Northwest Alaska Transportation Plan

Community Transportation Analysis

An Element of the
Alaska Statewide Transportation Plan

Alaska Department of Transportation
and Public Facilities

February 11, 2004

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STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

February 20, 2004

My Fellow Alaskans:

Transportation systems open doors to the future. Improved transportation for Northwest Alaska will benefit economic development, and public education, and will improve health and safety, and recreational opportunities for the residents of this region of our state.

In an area where distance, climate, and geography combine to keep residents isolated, this Community Transportation Analysis of the Northwest Alaska Transportation Plan provides a comprehensive vision for future transportation systems. The plan was developed with involvement from local communities and from the private sector. It focuses on potential projects that create the most economic opportunities and the most advantageous connections.

Northwest Alaska holds the largest remaining reserves in the United States of coal, oil, natural gas, and several base metals. Providing access to these resources will provide the fuel for the economic engines of the region and Alaska.

The transportation vision for this region is not limited to road connections. Ports are key for many coastal and river communities, while airports connect communities to one another throughout this vast region.

Reliable and safe transportation is key to a better tomorrow. Improved transportation systems will help build a brighter future for this vast area of our state. I am pleased to convey to you this Community Transportation Analysis of the Northwest Alaska Transportation Plan.

Sincerely yours,

Frank H. Murkowski
Governor

Northwest Alaska
Transportation Plan

Community Transportation Analysis

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Clockwise from Top Left:
Region Map
Dalton Highway (DOT/PF)
Bypass Mail in Gambell (DOT/PF)
Barge on Yukon River (Yutana Barge Lines)
Koyukuk Post Office (DOT/PF)

Cover:
Far North (Alaska Division of Tourism)

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February 11, 2004

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

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February 11, 2004

Greetings:

I am pleased to present the Community Transportation Analysis (CTA) of the Northwest Alaska Transportation plan. This plan culminates a multi-year effort that began in 1999 to define and select a blueprint for the region's long-term transportation future.

The CTA reflects a broad-based effort to improve year-round mobility and access for residents in Northwest Alaska, and to broaden and diversify the region's transportation network. This effort explored potential road, aviation and marine transportation options and developed recommendations that would improve the movement of goods, improve interconnectivity between communities, and remove barriers to regional economic development.

The CTA was developed using an extensive public involvement process and incorporates a broadly-shared regional commitment to uphold and preserve traditional culture, lifestyle and natural resources while recognizing the necessary role of economic development in creating opportunities for education and employment and enhancing individual and community quality of life.

This CTA draws its authority from Alaska Statute 44.42.050 and is an element of the Statewide Transportation Plan as defined in 23 CFR 450.214. I am proud to hereby approve the Community Transportation Analysis of the Northwest Alaska Transportation Plan.

Sincerely,

Mike Barton

Mike Barton
Commissioner

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Chapter 1. Introduction

This document presents the Northwest Alaska Transportation Plan, which culminates a multi-year effort to define and select a blueprint for the region's long-term transportation future. The Alaska Department of Transportation and Public Facilities (DOT/PF), as the state agency responsible for highways, transit, ferries, airports, ports, and harbors, undertook this effort in 2001 to ensure that future investments in the region's transportation infrastructure are in the best overall public interest.

CH2MHill

Figure 1-1 Blanket Toss in Nuiqsut

This plan is one of several regional, multi-modal transportation plans that are part of the Statewide Transportation Plan required by state[1] and federal[2] law. The federal requirement is very important, as federal transportation funds must be allocated consistent with transportation plans prepared following federal guidelines.

The Northwest Alaska Transportation Plan reflects a broad-based effort to improve year-round mobility and access for residents, and to broaden and diversify the region's transportation network. This effort necessarily explored potential road, rail, aviation, and marine transportation options to lower the costs of moving goods and to remove barriers to regional economic development.

Due to the remote and largely undeveloped character of the region, conventional methods for determining the value of system improvements used in typical urban and rural settings were not helpful. Rather, the planning team employed a two-pronged approach, one aimed at an analysis of regional resource transportation needs and the other aimed at improving interconnectivity between communities within the region. Early discussions with regional leaders confirmed the planning team's concern that the significant resource development issues in northern Alaska called for separate plans for the two major components.

