



May 30, 2008

Mr. Andrew J. Niemiec  
 Executive Director  
 Knik Arm Bridge and Toll Authority  
 550 West 7<sup>th</sup> Avenue, Suite 1850  
 Anchorage, Alaska 99501

**Re: Knik Arm Bridge Project Travel Savings to the Bridge Patrons  
 in the First Year of Operations**

Dear Mr. Niemiec:

In November 2007, Wilbur Smith Associates (WSA) was requested by the Authority to quantify the monetary aspects of a hypothetical delay in an opening of the proposed Knik Arm Bridge to traffic on January 1, 2012. WSA's letter report of November 16, 2007 documents the quantification of the delay costs on an average daily basis. In this current report WSA has estimated travel savings of the Bridge opening using the same method and same data set as the delay cost estimation. WSA has also updated those data sets to reflect more recent fuel prices and at assumed increments of \$1.00 per gallon of regular grade gasoline over a range from \$4.00 to \$6.00 per gallon to provide indicia of potential travel savings at those levels of fuel cost. Table 1 summarizes the estimated travel savings expected to be enjoyed by patrons of the Bridge net of tolls paid for its use.

<u>Gasoline Price</u>	<u>Daily Travel Savings</u>	<u>Annual Travel Savings</u>
\$ 2.55 (1)	\$224,600	\$ 81,979,000
3.53 (2)	\$247,600	90,374,000
4.00 (3)	\$259,800	94,827,000
5.00 (3)	\$285,400	104,171,000
6.00 (3)	\$311,000	113,515,000

(1) Average Gasoline Prices per Gallon for Year 2006-2007  
 (2) Average Gasoline Prices per Gallon for April 2008  
 (3) Potential Future Gasoline Prices per Gallon

The quantified travel savings associated with the opening of the Knik Arm Bridge to traffic shown in Table 1 are comprised of the following cost savings:

- Travel time savings to patrons of the Bridge resulting from decreased travel time; and
- Travel cost savings to patrons of the Bridge resulting from decreased travel distance.

These monetary benefits are offset by tolls paid by patrons for the use of the Bridge, which have been subtracted to produce the net results reflected in Table 1.

There are other social benefits derived from the bridge project which provides additional network capacity in the transportation system. These benefits will be an increase in mobility, a decrease in travel time from less congestion and less delay enjoyed by the non-bridge motorists within the region, and decreased pollutants to the environment resulting from less congestion and reduced miles traveled. These social benefits are not reflected in our quantified travel savings estimate. The travel savings estimate is specific to the Bridge patrons represented by the projected 8,400 daily trips in 2012.

The estimate is based on an average day within the 2012 annual traffic projection reflecting ramp-up. Variation in seasonality has not been reflected. The estimate is based on Annual Average Daily Traffic (AADT) from the forecast model used to calculate the gross toll revenues. A seasonal factor adjustment would result in increased daily travel savings in the summer months and reduced daily travel savings in the winter months, but would not impact the average of the annual result. WSA has elected not to reflect the seasonal difference between the months of the year. Finally, this analysis is predicated on the base projection assuming a \$5.00 passenger car toll rate and proportionately higher rates for commercial vehicles for the assumed first full year of operations (2012). Additional assumptions are provided under the Methodology discussion.

## METHODOLOGY

An analysis of a select link assignment utilizing the traffic forecast model was completed for the assumed opening year 2012 to determine the origin and destination pairs (traffic-analysis-zone to traffic-analysis-zone movements) under a “build” scenario for the 8,400 average trips per day forecasted for that year. This select link assignment identified the entire set of zone pairs specific to bridge travel. These identified zone pairs were then used to isolate, within the congested time and distance traveled, matrices specific to time and distance values needed for the cost estimate.

A similar collection process utilizing the same zone pairs was done under a “no build” scenario. The difference between the travel congested times (vehicle hours traveled – VHT) under the “build” and “no build” scenarios quantifies the time savings afforded patrons by using the Bridge. This time savings is specific to each zone pair but can be characterized as a range between 30 minutes and one hour and 36 minutes.

