



**KNIK ARM CROSSING
GRAVEL FINDINGS
TECHNICAL
REPORT**

Agreement No: P 42070
Federal Project No:
ACSTP-0001(277)
AKSAS Project No: 56047

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January 2006

Table of Contents

1.0 Introduction 2

2.0 Project Description 2

 2.1 Description of the Proposed KAC Project Study Area 3

 2.2 Alternatives 6

 2.3 Preferred Alternative 6

3.0 Gravel Requirements 7

4.0 Potential Sources 8

 4.1 Point MacKenzie Sources 8

 4.1.1 Point MacKenzie Elmendorf Moraine 8

 4.1.2 Knik Gravel Pit 8

 4.1.3 7.5 Mile Pit..... 8

 4.1.4 Northern Pacific Industries 8

 4.2 Anchorage Sources..... 8

 4.2.1 Elmendorf Air Force Base and Fort Richardson Pits..... 8

 4.3 Valley Sources..... 8

 4.3.1 Central Paving Products..... 9

 4.3.2 Quality Asphalt Paving 9

 4.3.3 Anchorage Sand & Gravel..... 9

List of Figures

Figure 2.1. Proposed KAC Project Route 3

Figure 2.2. KAC Draft EIS Study Area..... 5

Appendices

Appendix A Map of Gravel Sources

Abbreviations and Acronyms

ADOT&PF	Alaska Department of Transportation and Public Facilities
AS&G	Alaska Sand & Gravel
Anchorage	Municipality of Anchorage
CPP	Central Paving Products
EAFB	Elmendorf Air Force Base
EIS	Environmental Impact Statement
Elmendorf	Elmendorf Air Force Base
FHWA	Federal Highway Administration
Fort Richardson	Fort Richardson Military Base
KABATA	Knik Arm Bridge and Toll Authority
KAC	Knik Arm Crossing
Mat-Su	Matanuska-Susitna
MOA	Municipality of Anchorage
NEPA	National Environmental Policy Act
NFS	Non-Frost Susceptible
NPI	Northern Pacific Industries
POA	Port of Anchorage
QAP	Quality Asphalt Paving

Executive Summary

The following report discusses general gravel requirements and potential gravel sources for the proposed Knik Arm Crossing. There are a number of existing gravel pits on the Railbelt that could provide gravel for the project. There also are potential gravel sites on the west side that could be developed to provide materials for the project if needed.

1.0 Introduction

This Technical Report provides documentation of gravel findings, in the Matanuska-Susitna Borough (Mat-Su) and the Municipality of Anchorage (Anchorage) that would be affected by the proposed Knik Arm Crossing (KAC) project. The Federal Highway Administration (FHWA) is preparing a Draft Environmental Impact Statement (EIS) as part of the National Environmental Policy Act (NEPA) process to evaluate a Knik Arm crossing sponsored by the Knik Arm Bridge and Toll Authority (KABATA). This Technical Report is limited to the Study Area and to the alternatives further evaluated in the EIS. The Study Area, the proposed alternatives, and the projected impacts from their implementation are described below.

2.0 Project Description

More than 80 years of transportation, land use, and economic plans and studies for the Upper Cook Inlet region of Alaska have addressed the need for a Knik Arm crossing project to connect Anchorage with the Mat-Su.

In 2003, the Alaska State Legislature established the Knik Arm Bridge and Toll Authority (KABATA) as a public corporation and an instrumentality of the State of Alaska within the Alaska Department of Transportation and Public Facilities (ADOT&PF). The specific mission of KABATA is to "... develop, stimulate, and advance the economic welfare of the state and further the development of public transportation systems in the vicinity of the Upper Cook Inlet with construction of a bridge to span Knik Arm and connect the Municipality of Anchorage and the Matanuska-Susitna Borough." (Alaska Statutes chapter 19.75)

In accordance with this mission, the purpose of the proposed KAC project would be to provide improved access and connectivity between Anchorage and the Mat-Su through an efficient and financially feasible crossing of Knik Arm, including adequate connections to the committed roadway network on both sides of Knik Arm. A Knik Arm crossing would:

- improve regional transportation infrastructure to meet existing and projected population growth in Upper Cook Inlet
- enhance the movement of people, freight, and goods between Anchorage, the Mat-Su, and Interior Alaska
- offer safe, alternative connections between regional airports; ports; hospitals; and fire, police, and disaster relief services for emergency response and evacuation

The proposed bridge crossing of Knik Arm would be located approximately 1.25 miles north of Cairn Point and would span approximately 2.5 miles (see Figure 2.1). The roadway connection on the Mat-Su side of Knik Arm would be Point MacKenzie Road near the Port MacKenzie District. The roadway connections on the Anchorage side of Knik Arm would be the A-C and Ingra-Gambell Couplets, generally in the Port of Anchorage (POA)/Government Hill/Ship Creek area. The total length of the project from

the intersection of Point MacKenzie and Burma Roads to the intersections of the A-C and Ingra-Gambell Couplets with Third Avenue would be approximately 19 miles.

