

Executive Summary

In May 2010 the City of Saskatoon commissioned Stantec Consulting Ltd. and Fast Consulting to conduct a Needs Assessment and Functional Planning Study of the Traffic Bridge. This study involved developing options for the future of the Traffic Bridge and its potential to accommodate a variety of pedestrian, cyclist, transit, vehicular and community functions. The scope of work included:

- An assessment of current traffic conditions;
- An assessment of current structural conditions;
- A review of the heritage significance;
- An analysis of future traffic conditions;
- Development of preliminary options; and,
- An analysis of the preferred options.

The project also included an extensive stakeholder consultation and public participation program, including three public open houses, to ensure that the public was given an opportunity to express their views and help guide the development of potential alternatives.

Originally built in 1907, the Traffic Bridge was Saskatoon's bridge first to carry vehicular traffic. The Traffic Bridge was designed as a 5-span Parker through truss, and came into being when residents of Village of Nutana agreed to merge with the Town of Saskatoon and the Village of Riversdale to form the City of Saskatoon. The heritage value of the Traffic Bridge resides in the following character-defining elements:

- Those elements which speak to its status as a landmark in the community, including its form and massing and its location on its original site;
- Those elements that reflect the property's engineering technology, such as being the Steel truss architecture; and
- Those elements that reflect the development of Saskatchewan's early concrete quality-control testing methods as demonstrated by the original large concrete piers and abutments.¹

1 "Statement of Heritage Significance: Traffic (Victoria or 19th Street) Bridge, Saskatoon", Ross Herrington, written for the Heritage Resources Branch, Province of Saskatchewan, March 2, 2008

An analysis of future traffic conditions on the Buckwold, Traffic and Broadway Bridges was undertaken for the 2029 planning horizon at which time Saskatoon is projected to have a population of 300,000. This analysis was undertaken to determine the traffic advantages and disadvantages of the following four generalized treatment options.

- Existing Traffic Bridge with narrow lanes;
- Two lane bridge with standard width lanes;
- Four lane bridge with standard width lanes; and
- Bridge closed to vehicular traffic.

The traffic analysis provided the following findings:

- **Existing Bridge** – traffic on the Buckwold, Traffic and Broadway Bridges will operate under acceptable conditions during the weekday morning and afternoon peak hours at the 2029 planning horizon. Some traffic movements at the intersection of Broadway Avenue/12th Street (top of the Broadway Bridge) may experience long delays and queue lengths which may result in unstable traffic flow.
- **Two Lane Bridge with Standard Width Lanes** – traffic conditions on the Buckwold, Traffic and Broadway Bridges will operate marginally better during the weekday morning and afternoon peak hours at the 2029 planning horizon.
- **Four Lane Bridge with Standard Width Lanes** – traffic conditions on the Buckwold and Broadway Bridges improve slightly under this option as traffic is attracted away from these corridors to the Traffic Bridge. Due to increased traffic the intersection of 3rd Avenue/19th Street (on the north side of the Traffic Bridge) experiences increased delays, queue lengths and will experience unstable traffic flow.
- **Traffic Bridge Closed to Vehicles** – traffic conditions at the intersection of Broadway Avenue / 12th Street experience increased delays and queue lengths with some movements operating at an unstable/low level of service. During periods when movements on other bridges are restricted for maintenance unstable traffic flow may occur.

The public participation process included three open houses and an online forum was developed to obtain effective community engagement that was inclusive to all, providing a balance of information regarding the project and effective means of capturing public sentiment.

The first open house was held on June 22, 2010. Approximately 250 to 300 people attended the open house. Approximately 125 persons attending the open house completed comment forms, with another 420 people responding to the online survey at that time. From this input it was noted that the majority of respondents would like to see the Traffic Bridge rehabilitated. In terms of how the bridge should be rehabilitated, respondents were divided between a pedestrian/cyclist bridge only or rehabilitating the existing bridge to its current usage which

includes vehicular traffic as well as pedestrian and cyclists. A small percentage of respondents would like a new bridge and very few support demolition of the existing bridge with no replacement. There was also limited support for rehabilitating the bridge for transit.

