

The Real Cost of the Knik Arm Bridge

\$2.6 Billion PLUS \$X

January 28, 2013, by Jamie Kenworthy and Bob French, (Revised 2-8-13 to add boxed highlights and on 2-18-13 to fix slight errors in p. 4 population box and footnotes 16 and 23.)

This 2013 update estimate of the cost to the state of the project is \$2.6 billion plus a new \$X factor.

The following recent developments **add** to the state's cost:

- In September 2012, the Knik Arm Bridge and Toll Authority (KABATA) was turned down for a \$500 million low cost federal loan, leaving a \$500 million hole in KABATA's latest August 2012 Financial Plan.¹
- \$35 Million higher Bridge and approach costs. The original bridge design was for an 8200' span. In November 2011, KABATA agreed to a 9200' span,² slightly longer than San Francisco's Golden Gate Bridge, which would add at least \$15 million³ to the cost. A Settlement with the Municipality of Anchorage for the east approach road to take less Port of Anchorage land will require a longer and larger retaining wall against the bluff, which would add roughly \$20 million.
- KABATA's current proposal includes an initial 6 lane "cut and cover" tunnel under Government Hill. KABATA's 2007 itemized cost estimate was for an initial 2 lane tunnel.
- In 2007, KABATA contracted with the Geotechnical firm Shannon and Wilson to do soil borings every 500 feet in Knik Arm and along approach roads. The first page of the 323 page document from Shannon and Wilson's 2007 Geotech Memorandum recommended that additional soil borings be done on the east side of Knik Arm to better determine the extent of the inconsistent sub-soils and to determine the depth of the unstable Bootlegger Cove Formation Clay (Bootlegger Clay) deposits once the exact route of the Bridge was known.⁴ That additional geotechnical work was not done and in December 2012, KABATA stated that this geotechnical risk will *now be borne by the project developer*.⁵ Presumably this would result in higher cost bids.
- Based on the Shannon and Wilson geotech work, the firm of PND in 2007 did a 35% design cost estimate that, inflation corrected to 2012, is now \$710 million. With financing costs included, Phase I of the project now totals \$1 billion. PND also did the design and cost estimate for the Port of Anchorage project. As detailed in the recent CH2MHill review of the Port project, the instability of Bootlegger Clay and presence of "boulders" are factors in the failure of the Port's sheet piles, which led to huge and ongoing cost overruns.⁶ In regards to the Knik

TIFIA loan turn-down for 5th time, leaves KABATA with a **\$500 million dollar hole** in their finance plan. **Half** of their estimate! They will need to turn to Legislature in 2014 to fill that hole

KABATA has not provided an itemized, complete cost estimate **since 2007!** They need to provide one in the same format, so changes are clear

Arm Crossing, until the depth and the consistency of the deposit of Bootlegger Clay in Knik Arm is firmly understood, engineers cannot estimate how deep and difficult it will be to drill the pilings to engineer against clay liquefaction in a seismic event. So, added to this \$2.6 Billion cost estimate is + \$X to represent additional costs for changes in design, this incomplete investigation, and the resultant uncertainties of project costs.

- Those additional costs have not been detailed in an itemized form since 2007. KABATA needs to provide a revised cost estimate to itemize these additional costs, as well as materials and labor costs that have changed since 2007.

A third party review by CH2MHill has sharply critiqued the reliability of PND's design and cost estimate on the Port of Anchorage project and the engineering and installation failures of PND's design. The installation failures of the sheet piles in Bootlegger Clay in Knik Arm at the Port mean that 2 years work will need to be completely removed and the costs to fix this massive failure is still unknown.

PND designed the Port of Anchorage Expansion. Should we trust their bridge design?

Should the legislature rely on a Bridge Design and Cost Estimate from PND on another public project where they also failed to complete recommended Knik Arm geotech work?

Still waiting on the Legislative Budget & Audit Report

On January 16, 2012, Representative Mike Hawker requested an audit⁷ of KABATA's finances and its toll revenue analyses "for reasonableness." HB 23 / SB 13 should not even be considered until the results of that audit are in, and the full range of possible costs to the state are known.