Design and construction features of the proposed KAC project would include, among other details:

- a toll plaza
- a rural principal artery
- phased construction

The proposed project would be a controlled access toll facility with a toll plaza located in the Mat-Su near the western bluff of Knik Arm. The proposed project would be classified as a rural principal arterial in the Mat-Su and across Knik Arm, transitioning to an urban principal arterial in Anchorage in the vicinity of the POA. The proposed project would be phase-constructed as travel demand would warrant and would be anticipated to generally be an initial two-lane facility with expansion to a four-lane facility by the design year 2030. Initial construction would include a connection to the existing A-C Couplet on the Anchorage side and, by approximately 2022–2025, a connection to a new viaduct (elevated bridge) across the Ship Creek rail yard to connect with the Ingra-Gambell Couplet.

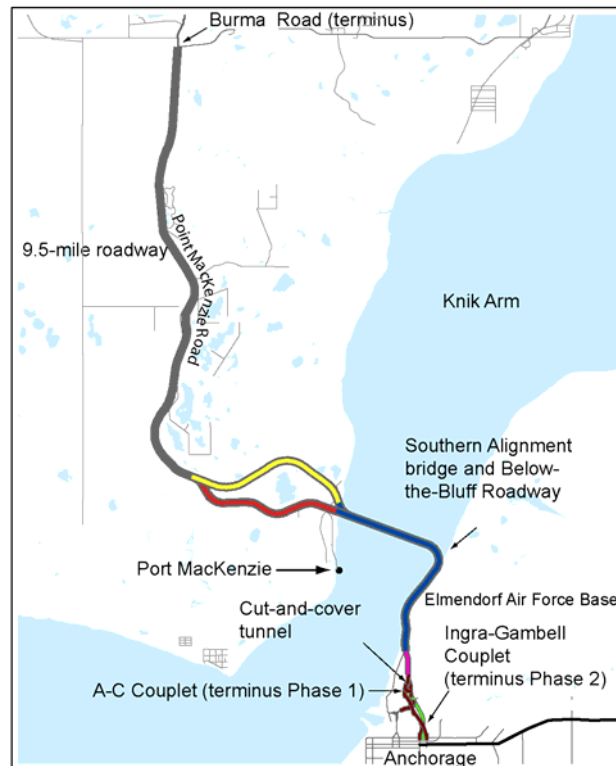


Figure 2.1 shows that the proposed project begins at Burma Road and ends in Downtown Anchorage. Components common to all routes being considered are also identified.

Right-of-way (ROW) widths for the project would vary by specific design element. The proposed project ROW in the Mat-Su would be approximately 400 to 450 feet in width. In the Anchorage portion of the proposed project, the ROW would be approximately 260 feet along the east shore of Knik Arm down to the future expansion of the POA, then vary from 200 to 350 feet as it passed behind the port. As it climbed Government Hill, the ROW would expand to 985 or 585 feet wide to accommodate a cut-and-cover tunnel and access points along either a Degan Street- or Erickson Street-area alignment, respectively. Continuing southward it would cross the Ship Creek rail yard along an approximately 80-foot-wide, pier-supported viaduct ending at Third Avenue, the proposed project terminus.

2.1 Description of the Proposed KAC Project Study Area

The Study Area for the proposed KAC project is located within the boundaries of Anchorage and the Mat-Su in the Upper Cook Inlet region of Southcentral Alaska

(Figure 2.2). The Study Area has a combined population of nearly 350,000, which represents over 50 percent of Alaska's total population. The Anchorage and Mat-Su portions of the Study Area are separated from one another by Knik Arm, a 30-mile-long waterway, which varies in width from 2 to 6 miles. Anchorage is located approximately 3 miles across Knik Arm from Port MacKenzie and the adjacent Port MacKenzie District.

Although the physical separation between these two areas consists of a short span of waterway, the only current surface transportation access between Anchorage and the Port MacKenzie District (Port District) is by 80 miles of existing roadway around the head of Knik Arm.