1. Alaska Statute 44.42.050
2. 23 Code of Federal Regulations (CFR) 450.214

The first we refer to as the Resource Transportation Analysis (RTA); the second we call the Community Transportation Analysis (CTA). This plan reflects the findings and conclusions of the CTA.

Community Transportation Analysis (CTA)

The CTA examines community-based transport needs. It focuses on aviation, winter trails, and barge operation networks. It also includes road proposals to connect communities, improve road safety, and/or provide local economic development opportunities.

This document is the CTA.

Resource Transportation Analysis (RTA)

The RTA focuses on resource development transportation needs. The RTA examines access to mineral and energy resources and the transport of those resources to world markets. Where applicable, the RTA identifies community access opportunities associated with potential resource transportation infrastructure.

This approach better focuses on each element's specific needs. It has also allowed DOT/PF to focus more clearly on the most pressing public involvement needs as they changed over the course of the plan development.

During 2001 and early 2002, the planning team developed CTA and RTA Phase I documents, which narrowed down the range of systems and projects to examine in Phase II.

The CTA Phase I document was updated and refined into a Draft Northwest Alaska Transportation Plan which underwent a 45-day period of public review prior to this finalization.

The RTA Phase I Report describes the region's mineral and energy resources, the transportation systems currently in operation and traditional and newly identified transportation corridors that could be used in the future to access and transport resources. DOT/PF used the results of the RTA Phase I to select corridors that warrant further review and development in RTA Phase II. The RTA Phase I Report will be available as an appendix of the RTA Phase II document.

The RTA Phase II Report is a series of planning level reconnaissance engineering efforts that develop alignments and cost estimates for selected routes. RTA Phase II also outlines funding opportunities and discusses policy issues that need attention to make infrastructure projects practical for industry to use and the state to maintain. The draft RTA Phase II Report is expected to be available in late 2004.

Alaska DOT/PF

Figure 1-2 Planning Meeting

The success of these efforts was only possible through the active partnership of the North Slope Borough, Northwest Arctic Borough, City of Nome, tribal governments, and representatives of numerous Native village and regional corporations, the mining industry, and the oil industry.

The plan incorporates a broadly-shared regional commitment to uphold and preserve traditional culture, lifestyle and natural resources while recognizing the necessary role of economic development in creating opportunities for education and employment, and enhancing and enriching individual and community quality of life. As such we think it is much more than a department plan; it is truly a representative transportation plan, reflecting in its recommendations the best interests of the region and the state.

This plan successfully meets the original goals established early in the planning effort to define transportation network improvements needed to promote economic development and to meet current and projected public demand for transportation services. But in undertaking this plan, we were challenged to think long-term while considering limited financial resources for capital investment in the near term. Confronting this challenge enabled us to view new infrastructure not so much in terms of benefits vs. costs (encouraging a short-term perspective), but rather in terms of *investment for sustained development*. So we concede that some infrastructure improvements recommended in these pages might not "pay for themselves" using methods typically employed to assess costs and benefits over a 20-year period. Other recommendations will be for new programs to address specific regional transportation needs (such as administration of an intercommunity trail network and a program for improving community barge landing sites).

The study area for the plan (Map 1-1) encompasses the North Slope Borough, the Northwest Arctic Borough, and includes an unincorporated area in northwest Alaska that is bordered by the Dalton Highway on the east and the Bering Sea on the west. The plan discusses transportation networks within the context of the plan's four subregions. This is done because local transportation systems, including aviation and fuel distributions, are based in regional hubs, where many health, education, and commercial activities are centered. The area subregions and the hub community in each is shown in Table 1-1.

