WILLIAM R. BENNETT FLOATING BRIDGE PROJECT

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Paper prepared for presentation

at the Bridges – Economic and Social Linkages Session

of the 2007 Annual Conference of the
Transportation Association of Canada
Saskatoon, Saskatchewan

Technical Paper Submission (Abstract)
Bridges – Economic and Social Linkages

"2007 Annual Conference of the Transportation Association of Canada"
Transportation – An Economic Enabler

Re: William R. Bennett Bridge Project – Kelowna, British Columbia

The project, adjacent to the City of Kelowna and crossing Okanagan Lake, is located in the Southern Interior of British Columbia. The existing 3-lane Okanagan Lake Bridge completed in 1958 is one of the few floating bridges in North America. It is currently operating well over its capacity and has become one of the most congested stretches of highway in the Interior of British Columbia. The existing bridge serves as a vital economic and social link between the City of Kelowna (pop: approx. 105,000) and the rural community of Westside (pop: approx. 40,000) and it is also a primary north-south highway corridor in the province and a integral link from the Pacific Northwest US States to British Columbia and on to Alaska.

The new, 5-lane William R. Bennett Bridge (WRBB) will replace the existing 3-lane bridge and form part of Highway #97, crossing Okanagan Lake (approx. 1 km). This new $144 million bridge is required to relieve congestion on the highway and make the route safer and more efficient for drivers. In addition, a partnership involving the Ministry of Transportation, the City of Kelowna and Westbank First Nations will facilitate upgrading the east and west approaches to the bridge to improve traffic flow, with additional lanes and intersection improvements.

The WRBB Project is a Public-Private Partnership (P3), which will be designed, built, financed and operated (DBFO) by SNC-Lavalin Inc., a leading engineering and construction company. The P3 model, benefits from private sector knowledge and expertise, resulting in lower cost to taxpayers.

Under the contract, SNC-Lavalin will:

- Design, build, finance, operate, maintain and rehabilitate the new bridge and decommission the existing bridge.
- Deliver transportation infrastructure in a timely manner.
- Deliver the bridge back to the Province at the end of the 30-year agreement in acceptable turn-over conditions.
- Assume the majority of risks for a very technically challenging piece of transportation infrastructure.

The partnership agreement with SNC-Lavalin will produce life-cycle savings of approximately $25 million to B.C. taxpayers.

- As a fixed-price contract, risk for cost overruns is held by SNC-Lavalin, rather than taxpayers.
- As a performance-based contract, incentives are in place for the contractor to meet or exceed long-term safety, reliability and capacity objectives set by the Province.

The William R. Bennett Bridge Project, currently at 40% completion in the construction phase, is planned to be open to the public in the latter part of 2008.

TAC Presentation Outline

- Introduction
- Brief History of existing bridge
- Social and Economic role of the bridge crossing
- William R Bennett Bridge project
- The P3 delivery model and it's benefits
- Future social and economic impacts
- Wrap up

Introduction

Highway #97 is the Okanagan Valley's primary north-south highway with connections to several east-west highways, including the Trans Canada Highway and Highway 3 (Crowsnest or Southern Trans Provincial Highway), 3A, 6 and 97C (Okanagan Connector). Highway #97 has been the north-south social and economic "life-line" for the movement of goods, people and resources through the Okanagan and British Columbia itself.

"The Okanagan's economic history has primarily been focused on the orchard industry dating back to the 1860's, when Father Pandosy planted the first fruit trees. It wasn't until the early 1900's, with reliable water transportation by Sternwheeler on Okanagan Lake, that the Okanagan and Kelowna itself began to change. Thousands of acres of cattle range and grain fields were shifted to irrigated orchards. In a mere decade, the Okanagan Valley turned from brown to green.

While orchards form an important part of the economic base, pioneers experimented in earnest with other crops. Perhaps the most promising of these was tobacco. At one point the Kelowna area boasted vast fields of tobacco and the industry gave birth to "Kelowna Pride" cut tobacco and cigars.

