



**PEBBLE PROJECT
ENVIRONMENTAL BASELINE DOCUMENT
2004 through 2008
(with updates in 2010)**

**CHAPTER 19.
TRANSPORTATION
Bristol Bay Drainages**

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ACRONYMS AND ABBREVIATIONS

ADOT&PF	Alaska Department of Transportation and Public Facilities
FHWA	Federal Highway Administration
IDC	Iliamna Development Corporation
L&PB	Lake and Peninsula Borough
SWATP	<i>Southwest Alaska Transportation Plan</i>

19. REGIONAL TRANSPORTATION

19.1 Introduction

This chapter describes existing and planned inter- and intra-regional overland, water, and air transportation facilities and services for the communities in the Lake and Peninsula Borough (L&PB) nearest to possible Pebble Project facilities.

19.2 Study Objectives

The study objective was to document existing and proposed overland, water, and air transportation facilities and services in the study area. (For this chapter, the terms “proposed” or “planned,” in reference to transportation facilities, pertain to facilities being considered or undertaken by federal, state, or local governments.)

19.3 Study Area

The transportation study area in the Bristol Bay drainages focuses mainly on the eight L&PB communities nearest to possible Pebble Project facilities (Figure 19-1). These eight communities—Igiugig, Iliamna, Kokhanok, Levelock, Newhalen, Nondalton, Pedro Bay, and Port Alsworth—are referred to herein as the study-area communities. This chapter also presents information about selected transportation facilities and services in the larger Bristol Bay area, termed the regional study area.

19.4 Scope of Work

The scope of the study includes overland, water, and air transportation modes. It documents trends in the volume of air passenger and airfreight traffic based on data available as of 2009 and prevailing air transportation costs as of April 2010. It also provides information about travel distances and current travel costs to Iliamna from other L&PB communities, and from other regional transportation hubs in southwest and southcentral Alaska through which employees who reside elsewhere in the regional study area may travel to work in the Iliamna vicinity. Kevin Waring Associates conducted the work.

19.5 Methods

This study is descriptive in nature. The study methods relied mainly on distillation of information from existing transportation studies, regional plans, and data sources to describe existing and planned or proposed transportation facilities and services. These sources are listed in Section 19.8, References. Because air transportation is vitally important to the study-area communities, data on air passenger and freight traffic were compiled to provide a baseline of passenger and freight activity. Finally, representatives of several transportation service providers were interviewed to supplement published reports and unpublished transportation data sources.

19.6 Results and Discussion

This section first inventories existing regional transportation facilities and services in the study area by mode: overland, water, and air. Then, recent and ongoing regional transportation studies and plans that address proposed transportation improvements for the study area are examined.

19.6.1 Existing Regional Transportation Facilities and Services

The L&PB region is characterized by small, remote, inland settlements; low passenger and freight volumes; great distance from major population and distribution centers; limited and circuitous water access; and rugged, environmentally sensitive terrain. These characteristics pose economic, engineering, and environmental obstacles to the development of extensive overland and water transportation infrastructure. They have limited the options for transportation services into and within the region. As a result, existing overland and water transportation infrastructure is spotty and is restricted to a few situations where special local circumstances have warranted development. By default, air transportation is the primary mode for moving people and goods to, from, and within the study area.

19.6.1.1 Overland

The study-area communities are not connected by interregional roads to other areas of southwest or southcentral Alaska. There are no rail facilities or non-local pipelines. Snow machines and all-terrain vehicles are commonly used for local travel where and when surface conditions allow.

The limited opportunities for intra-regional and local vehicular transportation in the study-area communities are reflected in generally low rates of ownership of motor vehicles. According to the 2000 decennial census (ADOL&WD, 2002), the following percentages of households in the subject communities owned motor vehicles:

- 18 percent in Levelock.
- 22 percent in Pedro Bay.
- 25 percent in Igiugig.
- 37 percent in Kokhanok.
- 38 percent in Nondalton.
- 51 percent in Port Alsworth.
- 56 percent in Newhalen.
- 93 percent in Iliamna.

For comparison, 94 percent of households in Anchorage and 89 percent statewide owned motor vehicles in 2000.

The Iliamna/Newhalen area has the most extensive road system among the study-area communities. Even so, road miles, traffic volumes, and vehicle miles traveled are low (Table 19-1). In 2008, the average daily traffic counts for the three busiest road segments in the Iliamna/Newhalen area were 260 vehicles for the

Iliamna Village Spur Road, 210 vehicles for the Newhalen Village Road, and 160 vehicles for the Iliamna-Nondalton Road (ADOT&PF, 2009a).

There are only three intra-regional roads in the regional study area:

Williamsport-Pile Bay Road

The Williamsport-Pile Bay Road is the only publicly maintained road in the study area. It is a 15.03-mile unpaved one-lane state road between Williamsport at Iliamna Bay on west Cook Inlet and Pile Bay at the eastern end of Iliamna Lake. It was developed in the 1920s and 1930s by the Alaska Road Commission to accommodate prospectors' need to transport machinery to the Iliamna Lake region (Naske, 1986). The Williamsport-Pile Bay Road roadbed is on a 100-foot-wide state right-of-way. Approximately 13 miles of the Williamsport-Pile Bay Road are in the Bristol Bay drainages study area west of the divide between the Bristol Bay and Cook Inlet drainages, and approximately 2 miles are in the Cook Inlet drainages study area. The road section from Williamsport to the divide is subject to severe avalanche hazard. Figures 19-2A, 19-2B, and 19-3 show aerial views of the Williamsport-Pile Bay Road corridor and the Pile Bay landing.

The Williamsport-Pile Bay Road was traditionally used to transfer commercial fishing vessels and gear between Cook Inlet and Iliamna Lake and then to/from Bristol Bay fishing communities accessible via by Iliamna Lake and the Kvichak River. Before 2009, the Williamsport-Pile Bay Road was also used to truck limited amounts of freight from the Williamsport barge landing to the Pile Bay landing. From there, freight was barged to Iliamna Lake communities by Igiugig Transport, which operates a lake-barge service to distribute freight from Pile Bay to Iliamna Lake destinations. (The Iliamna Lake communities do not include Nondalton and Port Alsworth, which are not accessible by water from Iliamna Lake.) In 2009, Iliamna Development Corporation (IDC) started a new combination barge-road-barge service to ship fuel and freight from Homer to Iliamna Lake communities. In summer and fall of 2009, IDC trucked approximately 22 barge loads of bulk fuel and freight from Williamsport to Pile Bay for forwarding by barge to Iliamna and other Iliamna Lake communities (Klouda, 2009).

The Williamsport-Pile Bay road is not maintained in winter. It is usually open for seasonal use between June and November. The Alaska Department of Transportation and Public Facilities (ADOT&PF) estimates that average daily traffic count for the road in 2008 was 10 vehicles (ADOT&PF, 2009a).

In 2009, the ADOT&PF completed improvements to the Williamsport-Pile Bay Road. The improvements consisted of drainage repairs, culvert installation and replacement, erosion protection, 12-inch grade raise, and road widening (to 14 feet) with turnouts, ditching, and signing from milepost 3 to milepost 9. As of 2010, there were no further improvements planned for the road.

Additional information on the use of the Williamsport barge landing and the Williamsport-Pile Bay Road can be found in Chapter 47.

Iliamna and Newhalen Village Roads

The Iliamna Village Road and Newhalen Village Road, both paved, link these two communities to Iliamna Airport and to each other (Figure 19-4).

Iliamna-Nondalton Road

The unfinished state Iliamna-Nondalton Road extends 14.4 miles from Iliamna Village Road to the east bank of the Newhalen River, across the river from and approximately 2.3 miles short of Nondalton (Figure 19-5). A restricted-access spur road about 10 miles north of Iliamna provides access to the Tazimina Hydroelectric Project.

For many years, the State of Alaska has been pursuing the Iliamna-Nondalton road and bridge project to develop an improved road surface and construct a bridge across the Newhalen River to connect Iliamna/Newhalen and Nondalton. The L&PB has supported the project, but it is controversial in Nondalton. The project has been stalled for several years by state and federal litigation, the resolution of which required a new environmental evaluation. The status of the project is described more fully below in Section 19.6.2.2.

Other Central Alaska Peninsula Roads

There are three other non-local roads in the central Alaska Peninsula, but outside the study-area communities:

- King Salmon-Naknek Road: this 15.3-mile-long state road connects King Salmon and Naknek.
- King Salmon-Naknek Lake Road: this unimproved road extends from King Salmon about 8 miles to a landing on the Naknek River near the outlet of Naknek Lake.
- Brooks Camp-Three Forks Overlook Road: within Katmai National Park, a 24-mile-long gravel road connects Brooks Camp to the Three Forks Overlook of the Valley of the Ten Thousand Smokes. This road is used mainly for scenic bus tours originating at Brooks Camp.

19.6.1.2 Water

Shipping Routes

There are two avenues of access for waterborne transportation to the Iliamna Lake communities. The Kvichak River provides access to Iliamna Lake from Bristol Bay and the ports of Naknek and Dillingham. The Williamsport-Pile Bay Road connects the Williamsport landing on Cook Inlet to the Pile Bay landing on east Iliamna Lake, from which lake barges can carry cargo to Iliamna Lake destinations.

