



Review of Draft DEIS Cost Estimate and Reconciliation with PBS&J Cost Estimate Review Study (dated June 2006)

Prepared by



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Background

In December 2005 RISE Alaska in association with HDR provided a cost estimate for constructing the Knik Arm Crossing Project entitled “Preliminary Quantities and Cost Estimate Technical Memorandum – Initial Build-Out Volume I (EIS Estimate).

In June 2006 the FHWA Major Projects Unit assembled a project review team to verify the accuracy and reasonableness of the earlier estimate. PBS&J was the consulting firm hired by FHWA to lead the cost review team.

On June 12, 2007 HDR requested RISE to review the EIS Estimate in preparation for the release of the final EIS. The review would first identify and explain any differences between the EIS Estimate and the PBS&J review. A second task is to evaluate escalation assumptions made in the original study against actual increases in costs experienced from December 2005 to December 2006. For consistency the project scope and time-line was unchanged from the December 2005 estimate and is based on a preliminary 30% design of one representative alignment and structure type.

EIS Estimate versus the PBS&J estimate review.

The objective of the PBS&J review was to “verify the accuracy and reasonableness of the current total cost estimate to complete each project and to develop a probability range for the cost estimate that represents the project’s stage of design”. The PBS&J review focused on one route. The route evaluated included the northern access option on the west-side, the 8180 foot crossing option, and the Erickson variant on the east-side. The EIS Estimate for this route was \$599.4 million. The PBS&J review estimate “most likely” cost for this route was \$639.4 million, a \$40 million difference. In addition to the most likely estimate, PBS&J also ran a Monte Carlo simulation which resulted in a project cost range of \$618.0 million to \$650.1 million with a 60% confidence level. The PBS&J review used assumptions and methods which varied from the EIS Estimate. Even with these variations the \$40 million difference can be explained by two major increases in the project scope and a significant changed assumption. The primary scope increase was to include a larger cut and cover tunnel in the Erickson variant. This one change accounted for \$20 million; ½ of the cost difference. Although this project scope change has been discussed internally, it was not in the Phase 1 scope when the DEIS Estimate was prepared and it is not in the Phase 1 scope today. The second scope change was additional right of away acquisition costs of \$6 million. This additional right of way acquisition is not needed for Phase 1. The final major change was to increase environmental/mitigation costs by approximately \$6.3 million.

Page 4 of the PBS&J report clearly lists these changes as the primary difference between the two estimates: “This cost increase was mostly the result of adding to the scope of the cut and cover tunnel at Government Hill (~\$20.0 million), right-of-way cost increases

(~\$6.0 million) and Environmental/Mitigation cost increases (\$6.3 million)." Without these changes in scope the estimates would have differed by an insignificant 1%. The scope increases that caused the PBS&J estimate to be higher than the DEIS Estimate are not included, nor have they ever been officially included in the EIS project scope.

DEIS Estimate escalation assumptions versus actual cost increases between December 2005 to December 2006.

The DEIS Estimate assumes an escalation rate of 4% per year. This assumed rate is higher than the historical average increases in construction costs of 3.0% to 3.5% per year. This aggressive assumption was used to recognize the abnormally high, commodity price driven, construction cost escalation that had occurred since 2004.

The model escalation assumption was evaluated against actual increases in construction cost as measured by the Bureau of Labor Statistics (BLS), Producer Price Index (PPI) for Highway and Street Construction (Series ID: PCUBHWY __BHWY). The time period compared was between December 2005, when the DEIS Estimate was published, and December 2006, the most current PPI data that is not "preliminary" and subject to future revision. This index information is included as attachment 1.

Between December 2005 and December 2006 this index increased 6.2%, 2.2% more than the 4% escalation assumed in the DEIS Estimate. Although the 2005 -2006 price increase is more than the DEIS Estimate escalation assumption and above the historical norms of 3.0 to 3.5%; it is reasonable to assume that over the three year period, between the date of the DEIS Estimate and the midpoint of construction, escalation may average 4% as assumed. Abnormally high or low changes tend to adjust back toward the norm. We continue to have confidence in the 4% per year escalation assumption.

Adding confidence in our escalation assumption, a major earth moving project in the same vicinity of the Knik Arm Crossing project and using material from the adjacent Elmendorf AFB anticipates the average cost of gravel fill to be under \$10 per cubic yard. This information supports earthwork unit pricing used in DEIS Estimate which were based on large quantities and short haul distances. It follows that if the earthwork unit pricing used in the DEIS Estimate remain valid today (zero escalation from December 2005) and we adjust the 6.2% PPI proportionate to the earth work portion of the project, the December 2005 – December 2006 increase adjusts to 5% (earthwork represents about 20% of total project cost).