Kelowna experienced moderate growth through two World Wars, but dramatic change was on its way. The change came in the form of the Okanagan Lake floating bridge, opened by Premier W.A.C. Bennett and Princess Margaret in 1958."[1]

Farm revenues from apple and other tree fruit crops have been slowly shrinking over the last several decades, as older orchards are converted to more profitable uses such as the thriving wine industry and increasing demands for housing developments.

"There are five wine regions in BC: the Okanagan Valley, Vancouver Island, Fraser Valley, Similkameen Valley, and the Gulf Islands. British Columbia's wine industry continues to boom and the Okanagan Valley accounts for an estimated 85% of production. The dollar value of wines produced and sold in BC has increased every year since at least 1991, at an average annual compound rate of 24%. The value reached $112 million in 2005. The number of wineries of all sizes continues to expand, as do tourist visits to these wineries."[2] The number of wineries has grown dramatically over the last decade and currently there are approximately 127 wineries in the Okanagan Valley.

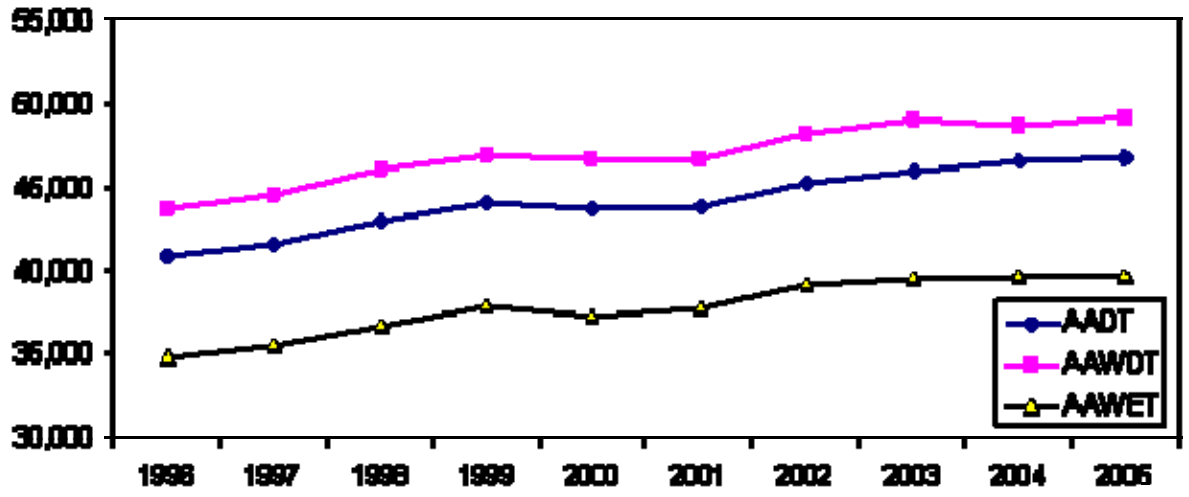
The demand for new and resale housing throughout the Okanagan Valley continues to soar as BC continues to experience robust employment growth. The Kelowna area economy is firing on all cylinders. Strong employment growth has spurred in-migration, fuelling the demand for new and resale housing. Retirees, and more recently, an influx of others seeking lifestyle oriented housing have also contributed to a sharply increased demand.

Social and Economic Role of the Bridge Crossing

"Kelowna just keeps on growing: The Interior town is the fifth-fastest growing metropolitan area in Canada."[3] "The average price for a single-family dwelling in the Kelowna area in 2006 was $465,000."[4]

Although the housing market is soaring, traffic congestion on Highway #97 across the Okanagan Lake Bridge, has created a significant impediment to housing growth and industrial development on the Westside of Okanagan Lake. The existing bridge, which has a design capacity of 37,000 Summer Average Daily Traffic (SADT), currently has 52,000 SADT volumes, with origin-destination surveys in 2003, indicating that approximately 93% of that volume being local traffic. The existing 3-lane bridge, with electrical lift-span to accommodate the passage of sail boats, creates significant traffic congestion on the highway and is known by locals and tourists alike, as a highway corridor to be avoided if at all possible.