After the first open house, ten preliminary options based on the results of the traffic analysis, structural analysis, and the public consultation were developed. These options included:

1. Complete rehabilitation for vehicle, pedestrian and cyclist use;
2. Complete rehabilitation for pedestrian and cyclist use only;
3. Complete rehabilitation for pedestrian and cyclist use only, a “bridge park”;
4. Replace with a conventional structure for vehicle, pedestrian and cyclist use;
5. Replace with modern steel truss for vehicle, pedestrian and cyclist use;
6. Replace with a “modern signature bridge” for vehicle, pedestrian and cyclist use;
7. Replace with a conventional structure for pedestrian and cyclist use only;
8. Replace with a conventional structure with aesthetic features for pedestrian and cyclists only;
9. Replace with a “modern signature bridge” for pedestrian and cyclist use only; and
10. Demolish and remove with no replacement.

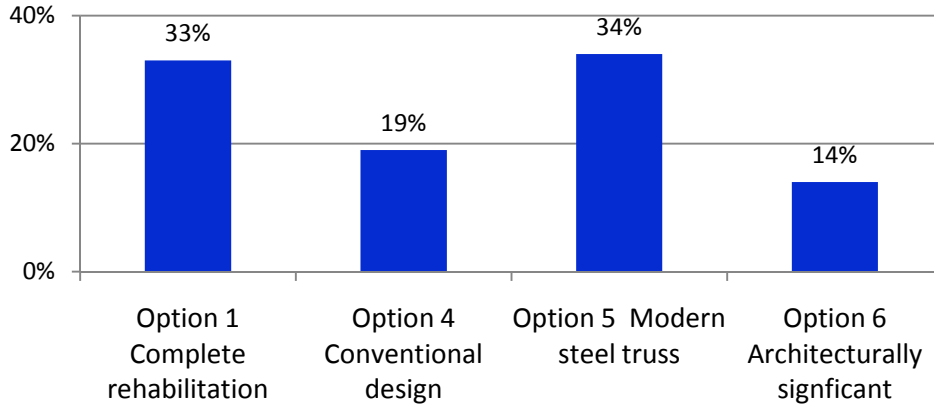
It was intended that the above options would be presented to the public at a second open house and through the online forum in September 2010.

A comprehensive structural inspection and updated load analysis of the Traffic Bridge was performed in late August 2010. The inspection revealed that the rate of corrosion that occurred since the last inspection in 2005 had been higher than anticipated. Several components of the bridge that were not identified as being in poor condition in 2005 were found to be in a very advanced state of corrosion. Due to these factors the structural integrity of the bridge became highly questionable and the decision was made to immediately close the bridge to both vehicles and pedestrians. The condition of some critical elements was so poor that there could be no certainty that the bridge would support its own weight within an acceptable margin of safety.

The unexpected closure of the Traffic Bridge on August 24th 2010, coupled with the reduction in capacity of the Buckwold Bridge due to maintenance, reinforced the significance and value of the Traffic Bridge for vehicles, pedestrians, and cyclists. As such, the above options that included pedestrian/cyclist only and complete demolition were removed from further consideration. Therefore, only above Options 1, 4, 5 and 6 were taken forward from this point.

The second public open house was held on September 15, 2010. At this open house the public was asked to provide input on the four remaining options; rehabilitation of the existing bridge, replacement with a modern steel truss bridge, replacement with a conventional bridge and replacement with a signature bridge. Comment forms were filled out by 360 of the more than 400 people who attended the open house. In addition, over 600 people responded to the survey posted on the online forum. The results of the “which is your preferred option” question are shown below:

Open House 2 – Preferred Option Responses



After the second open house, Options 1, 4, 5 and 6 were revisited and revised based on the qualitative community input received. Option 1 was carried forward to the next phase of the project. Option 4 was carried forward with the potential for enhanced aesthetics. Option 5 was carried forward with the potential of providing increased lane widths. Option 6 was dropped from further consideration. Options 1, 4 and 5 were refined to a higher level of detail to establish more accurate opinions of cost, and to refine the renderings to present a truer picture of each option. The following describes each option:

Option 1

- Complete rehabilitation for vehicle, pedestrian and cyclist use.
- Maintaining existing form and function, providing **2.9m** traffic lanes and **3.0m** pedestrian/cyclist walkways on each side.
- Where possible existing heritage aspects are preserved.
- Bridge finish will consist of a painted steel truss.
- 80 year design life
- Capital Costs = **\$24M-\$34M**
- Operating Cost = **\$150,000/year**
- Time to Construct = **24-36** months



Stantec

Error! Reference source not found.
 Error! No text of specified style in document.
 November 3, 2010

Option 4

- Replace with a modern structure for vehicle, pedestrian and cyclist use.
- Structure would provide 3.7m traffic lanes, 1.5m shoulders/cyclist lanes, and 3.0m pedestrian/cyclist walkways.
- Aesthetic details and finish depend on budget.
- 80 year design life
- Capital Costs = **\$26M - \$35M**
- Operating Cost = **\$16,000/year**
- Time to Construct = **18-24** months



Option 5

- Replace with a modern steel truss of similar form to the existing bridge for vehicle, pedestrian and cyclist use.
- The structure would consist of weathering steel.
- The bridge could be designed with wider lane widths as follows:

Option	Traffic Lane	Pedestrian/ Cyclist	Shoulder/ Cyclist	Capital Cost
5A	3.3m	3.0m	-	\$25M-\$33M
5B	3.7m	3.0m	-	\$27-\$34M
5C	3.7m	3.0m	1.5m	\$29-\$37M

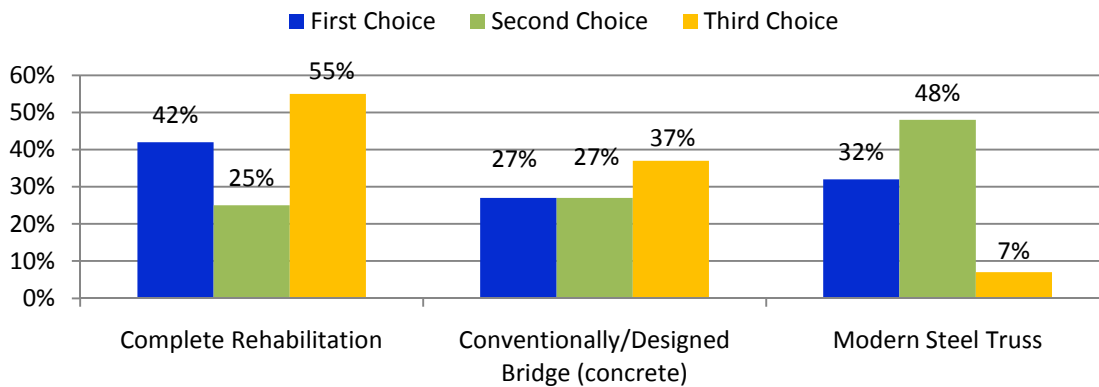
- 80 year design life
- Operating Cost = **\$15,000 - \$20,000/year**
- Time to Construct = **18-24** months



3.3m Traffic Lanes shown

The above Options were presented at a third open house held on October 20, 2010. Approximately 150 people attended the open house, of which 105 completed comment forms. Another 180 people completed the on-line survey that was available to those posting comments on the online community forum. The feedback provided in terms of preferred option is summarized below:

**Open House 3 – Preferred Option Responses
(1st, 2nd and 3rd choices)**



Based on the public consultation process, traffic analysis and structural analysis, the final three options each represent a viable solution for the future of the Traffic Bridge. As such each option maintains its own unique set of opportunities to form part of Saskatoon’s future.

Option 1 – Rehabilitate Existing Bridge

Members of the public that prefer Option 1 value the heritage and character of the existing bridge. They generally do not want to compromise these features by building a new structure. Option 1 preserves the heritage of the bridge for future generations. It maintains its existing narrow traffic lanes which also act as a traffic calming measure thus keeping traffic on this bridge and on Victoria Avenue relatively low. Of all the options presented, Option 1 includes the most risk and uncertainty in terms of construction, schedule and cost. Option 1 has the highest annual maintenance cost of all options due to the need for ongoing re-painting.