Determining the Real Cost of the Knik Arm Bridge

Both KABATA's estimate of project cost and this realistic estimate share the following common elements:

- Passage of HB 23 and SB 13 to create an unlimited reserve fund to make up the toll shortfall and provide 36 years of guaranteed "availability payments" to a private investor that KABATA estimates will total \$2.3 Billion
- Same deal structure with \$607 million for Operations & Maintenance, Tolling Operations, capital expenditures and KABATA administrative costs until bonds and contractor obligations are retired in 2051.⁸
- One way tolls of \$5 for cars/pickups and ~\$18 for commercial vehicles (varying depending on the number of axles) in Year 1 with tolls rising 2.5% per year to one way tolls of \$12.16 and a \$43.79, respectively, in Year 36. So a commuter driving a car 200 days a year between Anchorage and Mat Su would pay \$2000 in Year 1 and \$4832 in Year 36.

For comparison's sake, most base assumptions between this "Real Cost" Paper and KABATA's financial plan are the same.

Four Different Assumptions between KABATA’s Cost Estimate and this Realistic estimate

KABATA’s financial plan projects that a \$150 million reserve fund would be repaid and the project will pay for itself. This *Realistic* estimate details how the unlimited state guarantee in HB 23/SB 13 will end up costing the state \$2.6 Billion + \$X because of the *four following changes from KABATA’s assumptions:*

1. Loss of Federal TIFIA \$500 Million Loans and Grants, Add \$500 Million to State Cost

On September 25, 2012 KABATA was rejected for a \$500 million federal TIFIA loan.⁹ Since 2007 KABATA has been turned down *five times* for low cost federal TIFIA loans of \$300-500 million. TIFIA loans are low cost because they are below market interest rates and require no payments until the fifth year after a project opens.

With our national infrastructure crumbling, do you think the Feds will give **HALF** of the available \$1 Billion in TIFIA loans to the “Bridge to Nowhere”?

In competing for low cost TIFIA loans where requests average ten times the available TIFIA funds, the Bridge will continue to be uncompetitive against other projects that can promise to relieve existing congestion, show real private sector risk sharing, leverage more public dollars, and/or serve far larger numbers of vehicles or mass transit users. With bridges on lower 48 interstates needing immediate repairs, it’s unrealistic to assume that any administration will commit half the annual TIFIA budget to the infamous “Bridge to Nowhere.”¹⁰

The state now has a choice of replacing the \$500 million Federal TIFIA loan with a state appropriation, or somehow financing that amount, which would result in far more than \$500 million in additional interest costs.

In either case, the project lacks a current project budget showing realistic financial feasibility.

2. Realistic Toll Forecast, Add \$2.116 Billion to State Cost

KABATA’s toll and revenue consultant CDM Smith this year lowered its cumulative revenue forecasts from \$4.8 billion over 36 years to \$4.23 billion over 37 years.¹¹ The following evidence suggests that this revenue estimate *is still approximately 50% too high.*

- The track record of KABATA consultant CDM Smith (formerly Wilbur Smith) is to *overestimate toll revenue by an average of 118 % for the first five years all US projects were open.* This data was provided by the Transportation Research Board of the National Academy of Sciences and analyzed by a former CIA economist in 2012.¹² Already two CDM Smith projects in California and South Carolina have gone *bankrupt* when the CDM Smith toll forecast proved woefully short.¹³

2 projects went bankrupt by relying on CDM Smith’s projections. Should Alaska rely on them?

- Revenue forecasts are based on population and employment projections that drive trip forecasts that then result in the toll revenue projections. KABATA consultant CDM Smith projects far more population growth in Mat Su than any other source.

Source	Estimated Mat-Su Population in 2035	Includes all Borough?	Comments
AK Dept. of Labor	160,693 ¹⁴	Yes	Estimate of State Demographer
ISER, Institute of Social & Economic Research	159,050 ¹⁵	No	Basis of 2035 Anchorage Metropolitan Transportation Plan
CDM	191,656 ¹⁶	No	Extrapolated from CDM Smith traffic zone data

