

Southeast to West LRT – North Saskatchewan River Bridge Architectural Concept

Recommendation:

That the LRT Governance Board recommend to City Council:

That the Extradosed Bridge option, as shown in Attachments 4 and 5 of the February 5, 2013, Transportation Services report 2013TS3407, be approved as the LRT bridge type crossing over the North Saskatchewan River.

Report Summary

This report summarizes the options considered and process leading to the recommended specification for an LRT bridge crossing over the North Saskatchewan River for the Southeast LRT line.

Previous Council/Committee Action

At the January 19, 2011, City Council meeting the following motion was passed:

That the amended Southeast LRT Concept Plan for Downtown to Mill Woods, as outlined in Attachments 1 and 2 of the December 8, 2010, Transportation Department report 2010TD6407, be approved.

Report

Bridge Alignment

As part of the Southeast to West LRT project, a new LRT bridge is required across the North Saskatchewan River. The location of this new LRT bridge will be on approximately the same alignment as the existing Cloverdale Pedestrian Bridge.

A plan of the alignment, approved by City Council on January 19, 2011, as part of the Southeast LRT Concept Plan – Downtown to Mill Woods is included as Attachment 1.

Bridge Types Considered

The eight bridge types that have been considered for this crossing are:

1. Three span variable depth girder bridge.
2. Three span constant depth girder bridge.
3. Three span delta frame bridge.
4. Three span twin tower extradosed bridge.
5. Three span single tower extradosed bridge.
6. Three span tied arch bridge (three arches).
7. Three span through arch bridge (one arch).
8. Two span single tower cable stayed bridge.

Options 1, 3, 4, 6, 7 and 8 were presented to the public through a series of open houses. Option 2 was not presented due to its low aesthetic value. Option 5 was not initially presented due to its similarity with Option 4. Through a combination of public input and an initial

technical evaluation, bridge options 1, 5 and 8 were selected to proceed into the next stage of public consultation and preliminary design. Option 5 was subsequently advanced over Option 4 because it was determined that the single tower was adequate to span the river.

See Attachment 2 for the initial evaluation, along with renderings of the bridges considered.

Based upon further public consultation and a second evaluation of the short-listed bridge options, bridge Options 1 and 5 were deemed suitable structures for this location. The cable stayed bridge (Option 8) resulted in a structure that dominated over the river valley landscape and the Downtown skyline.

See Attachment 3 for the evaluation of the short-listed options.

Integrated Pedestrian Bridge

Three options for an integrated pedestrian bridge were considered:

1. On top, above the LRT.
2. Beside the LRT.
3. Under-slung, below the LRT.

To facilitate connections to the existing trail network without the need for extensive infrastructure to access the pedestrian bridge, it was determined that the new LRT bridge will have an under-slung shared use path suspended from the superstructure above. This shared use path will tie into the existing trail network at approximately the same alignment and elevation of the existing Cloverdale Pedestrian Bridge.

Bridge Style Recommendation

After consideration of constraints, cost, geotechnical and environmental factors, aesthetics and input from the public; a three span, single tower extradosed bridge (Option 5), with an under-slung pedestrian and cyclist facility, is recommended for the new LRT North Saskatchewan River crossing.

This bridge is a balance between the “signature” cable stayed bridge that would dominate the skyline and add significant cost to the project, and the “basic” three span girder bridge.

See Attachment 4 for renderings of the recommended bridge, and Attachment 5 for technical details.

Timeline and Next Steps

Timely approval of the bridge type will allow the remaining preliminary engineering to focus on the selected bridge and establish more refined budgets. Subject to funding approval for development of the project’s P3 procurement process, the following milestone activities will result in completion of specifications by early 2014.

- Edmonton Design Committee Pre-Consultation Meeting #1) – July 17, 2012
- Edmonton Design Committee (Pre-Consultation Meeting #2) – January 15, 2013
- LRT Governance Board & City Council Approval – February, 2013
- Completion of Preliminary Design – March, 2013

- Edmonton Design Committee (Pre-Consultation Meeting #3) – June 18, 2013
- Edmonton Design Committee (Final Meeting) – October 16, 2013

Policy

- Bylaw 7188 – North Saskatchewan River Valley Area Redevelopment Plan
- Transportation Master Plan

Corporate Outcomes

Citizens use public transit and active modes of transportation.

Public Consultation

- As work has progressed on the preliminary engineering, the bridge options have been presented to the public for their input along the entire length of the Southeast to West LRT corridor.
- The public is divided between the desire for a signature bridge (cable-stayed) and a more simplistic bridge (variable depth girder). The single tower extradosed bridge option strikes a balance between these two while considering cost, aesthetics and technical requirements.

Budget/Financial Implications

- The preliminary level cost estimate for the three span, extradosed bridge, is \$45 - \$65 million.
- As a cost comparison, the preliminary cost estimate of the three span variable depth box girder bridge (Option 1) is \$35 - \$50 million and the cable-stayed bridge (Option 8) is \$55 - \$80 million.
- Presently, there is no budget approval for SE to West LRT other

than the critical land purchases and preliminary engineering.

Justification of Recommendation

Approval of the recommended option allows Administration to focus on one bridge type through the balance of preliminary engineering, determine project budgets, continue to meet with the public and develop the P3 procurement documents.

Attachments

1. Approved Southeast LRT and River Bridge Alignment
2. Southeast to West LRT North Saskatchewan River Bridge – Bridge Options Report (September 19, 2012)
3. Recommendation for LRT Bridge over the North Saskatchewan River – Memo – (October 15, 2012)
4. Extradosed Bridge – Renderings
5. Extradosed Bridge - 90% Preliminary Design Drawing Package

Others Reviewing this Report

- L. Rosen, Chief Financial Officer and Treasurer