CITY OF VICTORIA
Fact Sheet – Johnson Street Bridge Replacement

What is a bascule bridge?

Bascule bridges are the most common of opening bridges. Bascule is a French term for "see-saw". Bascule bridges use a counterweight which continuously balances the span or leaf throughout the entire upward swing in providing clearance for boat traffic.

Bascule bridges may be single or double-leaf. Double-leaf bridges usually have any truss structure and counterweights below the deck, while a single leaf bridge is typically a truss bridge with an elevated counterweight.

The single-leaf bascule bridge was judged to be the best system for the Johnson Street Bridge Replacement Project. The current bridge utilizes a single-leaf bascule system.

How do bascule type bridges differ?

A rolling bascule bridge does not pivot about a hinge point, but rolls back on curved tread plates attached to the girders of the main span. This design allows a greater clearance of the waterway for a given opening angle.

A reverse bascule bridge uses a counterweight that tilts forward from an upright position to raise the leaf evenly.

A cable-stayed bridge is a bridge that consists of one or more columns (normally referred to as towers or pylons), with cables supporting the bridge deck.

Who are the architects? What bridges have they designed?

All three of the concept designs come from the internationally renowned architecture firm of Wilkinson Eyre, based in the U.K. The firm has designed many international projects, including a number of bridges. They include the University of Limerick Living Bridge in Limerick, Ireland, the Nescio Bridge in Amsterdam, the Netherlands, and The Great Wharf Road Bridge in London, England. A link to Wilkinson Eyre can be found at: www.JohnsonStreetBridge.com.

What were the key findings of the condition assessment?

A comprehensive inspection of the bridge's structural, mechanical and electrical systems, conducted over the past year, found:

- Corrosion is pervasive and the paint coating has failed
- Many of the parts needed to repair the mechanical system are obsolete
- The motor brake system requires replacement
- The electrical system is obsolete and must be replaced to avoid closures

- The seismic assessment noted a 35% probability the bridge will fail due to earthquake in the next 50 years. It would likely be life threatening and irreparable. The bridge does not meet the minimum standards of the Canadian Highway Bridge Design Code.
- The "do nothing" option not acceptable. Action is required within two – three years.

The Delcan Report concluded that it would take $25 to 30 million (in 2008 dollars) to refurbish the bridge to meet seismic standards, update working equipment, and avoid further deterioration. According to the report, that work would give the current bridge about 40 years of added life.

The report also concluded that a new bridge spanning the Harbour, could be built for approximately $63 million, including new amenities such as cycling and walking paths, modern lift equipment, a new rail line, and the realignment of the road approaches.

In order to be eligible for funding from senior levels of government the bridge must be substantially completed by March 31, 2011. To meet the federal deadlines, a "design-build process" is being used, a common practice to expedite construction projects. The engineering firm of MMM Group, in partnership with Wilkinson Eyre Architects, experts in moveable bridges and design-build projects, will manage the construction project. The bridge project is expected to create 800 jobs in our community.

Who make up the Citizen Advisory Committee?

Recognizing the need for citizen involvement throughout the project, Victoria City Council established a Citizen Advisory Committee, to advise Council on the preferred functional design and aesthetic elements of the new bridge. The committee members represent various stakeholder interests in the community that share an interest in the bridge project. The advisory committee membership consists of representatives from the following areas: community, development, transportation, sustainability, urban design/architecture, and heritage.

The Citizen Advisory Committee includes:

- urban designers Sid Chow and Jim Kerr
- cycling and pedestrian consultant David Cubberly
- heritage expert Richard Linzey
- sustainability specialist Allison Ashcroft
- community representatives, Cara Segger and developer Joe Van Belleghem
- Business representative Margaret Lucas

The committee is chaired by City Manager, Gail Stephens.

What happens next?

Each of the three concepts: a single-leaf rolling bascule, a single-leaf cable stayed bascule, and a single-leaf reverse bascule, will include the elements determined to be essential in a new bridge. They include a five metre wide multi-use lane for pedestrians, bicycles and mobility devices, a railway line, three lanes of traffic, a separate on grade bike lane, and an additional bike lane and sidewalk.

All three of the design concepts presented to Victoria City Council will incorporate the elements determined to be essential in a new bridge. They include a five metre wide multi-use lane for pedestrians, bicycles and mobility devices, a railway line, three lanes of traffic, a separate on grade bike lane, and an additional bike lane and sidewalk.

Members of Victoria City Council, City staff, and the Citizen Advisory Committee, will be attending community events, holding Open Houses and appearing on the media to solicit as much public

input as possible over the next 16 days. Citizens of Victoria and regional residents will be asked which of the three styles of bridge would work best for Victoria.

Upon receiving that input, Victoria City Council will choose the preferred bridge design at a special Council meeting, on Thursday, September 24. Work will then begin on the final design process, and the requisite Request for Qualifications, and Request for Proposals for the construction of the bridge.

Further information on the Johnson Street Bridge replacement project, updates and background material can be found at: www.JohnsonStreetBridge.com.

History of the bridge:

The Johnson Street Bridge was designed under the direction of Mr. F. M. Preston, City Engineer in 1920. This is a Bascule-type bridge in which one end rises while a counter weight lowers on the opposite end. The Johnson Street Bridge has two separate Bascules, the Railway section and the Highway section.

The Strauss Bascule Company Limited, which held the patents on the design, prepared the design for the bascule spans and the operating machinery. Joseph Strauss later went on to design the Golden Gate Bridge in San Francisco. The superstructure of the bridge was fabricated in Walkerville, Ontario and contains 100 tons of steel. The City of Victoria Engineering Department built the sub-structure of the bridge. It required 10,000 cubic yards of concrete. The main opening span is 148 feet in length and when in the open position is balanced over a 45-foot fixed span. The eastern approach is spanned by a 110-foot fixed girder while the western approach has a 73-foot fixed girder.

The counter weight block on the highway span is a hollow concrete structure and contains a number of smaller concrete weights and tips the scale at over 780-tons. It balances the 350-ton opening span. The linkage is moved by two large racks which are driven by two 75 horsepower electric motors.

The Johnson Street Bridge was completed at a cost of $918,000 and opened in January of 1924. The original deck of the bridge was constructed of wood timbers. Besides being slippery in wet weather, the timber absorbed water and became heavier which affected the balance and placed excessive loads on the opening machinery. The timbers were replaced by an open steel grid decking of constant weight in 1966.

In 1979, extensive repairs were made to the superstructure, which had become severely corroded. The blue paint now on the bridge was selected because the oxides of its pigment are the same colour as the paint so that little fading of the colour occurs.

In 1995, abnormally high temperatures caused the steel decking to expand to the point the bridge would not open or close properly. This necessitated the removal of about 1-inch of the decking.