- Even with a much higher growth rate for Mat Su, CDM Smith’s prediction has put almost all future growth in the western part of the Borough away from the Palmer-Wasilla core to show the traffic necessary to make their financial projection work. To show high traffic counts, CDM Smith projected more jobs in 2035 at Point MacKenzie, the western terminus of the Bridge, than exist in either the Kenai or Juneau Boroughs today.¹⁷ The Mat-Su Borough has planned for the Port MacKenzie area to be dedicated to light manufacturing and industrial uses. Instead CDM Smith plunked down 1.7 million square feet of retail, or the equivalent of 2.4 Dimond Centers, the state’s largest mall, in an area being reserved by the Borough for tank farms and coal loading.¹⁸
- When CH2MHill modeled ISER’s Scott Goldsmith’s population and employment data, it projected 17,700 trips a day on the Bridge in 2035. KABATA’s estimate of toll revenue is based on a Bridge traffic forecast of 36,000 trips in 2035, or more than double the Goldsmith-CH2MHill number¹⁹.

You can’t fit 4 lanes of traffic on a 2 lane bridge. KABATA’s plans rely on “Impossibly Derived Revenue”

- A two lane restricted highway Bridge can serve a maximum of about 22,500 vehicles a day²⁰ which KABATA estimates occurs in 2026.²¹ (As a comparison, there are about 30,000 vehicles a day between Mat Su and Anchorage on the 4 lane Glenn Highway at Eklutna Flats.) But KABATA’s Financial Plan shows the revenue from over two lanes worth of traffic after 2026 but does not include of the cost of the Phase 1B expansion to 4 bridge lanes or Phase 2. KABATA indicates that the 4 lane expansion will happen in 2030 when it estimates 30,300 vehicles a day, but their Pro-Forma Financial plan does not show those costs. So within the 2026 to 2030 time period, the KABATA’s Financial Plan includes an extra \$70 million of impossibly derived revenue from 4 lanes of traffic crossing a two lane bridge. And after 2030, none of the costs of the expansion from 2 lanes to 4 lanes, or the Phase 2 connection to Ingra/Gambell are included in the Financial Plan although the revenue of a 4 lane Bridge is included in the Phase 1 plan that counts on the revenue of up to 48,000 vehicles a day (6 lanes) in 2051.²²
- An accurate financial plan would include one of two options:
 - Include the cost of Phase 2 which KABATA estimates at \$540 million (median Federal Highway Administration 2009 estimate \$815 million) to be on line in 2026, or
 - Not include Phase 1B and Phase 2 and cap revenue at the 2026 estimate of vehicle traffic with toll revenue only increasing with the 2.5% annual toll increase. The result is \$1.88 billion less cumulative toll

revenue than the \$4.23 billion in cumulative toll revenue to 2051 that KABATA projects.

- The final cost of expanding from 2 lanes to 4 lanes is not known, because we cannot predict interest rates in 2026, nor the exact amount of toll shortfall and the costs to finance the 2 lane to 4 lane expansion of Phase 1 and for Phase 2, which includes the connection to Ingra/Gambell. Therefore, it is not certain which of the above options would be least costly to the state. Under either option, the problem of 2 bridge lanes of cost and 4 lanes of revenue adds \$500 million to \$2 billion of additional cost to KABATA's Phase 1 budget.

To be consistent with other professional work cited above, (all from parties who have no interest in the Knik Arm Bridge project), a realistic toll estimate reduces cumulative toll revenue 2017-2051 by half from KABATA's \$4.232 billion to \$2.116 billion.

3. Higher Bridge Cost, Add \$80 Million

There are \$35 million of new costs as a result of a 1000' longer Bridge and the Anchorage Muni settlement to preserve more Port land by moving the 4 lanes into the cliff of unconsolidated and contaminated soils. Such amounts could be contained within the 15% or \$81 million in budgeted contingency funds. But it is imprudent to assess against the contingency such large ticket items before the project is even bid.

By KABATA's numbers, a billion dollar initial project results in \$2.3 billion in annual availability payments to the contractor, because the deficit between low toll revenue and high contractor payments must be financed, so interest must be paid on interest.²³ Using the same factor (2.3 times), a \$35 million costlier bridge results in total project costs increasing to \$80 million.