Traditionally, the Port of Naknek in Bristol Bay was the main landing and transfer point for waterborne cargo bound from Seattle or Anchorage to the Iliamna Lake communities. Inbound dry cargo and fuels were off-loaded at Naknek, then transferred to shallow-draft barges and barged up the Kvichak River to Iliamna Lake. This route gave access to Igiugig, Iliamna, Newhalen, Kokhanok, and Pedro Bay, as well as to riverside lodges and other remote destinations along the way. Barges were not able to navigate the Newhalen River and thus did not deliver to Nondalton or Port Alsworth. Waterborne cargo for Nondalton was off-loaded at Iliamna and forwarded overland and across Sixmile Lake to Nondalton.

River conditions—freeze-up in winter and occasional low water in summer or fall—limited the window of access for barge traffic on the Kvichak River. Generally, the shipping season extended from late July to the end of September. Waterborne transportation rates were generally lower than airfreight rates, and

waterborne transport via the Kvichak River was the most practical and economical alternative for delivery of bulk cargo to accessible locations.

Several years prior to 2009, low water levels and river shoals made the traditional river barge route up the Kvichak River to Iliamna Lake infeasible, disrupting the traditional barge delivery system. For several years, this necessitated costly air delivery of bulk cargo and fuels to Iliamna Lake communities. In summer 2009, a new shipper, IDC, began service to the Iliamna Lakes communities. IDC shipped freight and fuels by contract barge from Homer to Williamsport, to be trucked over the Williamsport-Pile Bay Road and then barged to Iliamna Lake destinations. By this route, IDC was able to deliver bulk cargo and fuels more economically than air delivery. As further described in Chapter 47, several other barge delivery and trucking companies also make limited use of the Williamsport-Pile Bay Road to transship cargo to Iliamna Lake communities.

Because facilities for repair or storage of boats are limited in Bristol Bay, some fishing-boat owners send their vessels to Homer for repair or storage after fishing season. Fishing boats can travel under their own power from Bristol Bay to Pile Bay on the east end of Iliamna Lake. The Williamsport Bay-Pile Bay Road is a practical and cost-effective route for transferring fishing vessels from Pile Bay to Cook Inlet where vessels can again travel under their own power to Homer. This process can be reversed to send fishing boats to Bristol Bay in advance of fishing season. This route shortens the hazardous 1,100-mile marine route between Bristol Bay and Homer via the southern tip of the Alaska Peninsula. The Williamsport landing operator estimated that approximately 50 fishing boats are transferred between Cook Inlet and Pile Bay yearly.

Fishing boats, skiffs, and recreational craft freely travel the region's inland waterways. In addition to personal transport, they also may carry small volumes of goods.

Dock Facilities

There are limited facilities for delivery of cargo and fuel and for similar purposes in the study-area communities.

- Iliamna has a public dock that was built in the mid-1980s. The base of the dock structure has been damaged by currents and undertow from Iliamna Lake and is in need of repair (L&PB, 2002). The lack of serviceable dock facilities is a constraint on barge service.
- Newhalen lacks dock facilities. Waterborne bulk cargo is lightered ashore, and bulk fuel is transferred ashore with pipelines.
- Nondalton is not accessible to intra-regional barges—the Newhalen River is not navigable by barge between Iliamna/Newhalen and Nondalton—and has no dock facilities. Waterborne cargo bound for Nondalton is off-loaded at Iliamna and forwarded to a location on Sixmile Lake opposite Nondalton. Then cargo is either carried by small boat across Sixmile Lake or, when conditions permit, by vehicle over ice.
- Igiugig has a small boat ramp, but lacks dock facilities.
- Kokhanok lacks dock facilities. Inbound cargo is lightered or piped ashore.
- Levelock relies mainly on a beach landing for unloading barge-delivered cargo and fuel. Its riverfront dock needs improvements to enable barge delivery.

- Pedro Bay has a boat landing, but lacks dock facilities.
- Port Alsworth lacks a public dock. Located on Lake Clark northeast of Nondalton, Port Alsworth is not accessible for intra-regional inbound waterborne traffic. As with Nondalton, light cargo can be forwarded to Port Alsworth by small boat from the landing at Sixmile Lake.

Barge Services

Crowley Maritime purchased Yukon Fuel Company's general-cargo and bulk-fuels distribution business in 2005, becoming the primary marine carrier to the Iliamna Lake communities until the entry of IDC. (Northland Services provides barge service from Seattle and Anchorage to Naknek, and redistributes dry cargo and bulk fuels to western Alaska, but not to Iliamna Lake communities). Crowley provides service from Seattle and Anchorage to its terminal at Naknek. From there, Crowley can deliver both dry cargo and bulk petroleum fuels to Iliamna Lake communities. Crowley has a 258,000-gallon tank farm at Iliamna Airport from which it can supply air carriers and other fuel distributors, as well as local consumers. However, low water levels and shoaling on the Kvichak River have interrupted service for several years, and it is uncertain whether and when this route will be re-opened.

IDC and Igiugig Transport operate a lake-barge service to forward marine cargo from the Pile Bay landing to Iliamna Lake communities and between the communities.

The Alaska Marine Highway System does not serve any of the study-area communities.

19.6.1.3 Air

Air transportation is the primary means of inter- and intra-regional passenger travel for residents of the study-area communities. Scheduled and charter air-passenger service is vital to the region's local visitor industry and for access to the region's remote recreational assets. Finally, air transport is the means for shipping most goods and supplies to and from the region's remote communities.

The Iliamna and King Salmon airports are classified as regional airports. They are the hubs for air-passenger traffic, and for airfreight and mail enroute between Anchorage, Kenai, Homer, and Dillingham and the communities of the Iliamna Lake region and the rest of the L&PB communities.

The preeminence of air transportation throughout the L&PB is reflected in transportation employment data. In 2008, 98 percent (52 of 53 jobs) of wage employment in the L&PB's transportation sector was in air transportation (ADOL&WD, 2009).

Routes and Distances

The air mileages between Iliamna Airport and the main regional airports that serve it are as follows (Table 19-2):

- Anchorage: 195 miles.
- Dillingham: 136 miles.
- Homer: 120 miles.
- Kenai: 138 miles.

- King Salmon: 97 miles.

All the communities for which Iliamna Airport is the regional hub are within 50 air miles. King Salmon Airport is the regional air hub for communities in the western and southern part of the L&PB, including Igiugig. Air passengers bound from those communities to Iliamna are typically routed through King Salmon. Table 19-2 also shows air mileages between those communities and King Salmon. Dillingham is the regional hub for communities in the Dillingham census area.

Iliamna Airport

As a regional airport, Iliamna Airport is the primary transportation hub for the study-area communities. Iliamna Airport has served as the in-region logistical base for exploration activities at the Pebble Project area.

The state airport at Iliamna was built in the 1940s as a military airport. The State of Alaska assumed ownership in 1966. The airport is situated on a state-owned 1,245-acre tract. Figure 19-4 illustrates the location of the Iliamna Airport in relation to the community of Iliamna and the local road system. In all, there are four public runways at Iliamna (Figure 19-6). Iliamna Airport proper includes a primary north/south runway (150 by 4,800 feet) and a crosswind east/west runway (100 by 5,080 feet). Both runways were paved in 2003, making the airport suitable for small jet-aircraft landings. There are public floatplane waterlanes on East Wind Lake just north of the airport and on Pike Lake to the west. In addition, there is a private gravel landing strip near East Wind Lake and a private floatplane waterlane on Slop Bucket Lake east of the airport at the edge of Iliamna Lake. According to Federal Aviation Administration criteria, the current and projected level of air operations (estimated 15,300 annual operations in 2005, projected 22,293 annual operations in 2025 [HDR, 2007a]) at Iliamna Airport is not sufficient to justify an air-traffic control tower. A flight service station operates from May to October. The entire Iliamna Airport perimeter is fenced (HDR, 2007a).

The ground space available for leaseholders at Iliamna Airport is limited. Figure 19-7 shows land ownership status in the airport vicinity. Adjacent property owners include two Alaska Native village corporations (Iliamna Natives Limited [INL] and Alaska Peninsula Corporation) as surface owners and the Bristol Bay Native Corporation as owner of the subsurface underlying the village-corporation landholdings. All the lots surrounding East Wind Lake, which serves as a public floatplane landing, were originally conveyed as Native allotments (Figure 19-7), but some may no longer have the legal status of allotments after subsequent reconveyances and/or subdivision. ADOT&PF has 32 lease lots on its airport property. There are 18 lease lots on 15.4 acres along the east side of the primary runway and 14 lots on 5.3 acres with access to Pike Lake west of the primary runway. All but five vacant lots, totaling 2.3 acres, next to the primary runway were leased or leases had been applied for. All the lots on Pike Lake were leased or leases had been applied for (HDR, 2007a).

HDR Alaska, Inc. completed the Iliamna Airport Master Plan for the ADOT&PF in 2007 (HDR, 2007a). In January 2009, the Federal Aviation Administration approved the new *Iliamna, Alaska Airport Layout Plan* (ADOT&PF, 2008). The master plan's operational analysis identified several important concerns. These included the potential for increased airspace conflicts resulting from increased use of the recently paved runways by small jet aircraft, impaired runway visibility caused by an on-airport hotel building and by high ground and trees within runway lines-of-sight, and the potential for incompatible land uses from

continuing development in the airport vicinity. The master plan presents recommended measures to address these concerns, but does not propose any major runway improvements or additions.

