAMBO

An on-line survey was hosted on the Chatham-Kent website from February 18, 2020 through to February 24, 2020. A paper copy of the on-line survey was also provided at the PIC. Approximately 900 surveys were completed. The results of the survey is shown in Appendix B. Key takeaways from the survey include:

- 80% of respondents were residents of Wallaceburg
- 64% who completed the survey owned a boat or enjoyed boating along the Sydenham River
- 30% (254 in total) required movable bridges (note that actual usage is 39 per year); 70% did not require movable bridges or stated the question was not applicable
- Bridges located in the south of the chain (Baseline, Railway Bridge and Lord Selkirk Bridge) received the highest amount of support for movable functionality; Murray St. Bridge and Dundas Bridge received the lowest support for movable functionality

- 73% of respondents favoured investment in bridges compared to other community investment alternatives
- 32% of respondents supported the concept that specialized and unique service levels should be paid for by the benefitting community; 68% did not support this concept

Chatham-Kent received approximately 40 emails as well as social media comments (in addition to the on-line surveys) from residents expressing their concerns and comments.

Overall, the majority of public support the rehabilitation of the Base Line Bridge as a movable bridge. The four main themes/comments people provided from the surveys, PIC, emails, and social media were:

- Boating for recreation and tourism is an important economic driver for the Community of Wallaceburg. The ability to dock personal boats and watercraft is an also an important ask of the community.
- Access for seawall repairs is required in order to maintain properties. The barges that are used to repair the seawalls will need movable bridges to permit passage under the bridges and gain access to various seawalls along the Sydenham River.
- Ice Breakers are required to reduce flooding that may occur in the future.
- The conversion to fixed (non-movable) structures may be feasible for the Dundas Street Bridge and Murray Street Bridges and savings will help offset budget challenges and preserve the movable bridged that lead to the downtown core from the south.

Regarding the seawall repair comment, administration confirmed that the barges typically used in Wallaceburg for seawall repair are stationed in the river north of the Baseline Bridge but do require passage below the Base Line Bridge occasionally for site access. However, further investigation revealed the following:

- Portable barges are available for hire that can be brought in via boat launches.
- Barges are able to pass under the bridges without the need for opening and load the required equipment at the various boat launches.

Regarding ice breakers, administration received correspondence from the St. Clair Region Conservation Authority (SCRCA) expressing consideration to maintain access for ice breakers. Administration confirmed that ice breakers within the Sydenham River have been used once in the last 29 years. To reduce liability, it has been the trend of most municipalities to allow “nature to take its course” when ice jams occur. The use of ice breakers is not recommended as the impending adverse effects of such action then lies solely with the Municipality.

Members of the public did suggest at the PIC the potential to convert the Murray Street Bridge and Dundas Bridges to non-movable due to their low usage and the northern position along the river. It was recommended that administration further explore these opportunities prior to any planned rehabilitation works in the future. Future consultation will be similar to a Municipal Class Environmental Assessment (EA) and will include:

- Members of the public
- Transport Canada (Navigable Waters)
- First Nations Ontario
- Council

A representative from Walpole Island First Nations attended the PIC and requested further discussion if any changes to the bridge are planned. Administration will continue to work closely with Walpole First Nations to ensure their comments and concerns are addressed.

Potential Savings

Savings of approx. \$1.0 million in up-front capital are possible if the Base Line Bridge is converted from a movable structure to a fixed (non-movable) structure. In addition to the up-front savings, annual savings of \$1,114,322 are possible if all bridges in Wallaceburg are converted to non-movable. These savings consist of labour and maintenance savings as the bridge will no longer require support staff and on-going repairs related to movements.

If only the Dundas Street Bridge and the Murray Street Bridge are to be considered in the future as non-movable, the annual savings would go from \$1,114,322 to approximately \$500,000.

Options to Consider

1. Administration negotiate with the lowest bidder and seek agreement to 10% of the Engineer's estimate which equates to \$2,196,194 (including HST) for the work associated with contract T19-417; the Structural and Mechanical Rehabilitation of the Base Line Bridge over the Sydenham River, Community of Wallaceburg.
2. Administration proceed with cancelling contract T19-417; the Structural and Mechanical Rehabilitation of the Base Line Bridge over the Sydenham River, Community of Wallaceburg and proceed with two separate tenders for the required structural work and mechanical work.
3. Accept the tender in the amount of \$2,888,675.50 (including HST) for the work associated with contract T19-417; the Structural and Mechanical Rehabilitation of the Base Line Bridge over the Sydenham River, Community of Wallaceburg. Council direction will be required to define a funding source of \$892,136 to address the over budget condition.

Areas of Strategic Focus and Critical Success Factors

The recommendations in this report support the following areas of strategic focus:

- Economic Prosperity:
Chatham-Kent is an innovative and thriving community with a diversified economy
- A Healthy and Safe Community: Chatham-Kent is a healthy and safe community with sustainable population growth
- People and Culture:
Chatham-Kent is recognized as a culturally vibrant, dynamic, and creative community
- Environmental Sustainability:
Chatham-Kent is a community that is environmentally sustainable and promotes stewardship of our natural resources

The recommendations in this report support the following critical success factors:

- Financial Sustainability:
The Corporation of the Municipality of Chatham-Kent is financially sustainable
- Open, Transparent and Effective Governance:
The Corporation of the Municipality of Chatham-Kent is open, transparent and effectively governed with efficient and bold, visionary leadership
- Has the potential to support all areas of strategic focus & critical success factors
- Neutral issues (does not support negatively or positively)

Consultation

The tenders were opened by the Purchasing Officer and reviewed by the Engineering and Transportation Division, Infrastructure and Engineering Services and by AECOM Canada Ltd. (Letter of Recommendation attached as Appendix C)

Financial Implications

Project fees associated with this contract will be funded as summarized in the following table:

Financial Implications
Structural and Mechanical Rehabilitation – Base Line Bridge over the Sydenham River
Project Costs

Recommended Tender ^A (Including HST)	\$ 2,888,675.50
Less HST Rebate 11.24%	-\$ 287,333.74
Total Current Project Costs	\$ 2,601,341.76
Total Current Project Funding	\$1,996,540.00
Budget Shortfall	\$892,136.00

Note A: Provisional Items are carried in this contract as a total of \$447,350 and is accounted for in the recommended tender. Contingency is carried in this contract as a total of \$200,000 and is accounted for in the recommended tender.

The “Total Current Project Costs” amount listed above will be funded from the Bridge Lifecycle Reserve, which includes funds under the Association of Municipalities of Ontario (AMO) Federal Transfers of Federal Gas Tax Funding Agreement.

Prepared by:

Reviewed by:

Jason Cikatricis, C.E.T.
Engineering Technologist,
Engineering and Transportation

Chris Thibert, P.Eng.
Director,
Engineering and Transportation

Reviewed by:

Thomas Kelly, P.Eng., MBA
General Manager
Infrastructure and Engineering Services

Consulted and confirmed the content of the consultation section of the report by:

Jennifer Scherle
Purchasing Officer

Attachments: Appendix A - PIC presentation slides
 Appendix B - Survey Results
 Appendix C - Consultant's Letter of Recommendation

(RTC:\Infrastructure & Engineering\I&ES\2020\4208 – Contract Award T19-417:
Structural and Mechanical Rehabilitation – Base Line Bridge over the Sydenham River)