4. Lower Profit to Private Partner, Subtract \$123 Million from State Cost

KABATA's Financial Plan projects that it will pay out a total of \$738 million in net cash flow to the private investor in return for \$79 million of equity in the project or \$615 million in positive cash flow to the investor.²⁴ This 12% cumulative rate of return over 35 years is excessive given that the state guarantee (subject to annual legislative appropriations) largely removes the financing risk to the project and leaves the contractor with only the customary construction cost risk.²⁵ The state has traditionally paid no more than 10% when it has asked a contractor to front project costs. A 10% cumulative return would still be a \$615 million return or \$123 Million less than KABATA's estimate. *And why should a state with a AAA credit rating that can borrow long term around 3%, guarantee a 35 year contract paying even 10% ?²⁶*

The sum of these four items results in a total cost to the state of \$2,572,000,000 plus the \$X factor of geotechnical risk discussed above.

CONCLUSIONS

To summarize this paper to one critical question: *How will the Bridge's (\$2.6 Billion + \$X) deficit be paid for?*

Of that deficit, \$1.1 billion or an average \$58 million/year occurs between 2017 to 2035; \$1.5 billion will occur between 2036-2051. To finance these shortfalls, the legislature will have some combination of two bad choices:

1. Anchorage and Mat Su have together averaged about \$55 million a year in state and federal transportation funds for roads, trails, and mass transit through the past decade. **The Bridge deficits will dwarf that.** The State of Alaska in the past provided 18% of that transportation funding, the recently adopted 2035 Anchorage Metropolitan Transportation Plan (MTP), anticipating declining federal transportation revenues and earmarks, assumes that the state support will now jump to 54%. Because the percentage of State funding over Federal funding is anticipated to increase, competition will be fierce for Transportation money throughout the state. Before adopting the MTP Plan, the Anchorage Assembly on a 9-2 vote approved an amendment stating that Bridge deficits could not impact local transportation funding. While the amended MTP tries to fence off AMATS funds from Bridge funds, it is not clear how the MTP can guarantee that a future legislature will not cut funds to AMATS or Mat Su before they are passed on to local government. Depending on how disproportionately a future legislature might take Bridge deficits out of Southcentral transportation funding, the Anchorage and Mat Su transportation budgets will either be severely curtailed or decimated.
2. Alaska now has \$31,141 state debt per capita, the highest in the nation.²⁷ A \$2.6 billion bridge deficit totals over \$3500 for every current Alaska resident. If the legislature decides to put the estimated \$2.6 Billion + \$X deficit on the state debt service, Alaska is likely to retain our dubious #1 ranking to perennial contender Massachusetts. More importantly, future legislatures will have at least \$2.6 billion less for current needs as they dedicate that much to pay off past Bridge obligations that will be established if HB 23 and SB 13 are passed.

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¹ http://www.knikarmbridge.com/documents/KnikArmCrossingProFormaModel_000.pdf

² The Army Corps of Engineers has yet to issue a permit for the Bridge. However January, 2012 comments from the State of Alaska's Department of Fish and Game and federal resource agencies express continuing concern about the effect of 230 acres of proposed Bridge causeway fill would have on beluga whales and juvenile salmon forced into deeper waters. <http://knikbridgefacts.org/documents-relating-to-the-knik-bridge-project/#US>. So if the bridge is permitted, it's possible that the permit will be for between 9200' and 14400' with any

resulting increase over 9200' necessitating more piers needing to be installed in Knik Arm and so resulting in higher Bridge costs.

³ From December 27, 2012 letter from KABATA Exec. Director Niemiec to Sen. Ellis.

<http://knikbridgefacts.org/wp-content/uploads/2013/01/12.28.12-Response-to-Senator-Ellis-cost-estimate-inquiry.pdf>

⁴ <http://www.knikarmbridge.com/documents/FINALMarch2007Memo.pdf>

⁵ From December 27, 2012 letter from KABATA Exec. Director Niemiec to Sen. Ellis.

⁶ The final CH2MHill report is scheduled for release mid-February; this conclusion comes from the draft report now being circulated.