Other Study-area Community Airports

All the other study-area communities have state-maintained airports, except Port Alsworth, which has two private unpaved landing strips. Table 19-3 shows the length and type of surface for the runways in each study-area community. The ADOT&PF has airport layout plans for Igiugig, Kokhanok, Levelock, Nondalton, and Pedro Bay (ADOT&PF, various). Because Port Alsworth does not have a state airport, it does not have a state airport layout plan.

Remote Landing Sites

Most charter air traffic to remote sites in the study area is for wilderness recreation such as sportfishing, hunting, and wildlife viewing. Most popular remote destinations are situated near lakes or rivers. As a result, floatplanes are the most common means of access to remote destinations in the study area.

There are two remote (ground) landing strips of interest in the study area. One is near Summit Lake along the route of the Williamsport-Pile Bay Road. The other is near the South Fork of the Koktuli River due north of Sharp Mountain and approximately 7 miles southwest of the Pebble Deposit area. The latter strip provides access to the South Fork of the Koktuli River for rafters and other river users.

Numerous other remote landing strips are in the regional study area but not in the immediate vicinity of the Pebble Deposit or possible transportation corridor. Locations of remote landing strips include the following:

- Keyes Point peninsula on Lake Clark.
- At the head of Chulitna Bay on Lake Clark west of Port Alsworth.
- About 10 miles east of the confluence of the Mulchatna and Stuyahok rivers.
- Kulik Lodge in Katmai National Park.
- Four abandoned village sites (Koggiung, Kvichak, Nakeen, and Libbyville) near the head of Kvichak Bay.
- Big Mountain, a restricted military airfield about 30 miles south of Iliamna.

Passenger Carriers, Scheduled Service, and Fares

Iliamna Air Taxi offers year-round scheduled passenger service between Iliamna and Anchorage and between Iliamna and most of the other study-area communities. PenAir offers year-round scheduled service between King Salmon and western and southern L&PB communities. Both PenAir and Alaska Airlines offer service between Anchorage, Dillingham, and King Salmon. There is no scheduled air service between Iliamna and Igiugig, which is serviced through King Salmon. There is no scheduled service between Iliamna and Dillingham or King Salmon.

Numerous charter flight services based at Iliamna, Port Alsworth, King Salmon, Homer, and elsewhere offer charter service throughout the Alaska Peninsula and Bristol Bay. These flight services and other

flight services affiliated with the numerous recreational lodges in the region cater to resident travelers and sportfishers, hunters, flight-seers, and other recreational visitors to the region.

Table 19-4 shows the prevailing roundtrip passenger fares as of April 2010 for selected trips between Iliamna and other destinations of interest. The airfares shown are subject to change because of changing fuel costs and other factors, but they illustrate the general fare structure for passenger service.

Passenger Traffic

Table 19-5 shows the annual volume of scheduled air-passenger arrivals to the study-area communities for 2002 through 2008. The data show a relatively stable level of annual passenger arrivals, ranging from about 9,900 to 11,300 yearly. These passenger arrival data partly reflect the frequency with which study-area community residents travel (there were only 918 residents in 2008), and partly the number of recreational travelers that visit the area. These data do not include unscheduled or charter-flight passengers.

Iliamna Airport was by far the busiest airport. From 2002 through 2008, Iliamna Airport accounted for approximately two-thirds of total scheduled passenger arrivals at destinations in the study area.

From 2006 through 2008, Iliamna Air Taxi carried approximately 98 percent of the scheduled passenger arrivals at Iliamna (Table 19-6). Era Aviation carried a substantial share of traffic until it sold its operations to PenAir in 2003. PenAir subsequently ceased scheduled service to Iliamna. As of 2008, Iliamna Air Taxi was Iliamna's only scheduled passenger airline.

Airfreight and Fuel Carriers

The study-area communities lack interregional road access. Barge transportation to the Iliamna Lake communities is seasonal, infrequent, and requires advance planning. As a result, a versatile air-cargo industry has developed to deliver most imported supplies, including foodstuffs and other consumer goods, building materials, general cargo, and in some cases, bulk petroleum fuels.

Everts Air Cargo and Northern Air Cargo provide scheduled airfreight and mail service year round from Anchorage to Iliamna. Typically, local carrier's then forward airfreight bound for other study-area communities. Iliamna Air Taxi forwards mail bound for Kokhanok, Nondalton, Pedro Bay, and Port Alsworth. Airfreight and mail bound for Igiugig, however, are routed through King Salmon. Depending on local runway conditions and load sizes, Everts Air Cargo, Northern Air Cargo, and Air Supply Alaska may deliver airfreight by charter directly to the study-area communities.

Everts Air Fuel and Air Supply Alaska are Kenai-based fuels suppliers. These firms have the capacity to deliver fuel by air tanker from Kenai to the study-area communities. Port Alsworth is not accessible by barge, so air delivery is its only means of fuel supply. Other study-area communities may be accessible by barge, but the seasonal window for barge delivery via the Kvichak River is limited, and low water on the Kvichak River sometimes precludes barge traffic. Moreover, fuel inventories are sometimes depleted before seasonal barge operations can begin in spring. In those cases, air delivery is the only feasible means to supply the fuel needs of these remote communities. Information on the volume of fuel delivered by air is not publicly available.

Airfreight and Bypass Mail

In the absence of year-round interregional land or water access from the state's major distribution centers, air-cargo service is vital to the study-area communities. For most of the year, air cargo is the only means of transporting goods. For practical purposes, all supplies, except items too bulky or prohibitively costly to ship by air, are delivered as air cargo.

Under the U.S. Postal Service's bypass mail program, shippers can mail cargo packages—up to 1,000 pounds—to rural Alaska destinations at third- or fourth-class mail rates. Bypass mail is an only-in-Alaska program. Shippers deliver their shipments directly to the air carriers who accept and deliver shipments, bypassing the postal service's mail-handling system. Shipments may consist of groceries, appliances, building materials, palletized goods, or other eligible general cargo within the weight and size limits. All mail to the study-area communities is transported by air carriers. In effect, the bypass mail program provides air-cargo service at about one-third the price of a commercial carrier.

Table 19-7 shows the air-cargo tonnage delivered to the study-area communities between 2002 and 2008. The cargo volumes reflect the importance of the air-cargo industry to these remote communities. In 2008, approximately 2,254 tons of freight and 767 tons of mail were deplaned at the study-area communities. As with air-passenger traffic, the scale of these figures is best gauged in comparison to local community populations. In 2008, the study-area communities as a group received 3.3 tons of air cargo per capita annually, or approximately 18 pounds per person per day.

The annual volume of air cargo tends to vary, particularly with the demands of local construction projects. Overall, airfreight tonnage more than quadrupled between 2002 and 2008, owing mainly to a large increase in tonnage to Iliamna. Airmail volumes have been more stable from year to year. In 2008, 80 percent of all inbound air cargo was deplaned at Iliamna.

Iliamna Airport is the air-cargo distribution center for all the study-area communities except Igiugig. Table 19-8 shows the volume of airfreight and mail deplaned at Iliamna Airport by scheduled carriers between 2002 and 2008. In 2008, Everts Air Cargo and Lynden Air Cargo delivered the bulk of air freight to Iliamna, while Arctic Circle Air, Everts Air Cargo, and Northern Air Cargo delivered most mail.

19.6.2 Transportation Plans and Proposed Transportation Improvements

The discussion below reviews several existing or ongoing plans and proposed projects for transportation improvements in the study area.

19.6.2.1 Southwest Alaska Transportation Plan

The *Revised Southwest Alaska Transportation Plan* (referred to herein as the 2004 SWATP; PB Consult Inc., 2004) is a long-term multi-modal transportation plan for an extensive region that includes the Lake and Peninsula, Bristol Bay, Kodiak Island, and Aleutians East boroughs, plus the Dillingham Census Area, the Pribilof Islands, and the rest of the Aleutian Islands (Figure 19-8). (The original SWATP [referred to herein as the 2002 SWATP; Parsons Brinckerhoff, 2002] was superseded in 2004 by the revised SWATP to resolve litigation concerning the Iliamna-Nondalton Road and Bridge project [see discussion in Section 19.6.2.2]).

This chapter focuses on elements of the SWATP that concern the Alaska Peninsula and Bristol Bay regions. The SWATP identifies three overland transportation corridors for potential development in the Alaska Peninsula and Bristol Bay regions. (The *Bristol Bay Area Plan* [ADNR, 2005], which is the state plan for management of state lands in the central L&PB and Bristol Bay regions, incorporates these three transportation corridors.):

- Cook Inlet to Bristol Bay Corridor.
- Dillingham/Bristol Bay Area Corridor.
- Alaska Peninsula Corridor.

Cook Inlet to Bristol Bay Corridor

This corridor anticipates improvements to the existing Williamsport-Pile Bay Road and its eventual extension, in stages, to Iliamna, to Igiugig, and to Naknek, with a spur road to Nondalton and a road and bridge to connect Naknek and South Naknek (Figure 19-9). Envisioned benefits include more economical movement of freight, better access to the region's visitor attractions and between the newly-connected communities, and enhanced opportunities for regional economic development. The proposed road segments are illustrated in Figure 19-9 and are listed in order of recommended priority with their estimated capital costs in Table 19-9.