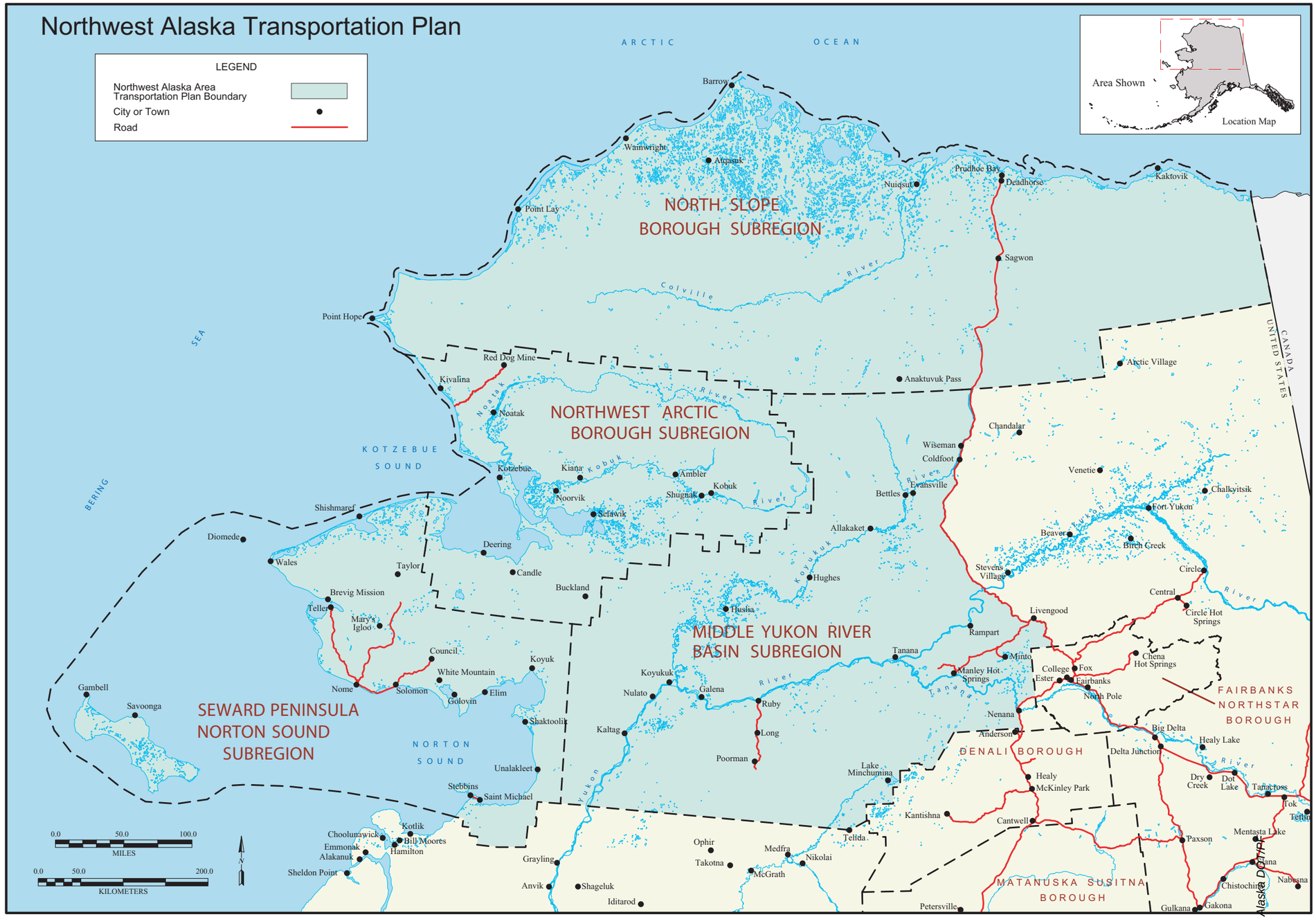
Table 1-1 Communities in the Northwest Alaska Study Area by Subregion (2000 Population[a])

Northwest Arctic Borough (hub: Kotzebue)		
Ambler (309)	Kivalina (377)	Noorvik (634)
Buckland (406)	Kobuk (109)	Selawik (772)
Deering (136)	Kotzebue (3,082)	Shungnak (256)
Kiana (388)	Noatak (428)	
North Slope Borough (hub: Barrow)		
Anaktuvuk Pass (282)	Kaktovik (293)	Point Lay (247)
Atqasuk (228)	Nuiqsut (433)	Wainwright (546)
Barrow (4,581)	Point Hope (757)	
Middle Yukon River Basin (hub: Fairbanks, secondary hub: Galena)		
Allakaket (133)	Huslia (293)	Nenana (402)
Alatna (35)	Kaltag (230)	Nulato (336)
Bettles (43)	Koyukuk (101)	Rampart (45)
Coldfoot (13)	Livengood (29)	Ruby (188)
Evansville (28)	Manley Hot Springs (72)	Tanana (308)
Galena (675)	Minto (258)	Wiseman (21)
Hughes (78)		
Seward Peninsula / Norton Sound (hub: Nome, secondary hub: Unalakleet)		
Brevig Mission (276)	Nome (3,505)	Teller (268)
Diomede (146)	Saint Michael (368)	Unalakleet (747)
Elim (313)	Savoonga (643)	Wales (152)
Gambell (649)	Shaktoolik (230)	White Mountain (203)
Golovin (144)	Shishmaref (562)	
Koyuk (297)	Stebbins (547)	

a. U.S. Census.