Located along the eastern shore of Knik Arm, Anchorage encompasses 1,961 square miles, 84 percent of which is occupied by National Forest, State Parklands, and tidelands, with an additional 6 percent occupied by military reservations. Only about 10 percent of the entire municipality is inhabited and available to accommodate existing and future growth. Most residents of Anchorage live in the Anchorage Bowl, the most urbanized portion of the municipality. The Anchorage Bowl occupies approximately 112 square miles and is bounded by Chugach State Park, Knik and Turnagain Arms, Elmendorf Air Force Base (Elmendorf), and Fort Richardson Military Base (Fort Richardson). Anchorage residents outside the Anchorage Bowl live either further north in the suburban communities of Chugiak-Eagle River or in small residential areas along the Glenn Highway and Turnagain Arm. Also located within this portion of the Study Area are the POA—a vital intermodal facility—and the adjacent Ship Creek industrial area.

On the western shore of Knik Arm, the Mat-Su consists of an area of 24,683 square miles, which encompasses approximately 23 percent of all private land in the state of Alaska. Because there is a substantial amount of undeveloped land available in the Mat-Su, the area provides an alternative to more costly and limited residential, commercial, and industrial lands within Anchorage. This availability has resulted in numerous changes that have recently occurred or will be occurring in the Mat-Su, including construction of Port MacKenzie in the late 1990s, existing and planned expansion of the connecting transportation network to and from Port MacKenzie, and planned development of the 9,000-acre Port District. The Mat-Su Borough is also developing a ferry link between Port MacKenzie and the POA; the ferry is projected to begin operation in 2008.

2.2 Alternatives

The proposed KAC project would begin at the intersection of Point MacKenzie and Burma Roads and follow the existing roadway alignment south to the western boundary of the Port District. From here, there would be two alternative routes for getting to the proposed bridge crossing. The proposed Point MacKenzie Road Alternative would use the existing Point MacKenzie Road most of the way through the Port District before deviating from the established road and heading toward the proposed bridge crossing near the western bluff. The proposed Northern Access Alternative would skirt the core port area on the north side on a new alignment. With either proposed alternative, there would be a toll plaza and intersection/access road to allow access to and from Port MacKenzie.

The proposed bridge would be within the Southern Alignment, a corridor beginning approximately 1,500 feet south of Anderson Dock on the Mat-Su side and ending 1.25 miles north of Cairn Point on the Anchorage side. The crossing structure would be either 8,200 or 14,000 feet long. The Southern Alignment also includes the eastern bridge abutment, where the proposed Anchorage approach road would travel southwest on fill along the tidelands and below the bluff (termed the proposed “Below-the-Bluff Roadway”), toward Cairn Point, then turn southward, closely following the natural curve of the shoreline.

From this point the proposed roadway would parallel the eastern boundary of the POA, where the route would connect to the existing A-C Viaduct and the proposed Ingra-Gambell Viaduct by way of either of two routes: the Degan Alternative or the Erickson Alternative. The proposed Degan Alternative would follow the alignment of Degan Street through a cut-and-cover tunnel that would initially connect to East Loop Road with an at-grade, T-intersection (Phase 1). As travel demand would warrant, the route would continue on the proposed new Ingra-Gambell Viaduct over the Ship Creek rail yard before tying into the Ingra-Gambell Couplet at 3rd Avenue. At that time, Loop Road would be elevated over the proposed KAC route to provide access to Government Hill and Elmendorf. The proposed Erickson Alternative would be similar, but the cut-and-cover tunnel would align with Erickson Street and connect directly into Loop Road in Phase 1 (ramps would continue to provide access to Government Hill and Elmendorf). In Phase 2, when travel demand would warrant, the route would continue in a parallel cut-and-cover tunnel under Erickson Street onto the proposed Ingra-Gambell Viaduct, tying into the Ingra-Gambell Couplet at 3rd Avenue.

2.3 Preferred Alternative

FHWA screened the range of alternatives against criteria for purpose and need and technical criteria to identify reasonable alternatives for detailed study in the Draft EIS. Based on these screening criteria and subsequent detailed evaluations, FHWA has identified a Preferred Alternative.

The preferred approach route to the proposed Knik Arm Bridge from the Mat-Su side is the Northern Access Alternative: Point MacKenzie Road from its intersection with

Burma Road, south to the Port District, and connecting through to the Port District along the northern alignment. FHWA chose this route because it would avoid wetlands, would not impact Port MacKenzie operations, and is favored by Mat-Su Borough and Port MacKenzie officials.

The proposed Southern Alignment is the preferred route for the bridge to cross Knik Arm. The Southern Alignment, with its accompanying proposed Below-the-Bluff Roadway on the Anchorage approach, would be the most technically feasible and practical alignment that would avoid the Cairn Point Trench (a submarine trough), would not affect military mission and operations at Elmendorf, and would minimize potential impacts to beluga whales that congregate in areas of Knik Arm further to the north.