The top-priority Williamsport-Pile Bay Road and associated navigation and dock improvements are partly in the Cook Inlet drainages study area and partly in the Bristol Bay drainages study area. The Williamsport-Pile Bay project can be implemented as a standalone segment of the development in the Cook Inlet to Bristol Bay corridor. (Improvements made to the Williamsport-Pile Bay Road in 2009 are described in Chapter 47).

The SWATP's next two priorities are the Iliamna-Nondalton and the Naknek-South Naknek improvements. The SWATP predicts that the Iliamna to Nondalton (estimated cost: \$12,520,000) and Naknek to South Naknek (estimated cost: \$30,602,000) road segments might be constructed within the next 20 years, regardless of the Pebble Project. These projects provide local road links between nearby communities and are less costly than the intra-regional projects discussed below.

The remaining road segments—Pile Bay to Iliamna (estimated cost: \$51,870,000), Iliamna to Igiugig (estimated cost: \$87,880,000), and Igiugig to Naknek (estimated cost: \$127,675,000)—are increasingly costly. The SWATP considers construction of any of these road projects as unlikely within the next 20 years in the absence of major new resource development or other changed circumstances.

Other proposed improvements related to the Williamsport-Pile Bay Road include navigation improvements and dock construction at Williamsport and construction of a public dock and boat launch at Pile Bay (see Chapter 47).

Construction of the Williamsport-Iliamna Road segment would make feasible fuel delivery by barge to Williamsport and onward by overland truck to the newly road-accessible communities (Iliamna, Newhalen, Nondalton, Pedro Bay). The SWATP economic analysis estimates a possible reduction in fuel transportation costs to those four communities of 75 to 85 percent (Table 19-10). For dry cargo, the economic analysis estimates a reduction in transportation costs of approximately 50 percent resulting

partly from lower shipping rates and partly from a modal shift from airfreight to barge/road delivery via the Williamsport-Iliamna Road (Table 19-11). Lesser savings are projected for transport of fishing vessels between Cook Inlet and Bristol Bay.

According to the SWATP, rehabilitation of the Williamsport-Pile Bay Road segment, with port improvements at Williamsport and Pile Bay, is projected to produce slightly lower cost savings for transportation of dry cargo to the Iliamna Lake communities, similar savings for fishing-vessel transport, but no practical alternative to the current conditions for delivery of petroleum fuels. (Those findings, which presumed operation of the Kvichak River barge route, now appear outdated.) The cost-effectiveness analysis (Table 19-12) estimated that the Williamsport-Pile Bay road and port improvements would result in annual net savings of about \$1.0 million.

Dillingham/Bristol Bay Area Corridor

The SWATP identified this corridor for eventual development of a road from Dillingham via Aleknagik to Levelock and on to Igiugig, where it would link with the Cook Inlet to Bristol Bay and Alaska Peninsula corridors (Figures 19-8 and 19-9). Improvements to the existing Dillingham-Aleknagik Road are proposed for the near term. Construction of new road segments beyond Aleknagik (estimated cost: Aleknagik-Levelock segment—\$167,240,000; Levelock to Igiugig-Naknek Road segment—\$43,635,000 [PB Consult Inc., 2004]) presupposes completion of the Cook Inlet to Bristol Bay roadway, which is not expected to occur within the next 20 years. Thus, a road linking the two corridors represents a concept for the distant future. The cost-effectiveness analysis of the individual road segments indicates that none of the segments, except the Williamsport-Pile Bay segment, would yield net savings under prevailing economic conditions.

Alaska Peninsula Corridor

This SWATP-recommended overland corridor envisions eventual development of a road system between Naknek and Ivanof Bay that would link several communities on the Alaska Peninsula: Egegik, Pilot Point, Ugashik, Port Heiden, Chignik Lake/Chignik Lagoon/Chignik Bay, Perryville, and Ivanoff Bay (Figure 19-8). This road would permit distribution of fuel and cargo through the port at Chignik to other Alaska Peninsula communities. The only segment considered likely for construction within the next 20 years is the inter-village road to link the three Chignik communities.

Other Transportation Methods

The SWATP does not identify any potential water-transportation projects in the Bristol Bay drainages study region. It does acknowledge a need for local dock and port improvements at Iliamna Lake communities, but it does not propose specific projects.

The SWATP also identifies several airport runway-extension projects needed by study-area communities, with the following estimated costs: Kokhanok—\$3,800,000; Pedro Bay—\$2,500,000; Port Alsworth—no estimate; and Igiugig—\$1,000,000. As discussed below in Section 19.6.2.4, ADOT&PF's rural airports improvement plan proposes funding for the projects at Kokhanok and Igiugig sometime after fiscal year 2012.

19.6.2.2 Iliamna-Nondalton Road and Bridge Project

The State of Alaska has pursued construction of the Iliamna-Nondalton road and bridge project for many years. The project consists of improvements to existing roads from each community to the Newhalen River and construction of a bridge across the Newhalen River (Figure 19-5). Iliamna and Nondalton are approximately 16.7 road miles apart. The project would enable safe overland travel year round between Iliamna/Newhalen and Nondalton. Nondalton is the most populous settlement in the L&PB, and Iliamna is its aviation hub. At present, people and goods move between Iliamna/Newhalen and Nondalton by various means according to the season, including by air, by boat, and when river-ice conditions permit, by snow machine and motor vehicle.

ADOT&PF prepared an environmental assessment for the Iliamna-Nondalton road and bridge project (ADOT&PF, 2000) for the Federal Highway Administration (FHWA). The 2002 SWATP affirmed support for the project. According to the 2002 SWATP, completion of the project would improve public safety, would reduce transportation costs for Nondalton residents, would give Nondalton residents access to expanded employment opportunities, and would remedy erosion problems and other environmental deficiencies in the existing road.

The 2002 SWATP scheduled the project for construction in fiscal years 2004 through 2006; however, two litigants (Alaska Council of Trout Unlimited and a Lake Clark property owner) appealed the project in state and federal courts. In January 2004, the Alaska Superior Court issued a preliminary injunction to halt project construction pending completion of further economic analysis. The additional economic analysis was completed as part of the 2004 SWATP, and the Alaska Superior Court rescinded the preliminary injunction in January 2005. The federal court also dismissed the original federal case. The same litigants filed a second federal case in May 2005 contesting the validity of the environmental assessment. At FHWA's direction, ADOT&PF was required to prepare a supplementary environmental evaluation for review by FHWA. As of May 2010, ADOT&PF was preparing that evaluation. The state's fiscal year 2010 budget appropriated \$1.0 million to ADOT&PF to complete final project design. The 2010-2013 Statewide Transportation Improvement Plan (ADOT&PF, 2009b) proposed appropriation of \$20.0 million in the state's fiscal year 2011 budget, but the legislature did not make that appropriation. Subject to funding, ADOT&PF expects to begin construction after FHWA approval.

19.6.2.3 ADOT&PF Industrial Roads Program—Pebble Mine Access

Iliamna Regional Transportation Corridor Analysis

ADOT&PF's Industrial Roads Program (ADOT&PF, 2005) aims to provide access to remote locations with resource development potential. The Iliamna Regional Transportation Corridor Analysis (PND et al., 2007), prepared under the Industrial Roads Program, examined alternatives for a deep-water port and an overland transportation route to support development of the possible Pebble Project. These improvements would provide a corridor for inbound freight and fuel and for export of metal concentrates. It also would provide improved year-round overland access between west Cook Inlet and four study-area communities (Pedro Bay, Iliamna, Newhalen, and Nondalton). The analysis identified eight possible road alignment options between the Pebble Deposit area and a new tidewater port on Cook Inlet (Figure 19-10, note that alignment options are identified in the figure legend). Based on engineering, cost, and environmental factors, the study selected a preferred port site and road alignment (Port Site 1 and Alignment Option A on Figure 19-10). The preferred road route is 94.1 miles in length. From the preferred port site, the route

follows the coastal perimeter from lower Iniskin Bay to the head of Iliamna Bay, and then crosses Iliamna Bay to Williamsport, where it connects to the existing Williamsport-Pile Bay Road. Beyond Pile Bay, the preferred route runs north of the Iliamna Lake shoreline, passing close to Pedro Bay. It generally follows the Cook Inlet to Bristol Bay Corridor identified in the SWATP.

19.6.2.4 Proposed Airport Improvements and Plans

ADOT&PF's rural airport improvement spending plan (ADOT&PF, 2009c) proposes funding, sometime after fiscal year 2012, for airfield projects in three study-area communities:

- Igiugig runway extension and resurfacing (\$3.7 million).
- Iliamna airport improvements (\$28.6 million) and airport hotel demolition/removal (\$1.25 million).
- Kokhanok runway extension (\$3.8 million).

ADOT&PF has an airport master plan underway for Port Alsworth Airport. ADOT&PF initiated a master plan for Port Alsworth Airport in September 2004. At present, Port Alsworth has two private landing strips, but no public airport. Port Alsworth is the field headquarters for and gateway to Lake Clark National Park and Preserve. It is also the location of or point of access to numerous recreational lodges. The *Port Alsworth Draft Airport Master Plan* (HDR, 2007b) assessed existing conditions and needs, identified several alternative airport sites, and recommended a site southwest of the main settlement area as the preferred alternative for construction of a new public airport with a current estimated construction cost of \$20.3 million. ADOT&PF expects the final airport master plan will be completed in late 2010.