Figure 3.9 – 1996 to 2005 - Traffic Data for: Okanagan Lake Bridge – P25-1NS-N

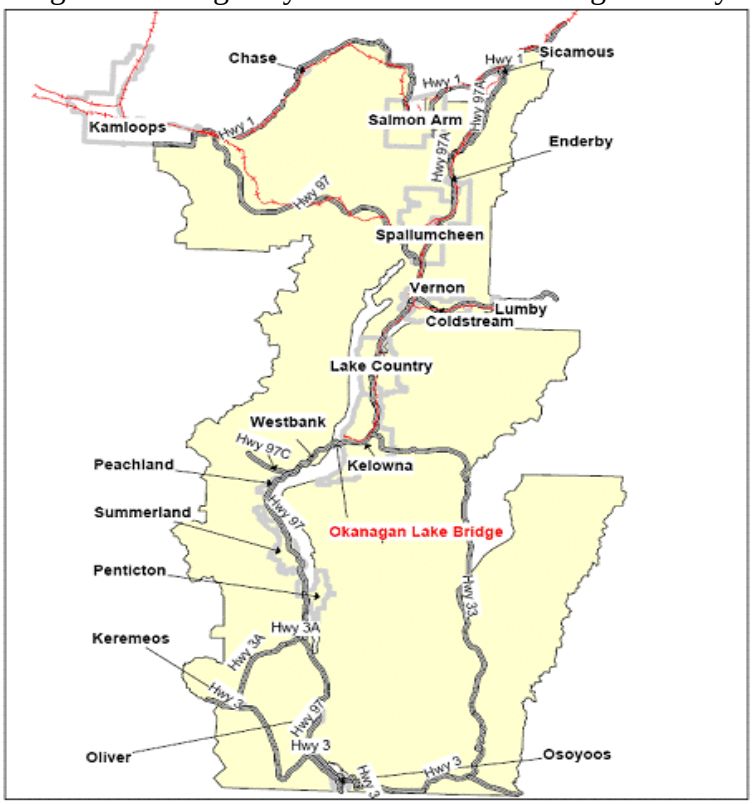


- Source: BC Ministryof Transportation website: http://www.th.gov.bc.ca/trafficData/index.asp

"There's certainly been a lot of commercial and residential development (on the Westside) meaning more jobs. So I know that it has become a more attractive option for people. And the new William R. Bennett Bridge may have a large impact on an increase in home prices, he noted." "Peachland and Westside properties currently sell very well to people from Vancouver and the Fraser Valley, said Chapman." "Kelowna and areas further along to Vernon currently sell better to buyers from Alberta. I have to think it's all because of the bridge, but I don't know that for sure. I think that when the bridge is finished, the Alberta buyer will have more interest in the Westside,"[5] he predicted.

The construction of the existing bridge in 1958 changed the complexion of development within the Okanagan Valley. "The bridge was the most pivotal piece of economic development that broadened the economic base of the Valley. What was previously an agricultural setting, gave way to more social development, with a housing boom and migration of new residents."[6]

Figure 3.7 - Highway Network in the Okanagan Valley



The History of the existing Okanagan Lake Bridge

- Historically, from 1885 to the mid-1930's, Sternwheelers such as the SS York and SS Okanagan moved goods, people and resources down and across Okanagan Lake. From the mid-30's, until the construction of the existing Okanagan Lake Bridge (1958), ferries carried vehicles across Okanagan Lake from Kelowna to Westbank. Starting in 1932, the M.V Lequime, the Lloyd Jones and the Pendozi, provided a very reliable ferry service for passengers and vehicles to cross Okanagan Lake. The alternative to crossing the 110 km long lake was a very long drive on back roads around the north end of the lake to reach a point just 2 km away. Delays for the ferry could take as much as 2 hours.