An 8,200-foot-long pier-supported bridge is preferred over a 14,000-foot-long pier-supported bridge because, in addition to lower construction costs, a shorter bridge would require fewer piers—meaning shorter in-water construction time and, therefore, less construction noise and pile-driving impacts that might adversely affect beluga whales and marine fishes.

The preferred Anchorage approach to the proposed bridge would be a cut-and-cover tunnel under Government Hill, using either the proposed Degan or Erickson Alternative to connect initially to the existing A-C Couplet and, in Phase 2, to the Ingra-Gambell Couplet.

All reasonable alternatives evaluated in the Draft EIS are under consideration and have been developed to a comparable level of detail. Final identification of a Preferred Alternative will not occur until the alternatives, impacts, written comments on the Draft EIS, and comments received at the public hearings have been fully evaluated and considered. The final Preferred Alternative will be provided in the Final EIS.

3.0 Gravel Requirements

Because there are a number of different construction areas for the proposed Knik Arm Crossing project, the specific gravel requirements for different areas would be equally varied. The proposed bridge crossing causeway core material might require coarse material or even shot-rock fill where tidal currents are high. Other +20 feet causeway and shore-side embankment fill requirements might be limited only by what contractors can place and compact.

Materials are expected to be uniform, hard, durable, and nonplastic. They should also be free of clay, organics, contaminants, and other deleterious matter.

Screening operations might need to be provided to meet specific design or construction requirements. There are a number of in-the-pit sources with varying gradations, such as typical NFS materials, without the need for screening or washing.

4.0 Potential Sources

See Appendix A for locations of each of the mentioned pits and their proximity to the proposed Knik Arm Crossing bridge site.

4.1 Point MacKenzie Sources

4.1.1 Point MacKenzie Elmendorf Moraine

The Point Mackenzie Elmendorf Moraine within the port district is estimated to contain up to 40 million cubic yards of material (Shannon & Wilson 2003). The material could potentially be moved by conveyor to the proposed bridge alignment or existing dock site, providing a significant cost saving. Boreholes of the site show some variation in material. Most of the material appears to be fine-grained silty-sands and sandy-silts. The high silt content material would likely not be appropriate for in-water or wet placement. This land is owned by the Mat-Su Borough and the University of Alaska.

4.1.2 Knik Gravel Pit

Owned by Bill Prosser and operated by Denali Materials, this gravel pit is reported to contain between 6 million and 9 million cubic yards of material. The location of the pit allows the material to be readily transported by barge. The material is low in fines but has a high sand content, which is screened out before transport.

4.1.3 7.5 Mile Pit

The Mat-Su Borough reportedly has a number of potential gravel pit locations, including the 7.5 Mile Pit, having significant quantities of good-quality coarse gravel. No information is currently available on the locations or material specifics for these other potential pits.

4.1.4 Northern Pacific Industries

Northern Pacific Industries (NPI) has a lease on the land across the road from the 7.5 Mile Pit. This location reportedly contains quality gravel, although no specifics are known at this time.

4.2 Anchorage Sources

4.2.1 Elmendorf Air Force Base and Fort Richardson Pits

Inquiries have been made regarding established pits at Elmendorf Air Force Base (Elmendorf) and Fort Richardson Army Post (Fort Richardson). Neither the Air Force nor the Army has responded to date.

4.3 Valley Sources

The Mat-Su valley sources mentioned have the distinction of being large, established pits with rail access. It is reported that each of these pits exports in the range of 80 rail cars of gravel to Anchorage every day in the summer months.

4.3.1 Central Paving Products

The Central Paving Products (CPP) pit, along with those of Quality Asphalt Paving (QAP) and Anchorage Sand & Gravel (AS&G), is located at Milepost 38.5 of the Glenn Highway in Palmer. There are reported to be tens of millions of yards of available material in this pit.

4.3.2 Quality Asphalt Paving

In addition to its pit in Palmer, QAP has a pit in Wasilla near the intersection of Vine Street and the Parks Highway. The material from these pits reportedly meets the State's Borrow A (NFS) specification. There is reportedly more than 12.4 million cubic yards of material available in these pits.

4.3.3 Anchorage Sand & Gravel

This pit is reportedly estimated to contain 6.2 million cubic yards of material above the water table and 12.4 million to 18.6 million cubic yards of material below the water table. Twelve-inch-minus material is transported from Palmer by rail to AS&G's Klatt Road Terminal in Anchorage, where the material is then crushed down to a 4-inch-minus material.