19.6.2.5 Lake and Peninsula Borough Transportation Improvement Plans

The L&PB's 2009-2010 list of capital improvement projects identifies its borough-wide project priorities and village-identified priorities for each borough community (L&PB, n.d.). The only borough-wide transportation project priority in the study area is completion of the Williamsport-Pile Bay Road improvements, including port facilities. The village priorities for transportation improvements in each community are:

- Igiugig runway extension.
- Iliamna dock.
- Kokhanok small boat harbor/dock/boat ramp.
- Newhalen road construction.
- Nondalton local roads improvement and airport runway extension.
- Pedro Bay new landfill access road and bridge project, public dock/waterfront construction at Smokehouse Bay, road maintenance facility, and Pedro Bay airport extension.
- Port Alsworth public access airport and motor grader for road maintenance.

In 2008, PND Engineers, Inc. completed preliminary designs and cost estimates for the L&PB for barge landing facilities at Igiugig, Iliamna, Kokhanok, Pedro Bay, and Pile Bay (PND, 2008). The design project was funded by the Denali Commission.

19.7 Summary

This chapter describes existing and planned inter- and intra-regional overland, water, and air transportation facilities and services for eight L&PB communities (Igiugig, Iliamna, Kokhanok, Levelock, Newhalen, Nondalton, Pedro Bay, and Port Alsworth) nearest to possible Pebble Project facilities.

The study-area communities are small and remote, with no interregional overland transportation facilities. There are no transportation facilities to or at the Pebble Deposit area. The Williamsport-Pile Bay Road traverses the narrow isthmus-like neck of land between the Williamsport barge landing and Pile Bay on eastern Iliamna Lake, providing a shortcut between Cook Inlet and the Iliamna Lake communities and Bristol Bay beyond. However, the road is narrow and in poor condition and is open for use between June and November only. It is mainly used to transship commercial fishing vessels and small freight between Cook Inlet and Bristol Bay. The Iliamna/Newhalen area has the most extensive local road system and the highest rate of vehicle ownership and use. Elsewhere, local roads and vehicle traffic are very limited.

The study-area communities, except Nondalton and Port Alsworth, are accessible by water via the Kvichak River or the Williamsport-Pile Bay Road. Most waterborne cargo is transshipped from Naknek via the Kvichak River. Waterborne cargo consists mainly of bulk fuels and other freight too bulky or heavy to ship by air. Local dock and cargo-handling facilities are limited and typically in poor repair. The shipping season is limited to a 2- to 3-month period in late summer.

With minimal overland- and marine-transportation infrastructure, the study-area communities rely heavily on air transportation for movement of people and goods to, from, and within the region. All the study-area communities are accessible by air. Each community has a state airport, except Port Alsworth, which has two private landing strips but no public airport. Iliamna Airport is the regional air transportation hub to and through which most inter- and intra-regional air traffic travels.

Lacking other regular transportation services, air cargo carriers—both bypass mail and private airfreight—are vital for the regular supply of foodstuffs, consumer goods, building materials, and, in some cases, bulk fuels to study-area communities. At present, exploration activities at the Pebble Deposit area are supported by helicopter service based at Iliamna Airport.

Both air and waterborne transportation services are costly. This expense adds substantially to the local cost of living.

The SWATP identifies several regional surface corridors for future transportation improvements: a Cook Inlet to Bristol Bay Corridor, a Dillingham/Bristol Bay Area Corridor, and an Alaska Peninsula Corridor. It proposes, and funds are programmed for, two major transportation projects in the study area: improvements to the Williamsport-Pile Bay Road and completion of the stalled Iliamna-Nondalton road and bridge project. As part of its Industrial Roads Program, the state is also evaluating the feasibility of a new deepwater port in the Williamsport vicinity with a new road link to the Pebble Deposit area. This latter project generally follows the Cook Inlet to Bristol Bay Corridor identified in the SWATP.

Major airport improvements are in process or are programmed for Kokhanok and Igiugig. Ongoing airport master plans for Iliamna Airport and Port Alsworth may result in airport improvement projects for those localities.

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TABLES

TABLE 19-1
Average Daily Traffic Count and Average Daily Vehicle Miles for 2008, State Routes in Study Area

State Route	Road Length (miles)	Average Daily Traffic Count	Average Daily Vehicle Miles
Iliamna Village Road	3.805	N/A	755
Iliamna Village Spur Road	1.403	260	365
Newhalen Village Road	2.936	210	616
Iliamna-Nondalton Road ^a	7.221	160	1,155
Old Newhalen River Road	1.575	20	32
Nondalton City Streets	0.500	120	60
Williamsport-Pile Bay Road	15.030	10	150

Notes:

a. The total road length from Iliamna Village Road to the end of the existing Iliamna-Nondalton Road is actually 14.4 miles. Traffic count data are to mile 7.2 only.

N/A = not available (this route consists of several segments with numerous points of access/exit. It is not possible to calculate an average daily traffic count from the data).

Source: ADOT&PF, 2009a.

TABLE 19-2
Air Distances between Iliamna or King Salmon and Select Locations

From	Distance to Iliamna (miles)	From	Distance to King Salmon (miles)
Anchorage	195	The Chigniks	178
Kenai	138	Egegik	42
Homer	120	Igiugig	52
Dillingham	136	Levelock	31
King Salmon	97	Perryville	213
Igiugig	46	Pilot Point	84
Kokhanok	22	Port Heiden	140
Nondalton	16	Ugashik	95
Pedro Bay	27		
Port Alsworth	37		

Source: USDOT, 2010.

TABLE 19-3
Airplane Landing Facilities, Study-area Communities

Community	Runway Size (feet)	Runway Surface	Ownership
Igiugig	3,000 by 75	Gravel	State
Iliamna/Newhalen	5,080 by 100	Pavement	State
Iliamna/Newhalen	4,800 by 100	Pavement	State
Iliamna/Newhalen	3,000 by 400	Water	State
Iliamna/Newhalen	2,900 by 400	Water	State
Kokhanok	3,300 by 75	Gravel	State
Levelock	3,280 by 75	Gravel	State
Nondalton	2,800 by 75	Gravel	State
Pedro Bay	3,000 by 60	Gravel	State
Port Alsworth	3,000 by 100	Dirt/gravel	Private
Port Alsworth	4,200 long	Gravel	Private

Sources: PB Consult, Inc., 2004; Kemplen, pers. comm., 2008.

TABLE 19-4

Airfares and Airfreight Rates, Select Alaska Peninsula and Bristol Bay Communities, April 2010

Community	Roundtrip Airfare	Freight Rate per 100 Pounds
Between Iliamna and		
Anchorage	\$440	\$60
Homer	\$1,820 ^a	N/A
Igiugig	\$450	\$50
Kenai	\$650 ^a	N/A
King Salmon	\$1,260 ^a	N/A
Kokhanok	\$110	\$40
Nondalton	\$110	\$40
Pedro Bay	\$110	\$40
Port Alsworth	\$120	\$40
Between King Salmon and		
Chignik Bay	\$462	\$74
Chignik Lagoon	\$462	\$74
Chignik Lake	\$462	\$74
Egegik	\$220	\$33
Igiugig	\$220	\$37
Levelock	\$176	\$26
Perryville	\$550	\$86
Pilot Point	\$286	\$53
Port Heiden	\$364	\$59
Ugashik	\$286	\$53

Notes:

a. Rate for single-person charter.

N/A = Not applicable.

Sources: Personal communications with Iliamna Air Taxi and PenAir, 2010.

TABLE 19-5
Annual Scheduled Air-passenger Arrivals by Study-area Community, 2002 through 2008

Community	Number of Passengers						
	2002	2003	2004	2005	2006	2007	2008
Igiugig	1,100	832	806	908	682	703	518
Iliamna	7,021	6,896	6,177	7,093	6,655	6,910	7,665
Kokhanok	1,026	1,128	1,043	1,170	1,028	900	1,018
Levelock	278	768	697	647	535	672	520
Nondalton	624	688	707	723	721	567	508
Pedro Bay	1,097	365	374	414	297	302	260
Pt. Alsworth	126	128	70	163	95	62	74
TOTAL	11,272	10,805	9,874	11,118	10,013	10,116	10,563

Source: USDOT, 2010.

TABLE 19-6
Annual Scheduled Air-passenger Arrivals at Iliamna Airport, by Carrier, 2002 through 2008

Carrier	Number of Passengers						
	2002	2003	2004	2005	2006	2007	2008
Iliamna Air Taxi	5,202	4,940	4,629	6,147	6,454	6,780	7,551
PenAir	482	1,907	1,490	878	166	127	104
Other ^a	1,337	49	58	68	35	3	10
TOTAL	7,021	6,896	6,177	7,093	6,655	6,910	7,665

Notes:

- a. "Other" refers to several carriers that have discontinued service or deplaned fewer than 50 passengers: Arctic Circle Air Service, Era Aviation, Frontier Flying Service, Grant Aviation, Hageland Aviation Service, Servant Air, Smokey Bay Air, Inc., Tanana Air Service, Wright Air Service, and Yute Air.

Source: USDOT, 2010.