There are rational elements such as safety, convenience, linkage and tourism that people indicated are important relative to rehabilitating the existing bridge. There are also values that supporters of Option 1 have relative to the existing bridge and that run through much of the feedback from the first open house; linkage of the City’s present with its past and the pivotal role that Saskatoon’s first bridge played in amalgamating Saskatoon, Nutana and Riversdale, as well as the sense of ‘character’ that the bridge encapsulates for them from its ‘authenticity’ and ‘human scale’.

Some people comment that while rehabilitation would be their preferred option, the level of corrosion and deterioration of some parts of the bridge make them feel the existing structure is beyond saving, that they do not believe a rehabilitated bridge would last as long as a replacement bridge, or that rehabilitation has limited practicality for the next 80 years because of its narrow lanes.

Option 4 – Conventional Bridge

The key issue for open house and online participants who prefer Option 4 is function. They want a new bridge with wider lanes to handle Saskatoon's growing traffic volumes, they want it built inexpensively and quickly and they see this option as fulfilling those needs. It appears to be a common perception among the public that the conventional option will be the fastest to build. Some participants describe this choice as 'putting their emotions aside' and making what they see as the most practical choice.

The human scale that many open house participants value about the Traffic Bridge, as a result of its smaller dimensions, 'closeness to the river' and more intimate connection to the environment, would be lost with a conventional bridge according to detractors of this option. Others that are opposed to a conventional replacement bridge feel that a plain girder and deck bridge has little aesthetic value and that it would detract from the gateway to the downtown and River Landing.

Option 4 could be expanded to include the possibility of a "modern signature bridge". Option 4 in its base scenario will have relatively low maintenance costs, less risk, and a short construction period.

Option 5 – Modern Steel Truss Bridge

Supporters of Option 5 feel that it provides the best compromise between preserving the heritage feel and memory of the existing bridge, and the overall look of the riverscape. For them it offers 'the best of both worlds – the look of the original bridge with better functionality from wider lanes and longer life expectancy.' They also see this option as being more accommodating for pedestrians and cyclists as a result of wider lanes on the bridge as well as on the sidewalks.

They tend to have strong attachments to the visual profile of the bridge. Option 5 has the potential to provide a wider variety of widths. The bridge will maintain the existing profile but will differ in the type of members and finish as Option 5 consists of weathering steel which will require less maintenance costs in the future. Option 5 will have relatively less risk, and a short construction period.

People who are not supportive of the modern steel truss replacement option are concerned that it will have the same challenges with rust and maintenance as the original bridge. They are also concerned that people may not appreciate how different a modern steel truss bridge might

actually look after it is built compared to the existing structure because some of the original historical construction and design techniques would not be employed in modern truss construction.

At the end of the third round of public consultation, the results from participants that attended the open house or the online community forum and that indicated their option preference in the comment forms available at both, suggest that they are divided between preference for rehabilitating the existing bridge (42%), replacing the bridge with a conventional (concrete) design (27%) and replacement with a modern steel truss (32%). These quantified results are an aggregate summary of the opinions of the people attending the public and online forums.

Although a plurality of participants attending the open houses or visiting the online community forums value the heritage of the existing bridge and prefer rehabilitation over replacement, a significant portion of those attending prefer the replacement options for reasons they give around their perceptions related to safety and functionality.

Supporters of rehabilitating the existing bridge emphasize the importance of a safe bridge that accommodates vehicles, pedestrians and cyclists, but also one that stands as a reflection of the link to the core of Saskatoon's heritage, the downtown and River Landing. Supporters of the replacement bridge options also indicate their priorities are for a bridge that provides safe, easy access to cross the river for vehicles, pedestrians and cyclists, as well as a somewhat quicker build time and lower maintenance costs.

In summary, each of the three options has a significant contingent of community support. All three options address City Council's directive that vehicular, cycling and pedestrian traffic modes all be accommodated. The main differences between the options lie in the estimated capital and operating costs, the heritage value, and aesthetics.