M.V. Lequime

Pendozi

- Between 1956 and 1958 construction began for a fixed link across the Okanagan Lake at Kelowna. Although the original plans were for a suspension bridge, due to very deep and compressible silts conventional bridge foundations were not practical so a floating structure was determined to be the only viable means to cross the lake.

- The Okanagan Lake Bridge was opened in July 1958. At the time it was the longest floating bridge in the world and the first large floating bridge in Canada and the Commonwealth.

- The bridge created an immediate positive impact on Kelowna and Westbank and precipitated the steady growth in population and business that has continued largely uninterrupted since.

- The bridge was constructed by Dominion Bridge and Kelowna Bridge Contracting and was made up of 12 reinforced concrete pontoons totalling 700 metres in length, 15 metres wide and 5 metres in depth, each bolted together to form a continuous rigid unit.

- The bridge pontoons are supported laterally with 12 pairs of anchors set out up to 200 metres either side of the bridge and each weighing 64 tonnes and set 8 metres into the lake bed. The anchors are adjusted to compensate for a lake level which can change from 1-2 metres throughout the year.

- An electrical lift span, 85 metres in length, with twin towers measuring 30 metres high, was constructed at the east end of the structure to facilitate the passage of marine traffic under the structure. The lift span sits upon approximately 700 piles driven into the lake bottom.

- The original bridge only carried 2 lanes of traffic, one in each direction and was later converted to three lanes with an alternating counter-flow centre lane.

- The bridge was tolled, from 1958 to 1963, to help pay for the $7.5 Million cost of the structure. (tolls were $0.10 for motorcycles, $0.50 for cars and up to $2.00 for large trucks)

The Social and Economic role of the bridge crossing

- In 1958 prior to the bridge opening, the Highway 97 traffic was predominantly local, but with a significant summer tourist component in spite of the restricted access.

- It was predicted that the first bridge would significantly impact north-south traffic movement, increasing the function of Hwy 97 in the Okanagan valley to a major inter-regional route and ultimately one of National importance. It was anticipated that the bridge would also have an impact on the growth in the Kelowna and Westbank area although it is unlikely at the time that the extent of the impact was fully appreciated.

- As anticipated, the bridge brought increased traffic from more distant origins including the USA. The growth of Kelowna began to take-off shifting steadily from a quiet lakeside town to a bustling centre that would ultimately become the most populated city and area in the interior of the Province.

- In 1983, twenty-five years after it was commissioned, the bridge had exceeded its capacity to carry traffic. The limitations were addressed through the reconfiguration of the deck to accommodate 3 lanes, introducing a centre counterflow lane that provided for 2 lane flow in the peak direction.

- In the last 24 years, traffic on the bridge has more than doubled, exceeding the average growth for the overall Okanagan corridor. This has been primarily due to the very rapid population growth on both sides of the bridge in both Kelowna and Westbank as well as the dramatic expansion of business and secondary industry in the area.

- Today Kelowna has the most rapid growth in population of any major centre in British Columbia. The new 5 lane bridge is coming just in time!

- The new bridge will have 5 lanes – three dedicated westbound lanes and two dedicated eastbound lanes as well as a 3 metre wide sidewalk on the south side to accommodate pedestrians and cyclists.

- The bridge will consist of a 277 metre long fixed, elevated structure at the west end of the bridge extending more than 20 metres above the water. The elevated section will provide a 44 metre wide by 18 metre high opening to

provide passage for vessels while maintaining uninterrupted vehicle traffic flow.

- To the east of the elevated structure will be a 700 metre long floating section, similar to that of the existing bridge…only bigger! The floating section will be constructed of 9 pontoons varying from 30 to 90 metres long by 25 metres wide, post-tensioned together to form one continuous pontoon "string".

- The pontoons will be constructed of concrete and designed to be completely water-tight to ensure that the bridge will remain in-service for its 75 year life expectancy. Ensuring water-tightness requires particular attention to details for placing concrete, preparation of joints and concrete strength. In addition to water-tight walls, each pontoon is made up of a series of water-tight compartments to ensure that should one cell fill with water, adjacent cells will remain dry.