TABLE 19-7
Tons of Air Cargo Deplaned by Study-area Community, 2002 through 2008

Community	2002		2003		2004		2005		2006		2007		2008	
	Freight	Mail	Freight	Mail	Freight	Mail	Freight	Mail	Freight	Mail	Freight	Mail	Freight	Mail
Igiugig	55.0	43.4	79.0	43.5	12.5	36.4	15.7	33.5	30.4	29.5	13.0	27.0	36.3	34.1
Iliamna	279.6	380.7	683.6	644.9	884.2	583.8	994.2	545.8	1,310.7	487.9	2,076.5	509.3	1,944.4	485.2
Kokhanok	16.9	123.1	17.9	114.3	13.5	88.4	12.5	83.9	13.5	85.3	19.2	76.8	29.8	74.6
Levelock	3.0	14.4	14.5	40.4	17.1	48.8	14.6	29.6	23.1	35.9	34.9	44.9	18.4	44.9
Nondalton	16.3	139.2	13.9	139.2	8.4	95.8	9.3	70.2	123.7	51.9	66.6	57.9	14.1	61.2
Pedro Bay	6.7	39.4	6.8	39.0	6.2	36.7	6.3	36.1	4.1	29.0	8.9	26.9	11.5	24.1
Pt. Alsworth	108.0	69.7	38.3	79.4	79.0	55.0	278.7	61.5	144.7	51.1	349.4	55.1	199.7	42.9
TOTAL	485.5	808.9	853.9	1,100.6	1,021.0	944.9	1,331.3	860.6	1,650.2	770.7	2,568.6	798.0	2,254.1	767.1

Source: USDOT, 2010.

TABLE 19-8
Tons of Air Cargo Deplaned at Iliamna Airport, by Carrier, 2002 through 2008

Air Carrier	2002		2003		2004		2005		2006		2007		2008	
	Freight	Mail	Freight	Mail	Freight	Mail	Freight	Mail	Freight	Mail	Freight	Mail	Freight	Mail
Arctic Circle Air Service	0.0	68.7	0.2	71.2	9.5	75.7	12.8	75.0	36.1	88.0	12.6	256.7	3.3	133.5
Iliamna Air Taxi	2.5	9.6	2.5	21.2	23.9	16.4	42.8	19.5	101.4	21.9	134.9	17.9	136.7	19.4
Lynden Air Cargo Airlines	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	259.8	0.0	763.2	0.0	834.2	0.0
Northern Air Cargo, Inc.	84.5	64.4	511.4	300.4	591.7	237.4	371.1	178.8	11.7	0.0	84.1	19.1	416.8	120.3
Everts Air Cargo/Tatonduk Air	188.1	223.2	130.2	252.1	253.1	254.1	476.8	271.4	897.0	378.0	1,079.3	215.6	544.7	115.6
Other ^a	4.5	14.7	39.3	0.0	6.0	0.2	90.7	1.1	4.6	0.0	2.5	0.0	8.7	96.5
TOTAL	279.6	380.7	683.6	644.9	884.2	583.8	994.2	545.8	1,310.7	487.9	2,076.5	509.3	1,944.4	485.2

Notes:

a. "Other" refers to several carriers that provided limited or occasional service.

Source: USDOT, 2010.

TABLE 19-9

Estimated Cost of Recommended Road Improvements, Cook Inlet to Bristol Bay Corridor

Segment (listed in order of priority)	Estimated Capital Cost
Williamsport to Pile Bay	\$22,285,000
Iliamna to Nondalton	\$12,520,000
Naknek to South Naknek	\$30,602,000
Pile Bay to Pedro Bay to Iliamna	\$51,870,000
Iliamna to Igiugig	\$87,880,000
Igiugig to Naknek	\$127,675,000
TOTAL	\$332,832,000

Source: PB Consult Inc., 2004.

TABLE 19-10

Estimated Cost Savings for Petroleum Delivery with Improvements to Cook Inlet to Bristol Bay Corridor ^a

Community	2020 Costs With No Change	2020 Costs with Improvements	Possible Savings with Improvements	Percent Possible Savings with Improvements
Pedro Bay	\$39,300	\$5,900	\$33,400	85%
Iliamna/Newhalen	\$242,600	\$45,500	\$197,100	81%
Nondalton	\$216,400	\$43,300	\$173,100	80%
Igiugig	\$59,000	\$14,800	\$44,200	75%
Subtotal	\$557,300	\$109,500	\$447,800	80%
Other Communities ^b	\$1,402,500	\$1,284,600	\$117,900	8%
TOTAL	\$1,959,800	\$1,394,100	\$565,700	29%

Notes:

a. Based on 1999 shipping costs.

b. King Salmon, Naknek, South Naknek, Levelock, Aleknagik, and Dillingham.

Source: PB Consult Inc., 2004, Appendix C, Table C-5.

TABLE 19-11

Estimated Cost Savings for Cargo Other than Petroleum Deliveries with Improvements to Cook Inlet to Bristol Bay Corridor ^a

Community	2020 Costs With No Change	2020 Costs with Improvements	Possible Savings with Improvements	Percent Possible Savings with Improvements
Pedro Bay	\$324,500	\$160,700	\$163,800	50%
Iliamna/Newhalen	\$1,745,500	\$896,300	\$849,200	49%
Nondalton	\$1,992,200	\$799,400	\$1,192,800	60%
Igiugig	\$490,000	\$254,000	\$236,000	48%
Subtotal	\$4,552,200	\$2,110,400	\$2,441,800	54%
Other Communities ^b	\$22,215,800	\$14,488,700	\$7,727,100	35%
TOTAL	\$26,768,000	\$16,599,100	\$10,168,900	38%

Notes:

a. Based on 1999 shipping costs.

b. King Salmon, Naknek, South Naknek, Levelock, Aleknagik, and Dillingham.

Source: PB Consult Inc., 2004, Appendix C, Table C-11.

TABLE 19-12

Measures of Cost and Effectiveness for Proposed Roadway Segments, Cook Inlet to Bristol Bay Corridor

Segment	Annualized Capital and O&M Cost	Estimated Annual Cost Savings ^a	Net Annualized Cost
Williamsport to Pile Bay ^b	\$2,786,800	\$3,848,400	\$0
Pile Bay to Pedro Bay to Iliamna	\$5,409,200	\$2,247,800	\$3,161,400
Iliamna to Nondalton	\$1,407,260	\$115,800	\$1,291,460
Iliamna to Igiugig	\$9,051,300	\$1,974,700	\$7,074,600
Igiugig to Naknek	\$13,064,100	\$599,100	\$12,465,000
Naknek to South Naknek	\$2,950,120	\$83,900	\$2,866,220

Notes:

a. Based on 1999 freight costs.

b. Capital cost includes improvements to Williamsport-Pile Bay Road plus Williamsport navigation improvements and Pile Bay dock and boat-launch facility.

O&M = operations and maintenance.

Source: PB Consult Inc., 2004, Appendix C, Table C-2.

FIGURES

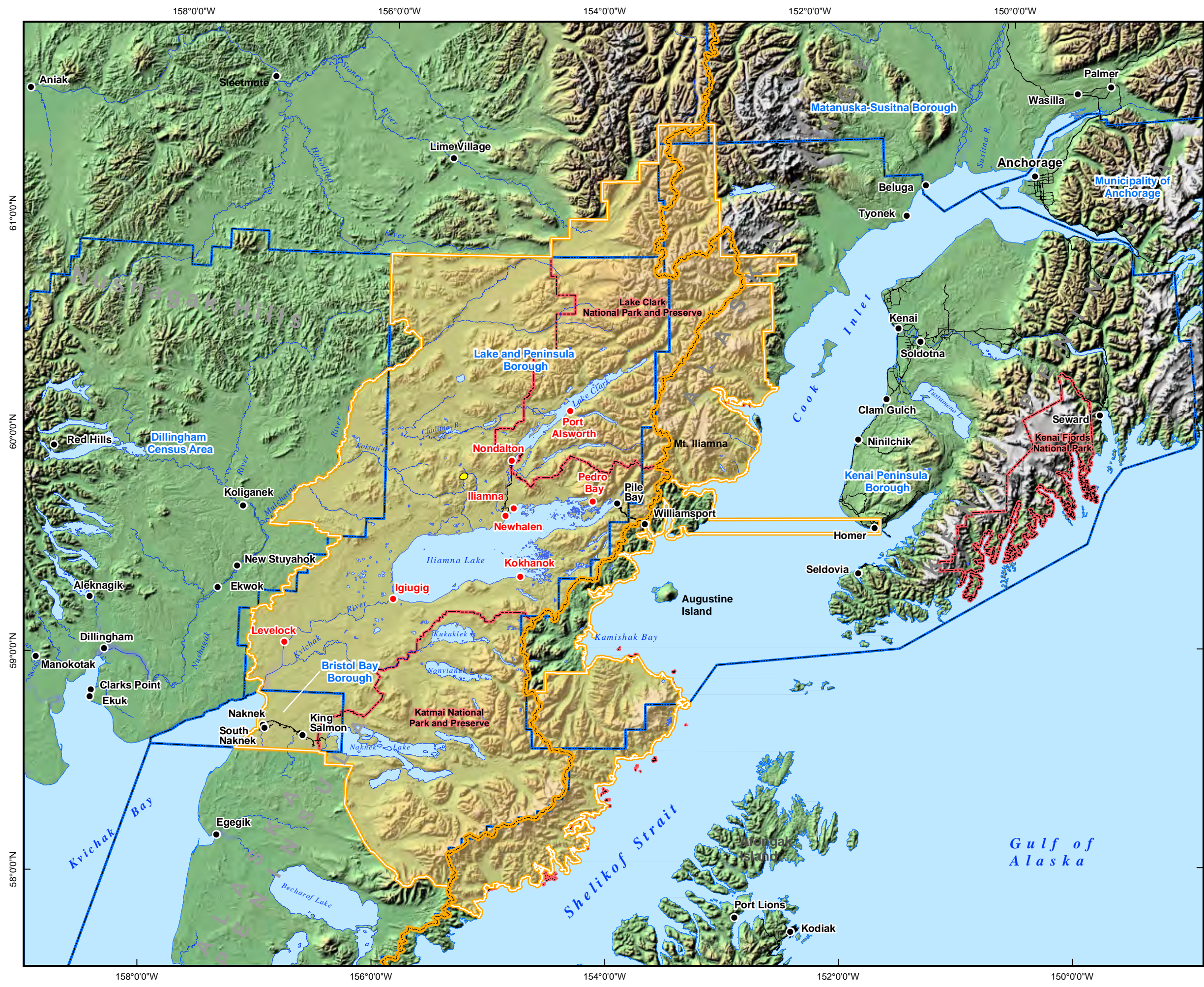
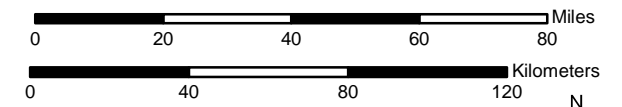
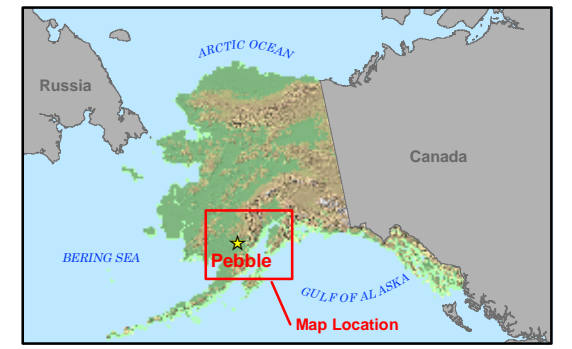


