

Combination Utility/Active Transportation Bridge Opportunity

ISSUE

A sanitary sewer river crossing is required to connect the Wastewater Treatment Plant to the future neighbourhoods in the University Heights development area. During the planning of this river crossing, the opportunity of building a combination utility/active transportation bridge has been identified, which provides significant savings when compared to building independent facilities. At the appropriate time, direction from City Council will be required to advance, or forgo, this opportunity.

BACKGROUND

In September 2015, the Sanitary River Crossing Feasibility Study was completed that explored potential crossing locations and methods to provide the required service to developable areas in the northeast quadrant of the city. The executive summary of this study is included in Appendix 1. Open cut (underground; typically used in Saskatoon), directional drilling, microtunnelling, a utility tunnel, and a utility or multipurpose bridge were assessed options. While open cut is the lowest cost option, an opportunity to also provide an active transportation crossing at a cost that is less than if these projects were pursued independently was identified. A bridge also facilitates other utilities (telephone, internet, cable, etc.) to cross the river. Adjusting the 2015 estimate into 2019 dollars, the open cut method is estimated to be \$16 million and would require at least two full construction seasons to construct.

The location for this crossing was selected due to close proximity to the Wastewater Treatment Plant and in consideration of geotechnical conditions, land ownership, and efficient connections to developable areas in the northeast.

At its Regular Business Meeting held on June 27, 2016, City Council adopted the Active Transportation Plan. The Active Transportation Plan identifies three potential active transportation river crossings; one of those being between Circle Drive North Bridge and the Chief Mistawasis Bridge near Lenore Drive.

In August 2019, the Conceptual Development Report: Active Transportation/Utility Bridge Over South Saskatchewan River was completed that further investigated a potential combined active transportation/utility bridge. The executive summary of this report is included in Appendix 2. Three styles of bridges were explored that could support the required sanitary sewer connection and provide active transportation facilities. The comparison considered capital cost, life-cycle maintenance cost, required length of construction schedule, potential for phased construction, environmental impact/regulatory approvals required, sanitary sewer pipe access, and aesthetics.

Comparing capital cost, the cable stayed and suspension bridges both were cost estimated at \$22.6 million, while the multi-girder bridge was estimated at \$27.2 million. Considering the other criteria, the suspension bridge was considered the preferred concept. Renderings of the suspension bridge option are included in Appendix 3.

The suspension bridge concept was then refined to provide more detailed drawings and a more precise cost estimate. The project estimate is \$25.1 million. The 50-year life cycle maintenance estimate is \$461,000, in present dollars.

CURRENT STATUS

All future neighbourhoods developed on the east side of the river, beginning with University Heights 3 require this new sewer crossing. Based on current rates of land sales in Aspen Ridge, concept planning is underway for University Heights 3, with the potential to construct local services in 2023. To meet development needs, design of the sanitary sewer crossing will take place in 2021 to allow construction in 2022 and 2023.

DISCUSSION/ANALYSIS

An active transportation crossing would support access from Evergreen, Aspen Ridge and future University Heights neighbourhoods to the major employment area in the north end of the city. Neither of the existing bridges to the north and south of this location provide direct connections. An active transportation bridge would provide a more direct route which is an important trip consideration for people walking and cycling. A comparison of travel modes between Funk Park in the Evergreen neighbourhood and the intersection of 56th Street and Millar Avenue in the Marquis Industrial Area is provided in Appendix 4. An active transportation bridge would also provide a connection from the current Meewasin Trail on the west side of the river to a future network on the east side. In the interim, the bridge could connect to the old Central Avenue by ramp and stairs.

IMPLICATIONS

There are varying cost implications depending on the approach which are summarized in the table below:

Crossing Method	Estimated Cost (millions)
Open cut sanitary sewer crossing	\$16.0
Active transportation (only) bridge	\$20.0
Combined sanitary sewer/active transportation bridge	\$25.1
Combined sanitary sewer/active transportation bridge (staged – building the utility bridge first and add the active transportation components at a later date)	$\$22.6 + \$5.0 = \$27.6$

A review of the above information yields the following comments:

- Building separate infrastructure would cost \$36.0 million
- The incremental cost of building separate infrastructure is:
 $\$36.0 \text{ million} - \$25.1 \text{ million} = \$10.9 \text{ million}$
- The staged approach increases the overall cost due to remobilization of construction crews and structural enhancements for the utility bridge to function without the active transportation components.
- The cost of connecting the sanitary sewer to the large interceptor pipe on the west side of the river is not included. This cost is equal among all options, and will be designed and funded separately by Land Development levies.

Other considerations include:

- A staged approach introduces risk of trespassing on a facility not safe to walk on.
- If an open cut sanitary sewer crossing is constructed, a bridge structure will not be feasible at that immediate location due to conflicts with foundations and underground sanitary sewer infrastructure.
- Planning costs to date have been shared between Transportation and Land Development. If a combined bridge is pursued, capital costs would be shared by Transportation and Land Development. Transportation currently has no funding source for the active transportation component of the project, while Land Development's portion for the utility crossing is funded by development levies.
- An open cut approach would have more of an environmental impact than the minimal in-river work of a suspension bridge.

The Triple Bottom Line (TBL) decision making tool compared the different benefits of the underground pipe and the combined-use bridge. The suspension bridge achieves greater TBL benefits than a pipe installed by open cut construction in all four areas considered.

Triple Bottom Line Comparison

Option	Environmental Health & Integrity	Social Equity & Cultural Wellbeing	Economic Prosperity & Fiscal Responsibility	Good Governance
Underground Pipe	Needs Improvement (0-20%)	No Impact	On Track (20-40%)	On Track (20-40%)
Combined Use Bridge	On Track (20-40%)	Meeting Expectations (40-60%)	Meeting Expectations (40-60%)	Meeting Expectations (40-60%)

NEXT STEPS

A prioritized list of Transportation projects identified for completion over the next ten years is being finalized. It is expected that this information will be provided to City Council in the next few months. The information will include the criteria used to prioritize the projects, project details, a timeframe for implementation, and different funding updates and scenarios. The combined utility/active transportation bridge will be included in the list of projects. If after the prioritization process the project is beyond 2022 (i.e. date of construction for the utility crossing), City Council would need to request a funding plan to fast-track this project if pursuit of the combined bridge is desired.

APPENDICES

1. Sanitary River Crossing Feasibility Study Executive Summary
2. Conceptual Development Report: Active Transportation/Utility Bridge Over South Saskatchewan River Executive Summary
3. Renderings of the Proposed Bridge
4. Comparison of Person Travel Modes

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Report Approval

Written by: Justine Marcoux, Transportation Engineer
Anna Cole, Design Engineer, Saskatoon Water

Reviewed by: Reid Corbett, Director of Saskatoon Water
Jay Magus, Director of Transportation

Approved by: Angela Gardiner, General Manager, Utilities & Environment
Department
Terry Schmidt, General Manager, Transportation & Construction
Department

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