Similarly the difference between the trip distance (Vehicle Miles Traveled – VMT) under the “build” and “no build” scenarios quantifies the travel distance savings afforded to motorists using the Bridge. This distance savings is again specific to each zone pair but can be characterized as a range between 17 and 70 miles.

This analysis assumes an average Value of Time (VOT) of \$0.2894 per minute, which is the weighted average of \$0.273 for passenger cars and \$0.410 for commercial vehicles. These VOT figures were derived from the *Knik Arm Stated Preference Survey Report* dated June 2007. WSA also assumed a Vehicle Operating Cost (VOC) of \$0.2206 per mile which is the weighted average of \$0.197 for passenger cars and \$0.394 for commercial vehicles.

A calculated daily time savings of 10,433 hours at \$0.2894 per minute and a distance savings of 446,024 miles at \$0.2206 per mile produce an estimated cost savings, net of tolls paid, of \$224,600 per day as a result of the Bridge opening.

The above estimate used an average passenger vehicle operating cost that incorporates an average cost of regular grade gasoline of \$2.55 per gallon. With increased fuel costs in the past year and the likelihood of further increases in gasoline prices, WSA has estimated the travel savings using current prices. With a \$3.53 per gallon cost of gasoline for the month of April 2008, the above travel savings increases to \$247,600 per day. WSA also estimated the travel savings that would occur at \$4.00, \$5.00 and \$6.00 per gallon of gasoline. The anticipated travel savings are \$259,800, \$285,400 and \$311,000 per day, respectively. Table 1 above summarizes estimated annual travel savings resulting from the Bridge construction assuming an opening day of January 1, 2012. Table 2 below summarizes the components of those daily travel savings at various fuel cost assumptions.

**Table 2**  
**Components of Knik Arm Bridge Estimated Daily Travel Savings**  
**Opening Date of January 1, 2012**

<b>Gasoline Price</b>	<b>Vehicle Operating Cost Saved</b>	<b>Value of Time Saved</b>	<b>Less Tolls Paid</b>	<b>Net Daily Travel Savings</b>
\$ 2.55 (1)	\$ 98,400	\$ 181,200	\$ 55,000	\$ 224,600
3.53 (2)	121,400	181,200	55,000	\$ 247,600
4.00 (3)	133,600	181,200	55,000	\$ 259,800
5.00 (3)	159,200	181,200	55,000	\$ 285,400
6.00 (3)	184,800	181,200	55,000	\$ 311,000

(1) Average Gasoline Prices per Gallon for Year 2006-2007  
 (2) Average Gasoline Prices per Gallon for April 2008  
 (3) Potential Future Gasoline Prices per Gallon



In the above estimation of travel savings WSA used the following assumptions:

- VOT was kept constant regardless of gasoline prices;
- Vehicle Insurance was not included in VOC;
- Vehicle depreciation was not included in VOC;
- 2.65 percent inflation rate was used to estimate travel savings per day from base year 2008 to year 2012;
- Inflation effects on the above gasoline prices were not considered to estimate year 2012 travel savings;
- Possible changes in behavior of driving less by combining trips, eliminating discretionary trips or possible mode switch from car to transit were not considered in the above estimates; and
- Possible long-term affects of concentration of home-work activities as the result of higher cost of driving were not included in the above estimation.

The projected travel savings afforded patrons of the Bridge are substantial, and will increase as motor fuel prices increase. The travel savings quantified in this letter report do not include other social benefits derived from the additional network capacity, resulting in increased mobility, decreased travel time, less congestion and delay, and less pollutants discharged into the environment that will be enjoyed by other non-bridge motorists within the region because of the Bridge.

Current accepted professional practices and procedures were used in the development of these delay cost estimates. However, as with any forecast of the future, it should be understood that there will be differences between forecasted and actual results. These difference could be material. There is always uncertainty regarding the specific nature and timing of future development.

Sincerely,

WILBUR SMITH ASSOCIATES

Raymond P. Richard  
Vice President

cc: Kevin P. Hemenway, Chief Financial Officer  
Verne A. Geidl, Chief Engineer