Findings and Conclusion.

The cost differences between the DEIS Estimate and the PBS&J review are primarily explained by additional project scope in the PBS&J estimate. The scope increases that caused the PBS&J estimate to be higher than the DEIS Estimate are not included in Phase I of the project.

A review of escalation assumptions in light of actual BLS PPI data between December 2005 and December 2006 and new information on earth work unit pricing supports an escalation assumption of 4% per year reasonable.

Based on these findings, we conclude that the DEIS Estimate remains a valid estimate of the project.

Attachment 1



**U.S. Department of Labor
Bureau of Labor Statistics
Producer Price Index Industry Data**

Source: <http://data.bls.gov/cgi-bin/dsrv>

Series Catalog:

Series ID : PCUBHWY--BHWY--
Not Seasonally Adjusted

Industry : Highway and street construction
Product : Highway and street construction
Base Date : 8606

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann	Dec to Dec Change
1986						100.0	98.0	97.6	98.3	97.7	97.6	97.6		
1987	98.5	99.2	99.4	100.0	100.1	100.7	101.2	101.8	101.6	101.9	102.6	102.4	100.8	4.9%
1988	102.2	102.4	102.5	103.3	103.8	103.8	103.8	103.9	103.6	103.4	104.0	104.3	103.4	1.9%
1989	105.0	105.4	105.9	107.4	108.1	107.8	107.4	106.7	107.2	107.6	107.5	107.4	107.0	3.0%
1990	109.4	108.4	108.2	108.4	108.6	108.4	108.3	110.4	113.1	115.4	115.9	114.2	110.7	6.3%
1991	113.3	112.0	110.3	110.1	110.5	110.4	109.9	110.3	110.4	110.1	110.2	109.3	110.6	-4.3%
1992	108.8	109.1	109.3	109.4	109.9	110.5	110.4	110.4	110.6	110.5	110.6	110.1	110.0	0.7%
1993	110.4	110.7	111.2	111.7	112.0	112.1	111.8	111.7	112.1	112.6	112.5	111.7	111.7	1.5%
1994	112.1	112.7	112.8	113.2	113.5	114.1	114.8	115.7	115.5	115.3	115.9	115.6	114.3	3.5%
1995	116.5	116.8	117.1	118.5	119.0	119.3	118.9	119.0	119.2	118.7	118.7	119.1	118.4	3.0%
1996	119.9	119.8	120.6	122.0	122.6	122.0	122.0	122.3	123.0	123.5	123.8	124.0	122.1	4.1%
1997	124.6	124.7	124.2	124.3	124.5	124.4	124.2	124.9	125.0	124.9	124.9	124.3	124.6	0.2%
1998	123.8	123.4	123.0	123.6	124.0	123.9	124.0	123.4	123.6	123.6	123.3	122.3	123.5	-1.6%
1999	122.8	122.6	123.3	125.4	125.9	126.0	126.9	128.1	129.0	128.8	129.6	130.7	126.6	6.9%
2000	132.0	134.0	136.0	135.6	135.8	137.6	137.1	136.6	138.9	138.5	138.4	137.3	136.5	5.0%
2001	137.8	138.2	137.4	138.5	139.9	138.8	136.6	137.0	138.4	135.4	134.1	132.4	137.0	-3.6%
2002	132.9	132.4	132.7	133.3	133.8	133.9	134.1	134.2	134.4	134.4	133.9	133.7	133.7	1.0%
2003	134.7	135.7	136.8	137.1	137.0	136.9	136.7	136.9	136.8	136.7	137.1	137.2	136.6	2.6%
2004	140.5	141.2	142.5	145.2	147.9	147.0	149.2	150.5	151.8	155.5	155.4	152.0	148.2	10.8%
2005	154.3	156.5	160.4	162.9	162.4	163.7	167.6	170.0	176.1	180.8	173.1	173.4	166.8	14.1%
2006	177.5	175.9	179.4	185.4	187.9	190.4	191.8	192.9	185.9	183.2	182.9	184.1	184.8	6.2%
2007	183.1	184.9(P)	190.2(P)	194.6(P)	198.3(P)									

P : Preliminary. All indexes are subject to revision four months after original publication.