- The pontoons, which weigh up to 6000 tonnes each, are being constructed at a graving dock site approximately 8 kilometres north of the bridge site. Once completed, each pontoon is floated into the lake and towed to the bridge site where they are carefully positioned alongside the existing bridge and connected together.

- To the east of the existing bridge project the City of Kelowna is performing approximately $24 million dollars of upgrades to the six intersections immediately east of the tie-in to the bridge. These upgrades will improve traffic flow through the City of Kelowna, relieving some of the congestion that is typical at the entrance to the City.

- To the west of the bridge project, the Province of BC in conjunction with Westbank First Nation, is delivering upgrades to the Campbell Road Interchange, replacing the existing at-grade intersection with a grade-separated overpass and roundabouts.

- Future work on the west side of the bridge along Highway #97, includes replacing the existing at-grade intersections at Westside Road and Boucherie Road with grade-separated interchanges to improve traffic flow out of the City and into Westbank.

The P3 Model and its benefits

- WRBB is one of the first major transportation projects in BC to be implemented as a Public-Private Partnership (P3).

- The Okanagan Lake Concession Ltd Partnership headed up by SNC Lavalin has a 30 year concession agreement to design-build-finance-operate (DBFO) the new bridge, including the decommissioning and disposal of the existing floating bridge.

- MOT assessed the delivery of the new bridge using both a public private partnership and a conventional model (as required by BC's Capital Management Framework). The DBFO model was ultimately selected as it offered greater value for the money. Some of the key reasons for this were:

    1. A fixed price contract was established during a period of substantial escalation in the construction industry.

    2. Design and construction was integrated with operations, maintenance and rehabilitation to facilitate optimization of lifecycle costs.

    3. Design and construction risk was transferred from the Province to the Concessionaire for this complex and sensitive structure.

    4. A performance based payment mechanism has been established which provides incentives for the Concessionaire to meet or exceed expectations for such tangible measures as safety, traffic flow, lane availability and user satisfaction. No payments will be made until the bridge is completed and open to traffic.

- The value for money assessment of the project options pegged the traditional public sector delivery model at $195 Million over 30 years on a net present value (NPV) basis. The DBFO delivery model offered a benefit over the traditional model of $25 million (NPV) over 30 years representing a 15% saving.

- The selected delivery model achieved a balance of risk assignment between the public and private sectors allowing each to assume the risk

they are best able to handle. For example, the Province assumed the policy, standards, pre-existing environmental and archaeological and some geotechnical risk. The Concessionaire took on the design, construction, traffic and operational risk in delivering and maintaining the infrastructure.

- Some of the key Public benefits of the project include:

    1. No tolls

    2. 24hr / 7 day use of bridge (as boats will pass under high level span in new navigation channel without closures.)

    3. Larger vessels and all sailboats will also have unrestricted 24/7 access under the new bridge. Existing bridge only opens 3-5 times in 24 hrs for these vessels.

    4. The new 5 lane structure will largely eliminate congestion related to capacity on the existing bridge.

    5. Pedestrians and cyclists will have a dedicated 3 metre wide laneway separated from vehicle traffic.

    6. Overhead signage and lighting, improved sight-lines and median barrier will improve safety on the new bridge.

    7. The Concessionaire is incentivized through performance payments to provide excellent user satisfaction and minimize lane closures.

    8. Improved access to the bridge is being achieved through adjoining intersection and interchange construction on both the east and west bridge approaches.

Future Social and Economic Impacts of the Bridge

- Over the last 10 years, the central Okanagan area population has been growing by an average of 2% annually.

- Okanagan Westside which includes Westbank and the area directly serviced by the William R. Bennett Bridge has been growing by an average of just under 3% annually.

- The majority of the growth has been a net increase in migration from other parts of Canada and the world.

- The Westside area has been identified as the prime commercial development location for the central Okanagan.