⁷ Audit request at: <http://www.legaudit.state.ak.us/pages/memos/30068audmemo.pdf>

⁸ P. 1 and 4

http://www.knikarmbridge.com/documents/KnikArmCrossingProFormaModel_000.pdf

⁹ http://www.knikarmbridge.com/documents/Knik_Arm_LOI_Response_9-25-12.pdf

¹⁰ The head of the federal TIFIA program recently wrote KABATA that even IF KABATA qualifies for a federal loan, it would be for a third of the project cost (\$300 M), not the 49% support (\$500 Million) KABATA recently unsuccessfully requested.

http://www.knikarmbridge.com/documents/Knik_Arm_Response_from_USDOT-12-11-12.pdf

¹¹ KABATA's estimate on toll revenues from the project have moved \$600 million in less than a year after traffic consultant CDM Smith revised projections downward. Compare the October, 2011 project budget <http://www.knikarmbridge.com/2011TIGER/ExhibitD.pdf> with the August, 2012 budget

http://www.knikarmbridge.com/documents/KnikArmCrossingProFormaModel_000.pdf. This \$600 million difference is four times the \$150 million "reserve fund" KABATA request. This analysis suggests that the legislators should focus more on the true cost of the unlimited state guarantee in HB 23/SB 13 rather than any amount for a loan fund which this analysis shows will never be paid back.

¹² The report criticizes Wilbur Smith's the overly optimistic toll projections for the Dulles Toll road expansion. An Appendix on the Knik Arm bridge project details the same unorthodox and undocumented methods for Wilbur Smith's population and toll projections on the Alaska project as the author sees by the KABATA consultant in the Virginia project

<http://www.scribd.com/doc/79582705/RCA-Study-Wilbur-Smith-Traffic-amp-Revenue-Forecasts-012712>.

¹³ <http://www.tollroadsnews.com/node/5726> and <http://www.tollroadsnews.com/node/4808>

. How is it possible that one of the nation's largest traffic and toll consulting firms can average overestimating future traffic and toll revenue by a factor of 2? CDM Smith's track record is not notably worse than the industry. Media reports make clear that the traffic projection industry serves clients who want to build tolled projects, not necessarily serve the interests of bond holders or units of government relying on the accuracy of the consultants work

http://www.denverpost.com/tollroads/ci_3876477. A Transportation Research Board study cites the "over optimism bias" to the industry which is even worse when the project accesses vacant land such as the north terminus of the Knik Arm project

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_364.pdf.

¹⁴p.46 <http://labor.alaska.gov/research/pop/projected/pub/popproj.pdf>

¹⁵ Both the ISER and CDM Smith number is for the AMATS area of Mat Su Borough so directly comparable P. 5-2

http://www.muni.org/Departments/OCPD/Planning/AMATS/2035%20MTP/AMATS%20Chapter-5_20120511_s.pdf

¹⁶ Remarkably, in 2011 CDM Smith *never stated a population number* for the Mat Su Borough. When the Technical Committee of AMATS, the Anchorage-state transportation planning body, urged CDM Smith to release the traffic zone data that served as the basis for their traffic forecast, those zones totaled 191,656 people. However, the TAZ zones left out the non-AMATS areas of the Borough north of Willow and east of Chickaloon. That area contained 3,823 people of the Borough's 88,995 people counted in the 2010 Census. Extrapolating that same share of population in 2010 as 2035, CDM Smith's 191,656 in 2035 for the partial area of the Borough becomes 200,259 for the full Borough. In 2007 KABATA hired Scott Goldsmith of ISER to estimate Mat Su population in 2030. Scott's number of 204,400 proved too low for KABATA purposes so KABATA then hired a small firm of Insight Research Corporation of Dallas, Texas who produced a number of 250,700.

<http://www.knikarmbridge.com/documents/IndependentEconomicOverviewandDevelopmentForecast07022007.pdf>. Since then both ISER as well as KABATA consultant CDM Smith have reduced the Borough's projected growth rate but the CDM Smith numbers have been consistently 20-30% higher than non-KABATA sources.

¹⁷ <http://knikbridgefacts.org/13828-jobs-at-point-mackenzie-in-2035-release-of-traffic-analysis-zone-data-raises-more-questions-on-kabata%E2%80%99s-revenue-projections/>

¹⁸ <http://knikbridgefacts.org/point-mackenzie-tank-farms-and-coal-loading-or-2-4-diamond-centers-of-retail/>

¹⁹ It took extensive discussions and two rounds of Public Record Act requests for this data to be released. The authors have a map with the 17,700 Bridge trips a day in 2035 that was generated for the Highway to Highway project.

²⁰ National Transportation Research Board, Highway Capacity Manual 2010

²¹ Table 1 from KABATA's revised Toll & Revenue Forecast from their August 2012 TIFIA LOI.