Figure 19-1
Transportation Study Areas
and Communities, Bristol Bay Drainages

Legend

- Study Area Communities
- Communities
- Bristol Bay Drainages Study Area
- Cook Inlet Drainages Study Area
- Bristol Bay/Cook Inlet Drainages Boundary
- General Deposit Location
- Political Boundary
- National Park and Preserve
- Existing Roads



Scale 1:1,900,000
Alaska State Plane Zone 5 (units feet)
1983 North American Datum

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Version: 6	Author: RDI-LS

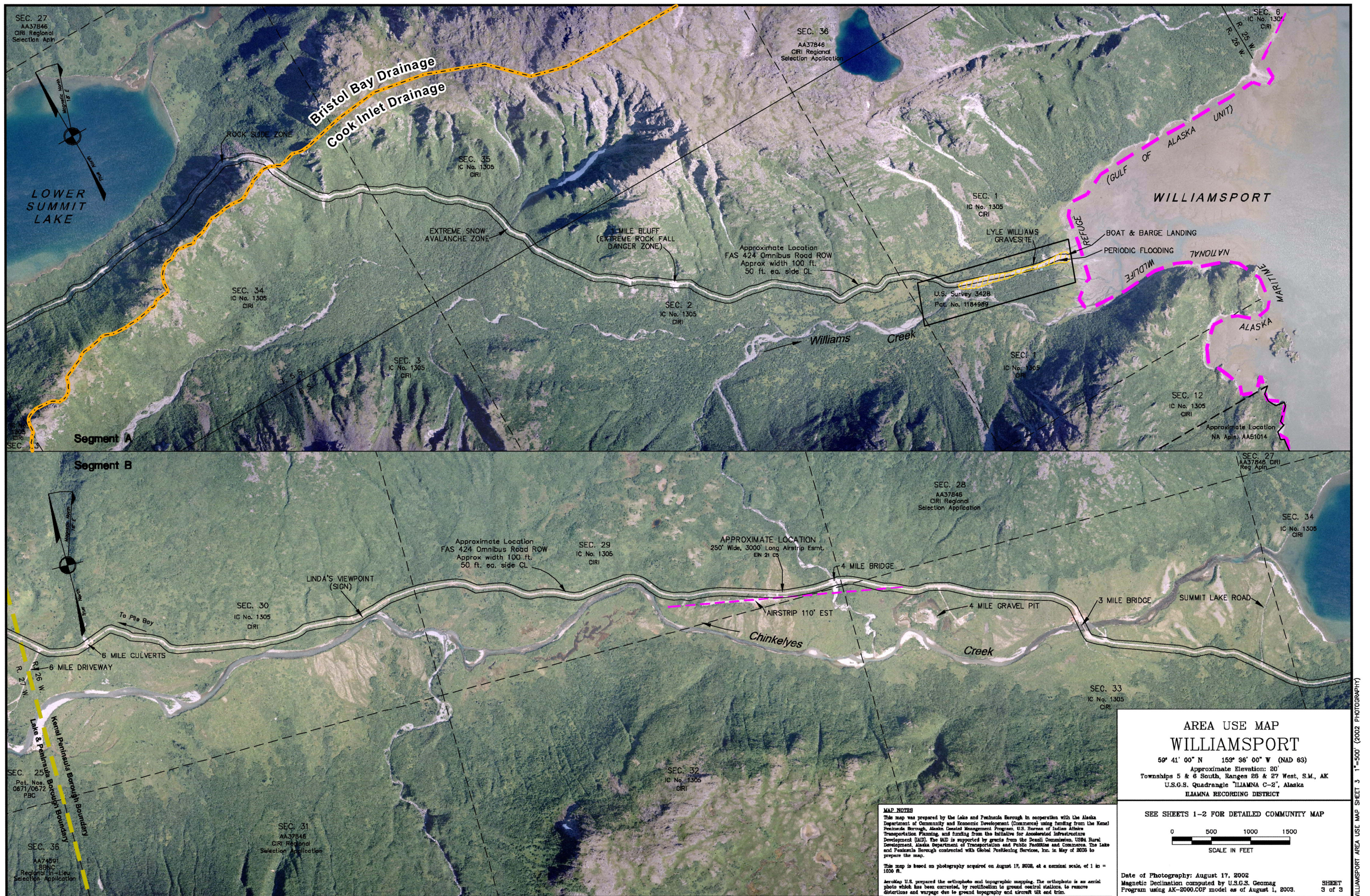


Figure 19-2A, Williamsport-Pile Bay Road Corridor, Williamsport End (L&PB and ADCED, 2005c, drainage divide label added).



Figure 19-2B, Williamsport-Pile Bay Road Corridor, Pile Bay End (LP&B and ADCED, 2005b).



Figure 19-4, Iliamna Airport Vicinity (LP&B and ADCCED, 2005a, labels added).

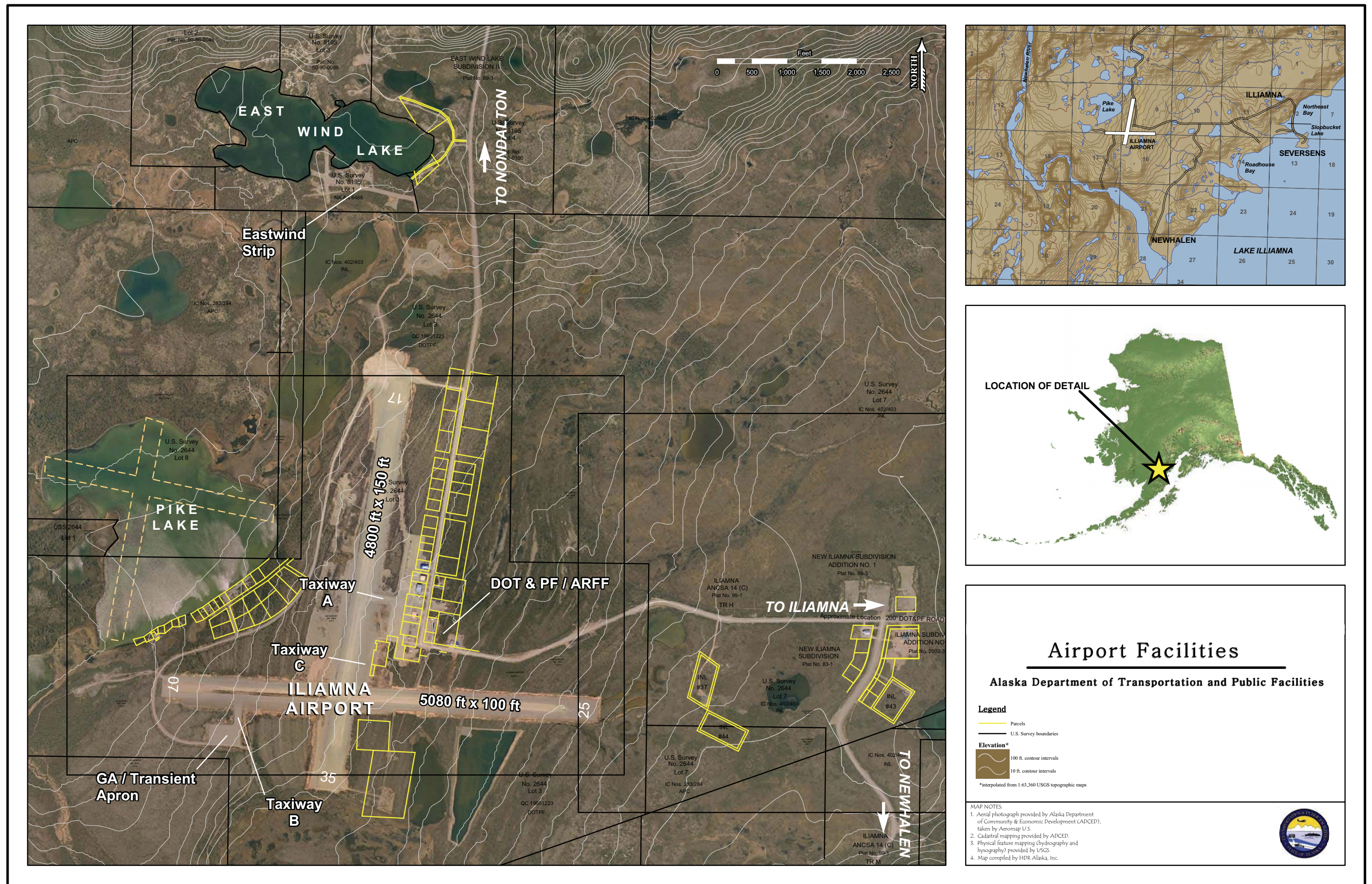


Figure 19-6, Iliamna Airport Facilities (HDR, 2004)