- Although population and business growth has been steady and robust, the transportation has been recognized as a limiting factor. The bridge in particular has become a choke-point to continued growth.

- With the construction of the William R. Bennett Bridge becoming a reality, a number of commercial development proposals totaling about 400,000 M2 are now ready to launch.

- The Westside area, with 40,000 residents, is the most populated unincorporated community in the Province. A Referendum is currently scheduled for June 16, 2007, which would potentially see the Westside incorporate as its own municipality or amalgamate to the City of Kelowna.

- Anecdotal evidence shows that both personal and business mobility has been inhibited by the congestion in the vicinity of the bridge and its approaches. Trip decisions are often limited to time of day or deferred entirely.

- It is clear that the new bridge, while not directly triggering the accelerated growth of the central Okanagan economy, it will release a pent up demand that has been built up over the last 10 years due to the construction of the new bridge.

Conclusion

"For years, only one major highway passed through the city of Kelowna: Highway 97. The road itself is good, but its connections to all points east and west in the province were only managed by using the slow, curving Trans Canada Highway and the Crowsnest Highway. As the Okanagan Valley is a popular getaway for residents in Vancouver, a new freeway was built into the BC interior in 1986, eliminates over two hours of travel time between the two major destinations.

Kelowna is connected to Westbank by the three-lane Okanagan Lake Bridge which links Highway 97 south. The floating bridge is currently being replaced as it has outlived its usefulness and is incapable of supporting the current traffic levels. The construction of a new bridge -- William R. Bennett Bridge -- has begun, although there has been a lot of controversy surrounding the project. Delays and connectivity are some of the major issues, since the highway leading up to the bridge is only three-laned and is not a freeway. This will be rectified with opening of the new 5 lane William R. Bennett Bridge in 2008, which will include 2 interchanges on the west side approaches.

In mid-2001, 18.4% of the resident population in Kelowna were of retirement age (65 and over for males and females) compared with 13.2% in Canada, therefore, the average age is 41.1 years of age comparing to 37.6 years of age for all of Canada"[7].

In the five years between 1996 and 2001, the population of Kelowna grew by 8.2%, compared with an increase of 4.9% for British Columbia as a whole. Population density of Kelowna averaged 50.9 people per square kilometre, compared with an average of 4.2, for British Columbia altogether.

As is noted above, Kelowna and the Okanagan Valley has gone through significant social and economic growth over the last 100 years. Okanagan Lake, Highway #97 and the connectivity of the two has, and continues to be integral to the growth and development of the Valley and prosperity of British Columbia. The ability to cross Okanagan Lake by Ferry in the 1930's was a major first step; with the construction of the existing bridge in 1958 the mobility of goods, people and services increased exponentially.

With the impending completion of the new 5-lane William R. Bennett Floating Bridge, the predictions are already in – extensive growth in commercial and residential development on BOTH sides of the bridge…and with that, more jobs as well.

It has been said, that when the existing bridge was built 50 years ago that, "The bridge was the most pivotal piece of economic development that broadened the economic base of the Valley"[8]

I firmly believe that with the completion of the new William R. Bennett Bridge…we will see history repeat itself.

Grant A. Lachmuth, AScT
Ministry of Transportation Representative
William R. Bennett Floating Bridge Project

[1] http://www.okmapguides.com/okanaganhistory.htm
[2] BC Credit Union: Economic Analysis of British Columbia, August 2005.
[3] The Vancouver Sun, Wednesday, March 14, 2007.
[4] Housing Market Outlook, Canada Mortgage and Housing Corporation, 2006.
[5] Bert Chapman, Pres., Okanagan Mainline Real Estate Board, Capital News (C3), Sunday, March 11, 2007.
[6] Pioneers & Places Video, Wayne Wilson, Director, Kelowna Museum, 2005.
[7] Via 97 Website www.nric.com
[8] Pioneers & Places Video, Wayne Wilson, Director, Kelowna Museum, 2005.