<http://www.knikarmbridge.com/documents/MemoforAugust2012TandRforecastupdated8.23.2012.pdf>

²² Consider what the legal consequences might be to a private business person submitting loan documents to a bank which misleadingly shows the revenue from a business being expanded to twice its size without showing the cost of doubling the firm's space to earn that extra revenue. KABATA has always been clear that Phase 1 will construct a 2 lane Bridge with the superstructure to later add 2 lanes in what they are now calling Phase 1B (The new Phase 1A and Phase 1B do not exist in KABATA's EIS or the FHWA Record of Decision). But despite pointing out to KABATA (at multiple public hearings) that showing toll revenue from traffic that will only fit on 4 lanes, while including only 2 lanes of cost is misleading at best, KABATA continues to submit a letter of interest loan applications to the Federal TIFIA loan program that includes those same errors.

²³ P. 3 http://www.knikarmbridge.com/documents/KnikArmCrossingProFormaModel_000.pdf. KABATA's own financial plans (p. 6) shows that bridge costs will exceed bridge revenue for the first nine years the Bridge is open, even with the annual contractor payments being held down in early years so annual payments balloon from \$25 million in year one to \$104 million in year 35. Such deals where the principal owed grows instead of declines in early years are called negative equity or negative amortization and at least in the housing market, banks wisely no longer finance those types of deals. When the state finances capital projects by selling bonds, the

amount of principal owed each year declines over time. So why should the state get into the additional interest costs of a negative amortization deal now?

²⁴ P. 4 http://www.knikarmbridge.com/documents/KnikArmCrossingProFormaModel_000.pdf.

²⁵ Perhaps the biggest misnomer in the selling of the Knik Arm bridge project is KABATA's continual claim that the developer will "finance" the project. This is technically true but completely misleading since it is the *state that bears the full downside risk of the project*. If HB 23/ SB 13 passes, with its unlimited guarantee to cover the toll shortfalls while making 35 years of contractor payments, then the developer will take that contract with a AAA credit state to a Wall Street rating firm which will then provide the investment grade rating necessary to sell the bonds. While the developer will technically sell the bonds, in reality it is HB 23 / SB 13 and their state guarantee that allows that investment grade necessary to meet the statutory test of a market rate. So in effect, if the legislature passes HB 23 / SB 13, it will be substituting its own review (or lack thereof) on whether or not KABATA's traffic and toll forecasts are valid. Would it not be better to rely on the market-based judgment of a private firm to see if they are willing to risk their own capital on both the cost of the bridge and the reliability of the toll revenue forecast? CDM Smith has provided "investment grade" projections to some projects, but in 2011 Wilbur Smith submitted their Toll & Revenue forecast to KABATA with the following disclaimer, "The results contained in this report are not intended to be used to secure or obtain project financing and should be used for planning purposes only." P. 48

<http://www.knikarmbridge.com/2011TIGER/T&RStudy.pdf>

If the state is guaranteeing that the annual "availability Payments" will be paid to the developer, regardless of the amounts of Toll revenue received, and the traffic consulting firm will not allow its report to be used to obtain financing, why should the legislature substitute its judgment for the private sector's?

Where are the results of the **2012 LB&A Audit** that was tasked with evaluating the reasonableness of KABATA's Toll and Revenue Forecasts? If HB 23 / SB 13 passes in its current form, the state takes on the full downside risk on the amount of annual payments, and the private sector has the upside of a 35 year 10-12% return.

²⁶ The KABATA Financial Plan shows the public-private partnership (P3) deal structure costs the project an extra \$665 million (\$738 million in net cash flow to contractor minus \$73 million equity). Anchorage's Mayor Sullivan supports the project but questions the more expensive P3 structure. So rather than have the state directly finance the project by selling bonds using its AAA credit at 3%, why add an extra \$300-500 million of additional cost to finance the project at 10-12% cost? One possible explanation for KABATA's preference for the higher cost P3 structure is that without the P3 structure KABATA would have to admit that the project will not pay for itself and the project's billion dollar cost must compete with other state projects in the state's transportation and capital budget.

²⁷ <http://www.statebudgetsolutions.org/publications/detail/state-debt-more-than-37000-per-private-worker-13000-per-capita>