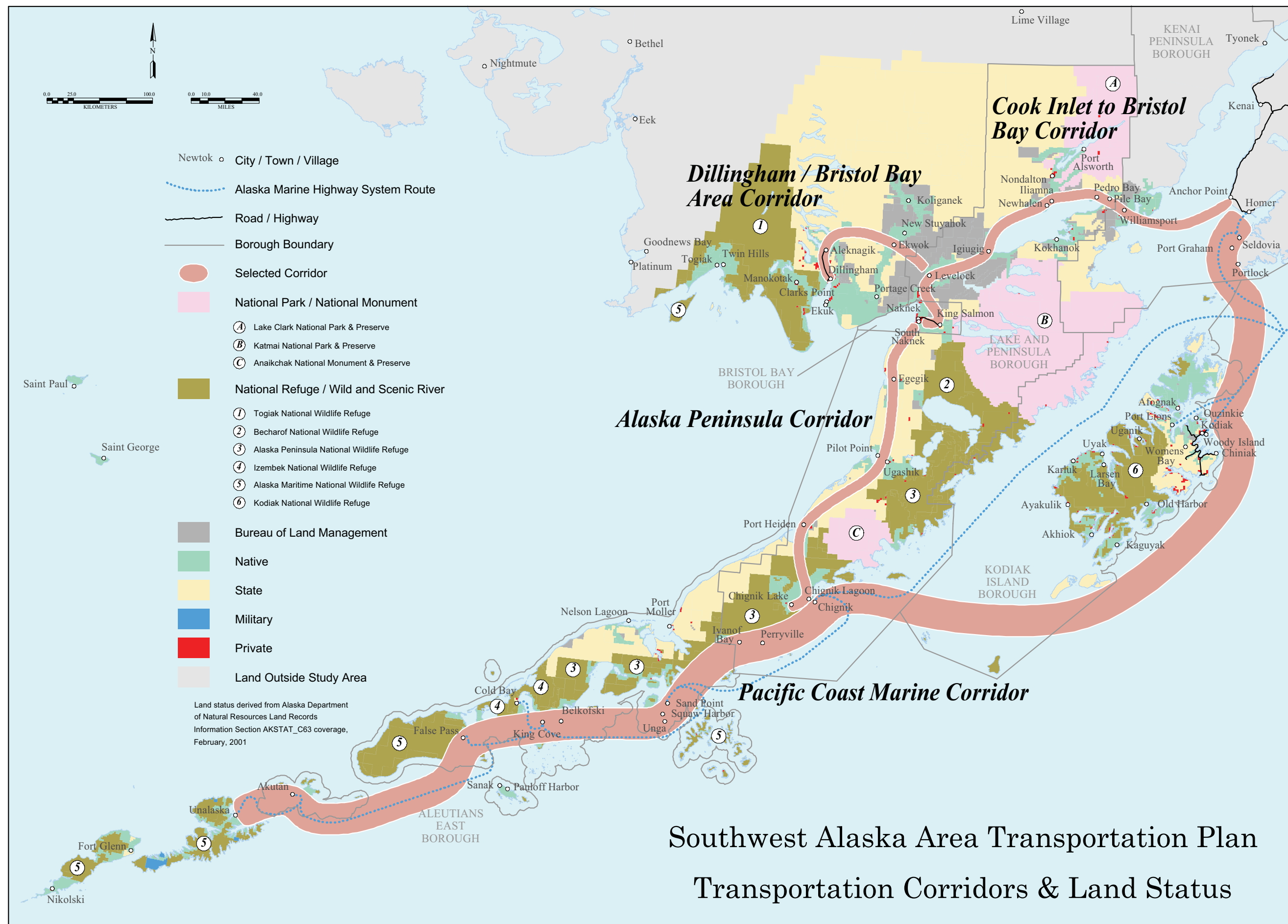


Figure 19-8, Transportation Corridors from Southwest Alaska Transportation Plan (PB Consult Inc., 2004).

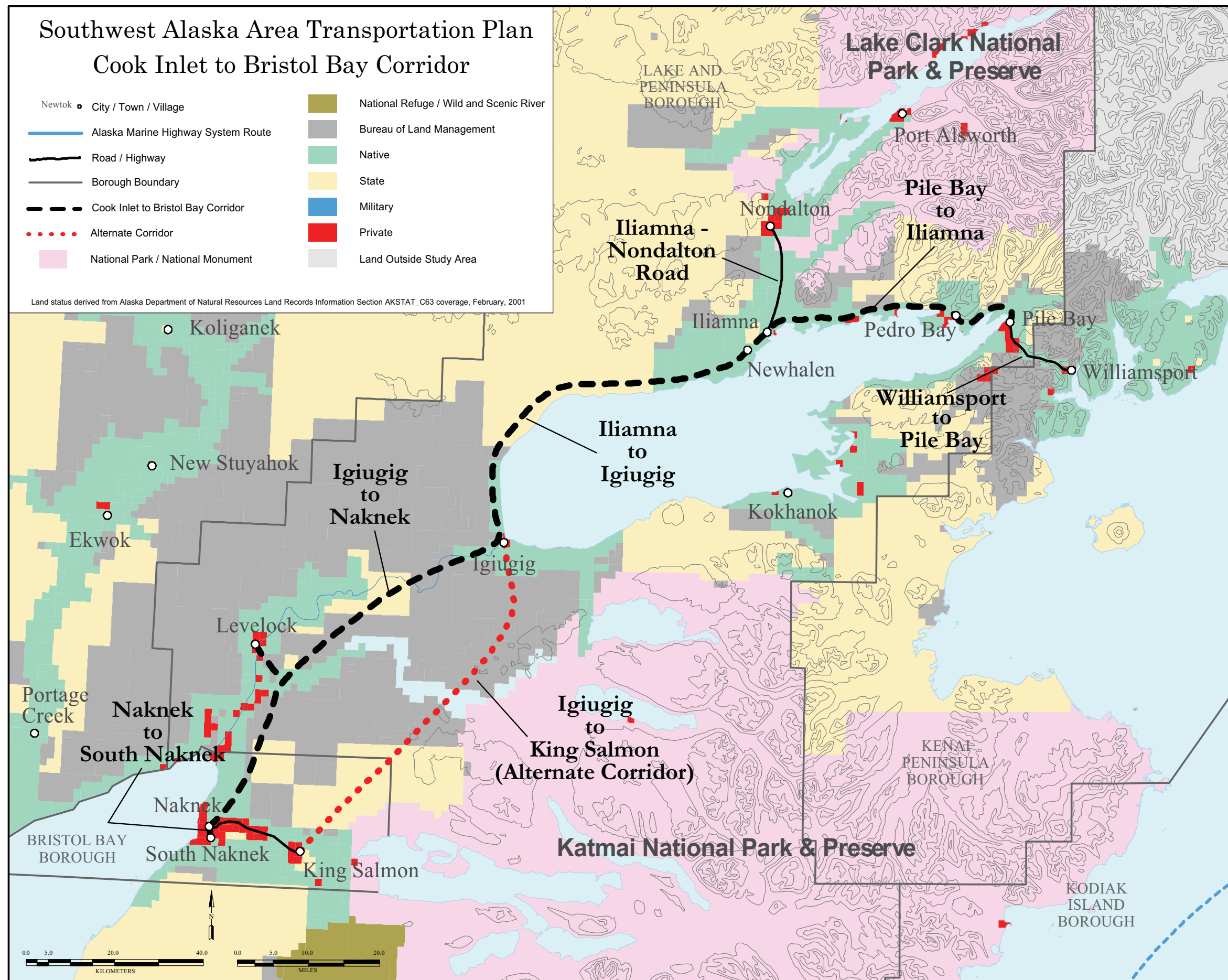


Figure 19-9, Cook Inlet to Bristol Bay Corridor, Southwest Alaska Transportation Plan (PB Consult Inc., 2004).



Figure 19-10, Alternative Port Sites and Road Corridors, Iliamna Regional Transportation Corridor Analysis (PND et al., 2007).