1.1 Northwest Alaska

The DOT/PF planning team worked extensively with the 26,000 people who live in the planning area's communities. Most communities are small (25-800 residents) and are served by the larger hub communities. The Northwest Arctic Borough, geographically the second largest borough in the state with 39,000 square miles and 8,000 people, has eleven communities, including its hub, Kotzebue. The North Slope Borough, geographically the largest borough in the state with 94,700 square miles and 7,000 people, has eight communities; Barrow is the hub community. In the remaining area (85,700 square miles), 11,000 people live in 35 communities. These communities are not organized into boroughs. Nome serves as the hub for the Seward Peninsula/Norton Sound communities and Fairbanks serves as the hub for the Yukon River communities.



Map 1-1 Northwest Alaska Transportation Plan Area

1.1.1 People

Most residents of the North Slope Borough, the Northwest Arctic Borough, and Seward Peninsula/Norton Sound are Inupiat Eskimo. Norton Sound is a traditional trading area and is home to a blend of Inupiat, Siberian, and Yup'ik, as well as Athabaskan Indians. The Middle Yukon River Basin people are primarily Athabaskan Indians. There are about 5,000 non-Native people in the entire region, primarily in the region's hub communities.

Alaska Division of Tourism

Figure 1-3 Ice Fishing

The Inupiat, Yup'ik, and Athabaskan cultures are some of the oldest, most intact indigenous cultures in the world. The success these cultures have had integrating modern education, commerce, technology, and health services into their traditional lifestyles have resulted in continued improvements to quality of life. Quality of life has also been enhanced by transportation improvements. The three cultures dominated the past in this region, and it has become clear in recent years that they will be a dominant presence well into the future.

Alaska DOT/PF

Figure 1-4 Northwest Arctic Borough Children

1.1.2 Economy

The region's primary day-to-day economy continues to be based on a blend of full and part-time jobs and subsistence activities. People hunt marine mammals and large and small game including birds. They fish year-round and collect eggs, berries, grasses, and other foods and products seasonally. Subsistence is central to the region's economy.

The area's Regional Native Corporations — Arctic Slope Regional Corporation, Northwest Alaska Native Association (NANA), Bering Straits Regional Corporation, and Doyon, Limited — are focal points for economic development in the region. Their primary businesses include mineral and energy resource development, heavy construction contracting, and commercial enterprises. Their non-profit counterparts — Arctic Slope Native Association, Maniilaq Association, Kawerak Incorporated, and Tanana Chiefs Conference, respectively — provide essential health, social, and cultural services and job opportunities in

the region. Village corporations provide local business and employment opportunities.

Traditional fisheries and trapping economies continue today. New fisheries, especially the Community Development Quota (CDQ) program in the Bering Sea, provide offshore and near-shore job opportunities and over time, investment opportunities.

Government transfer payments, in the form of medical assistance, income assistance, Bureau of Indian Affairs compact dollars, and the Permanent Fund Dividend, form an important source of income, accounting for 20-25% of the region's per capita wealth.

State, Federal, and local government job opportunities in health and education provide many year-round jobs, as do private sector commercial stores. Fuel delivery, electrical power production, and other utility-related services provide both a higher standard of living and several jobs per village. Like all communities, capital construction projects, including water/sewer, public buildings, road/airport, and other infrastructure projects, provide some employment opportunities although it is clear there are additional opportunities in this arena.

1.1.3 Land and Resources

Geography

The region has four major landforms — the North Slope, the Brooks Range, the Seward Peninsula, and the Yukon River Basin. The Bering, Chukchi, and Beaufort Seas are dominant coastal influences. The Colville, Noatak, Kobuk, Koyukuk, Tanana, and Yukon rivers are dominant waterways in the region.

The coast, where many communities are located, is generally low-lying land. Communities sited on sandy soils are becoming more susceptible to storm tide/wave damage. Several communities are subject to severe coastal erosion, and will need relocation or fortification in the future. Many river communities fight bank erosion that encroaches on communities and silting/river bars that impede navigation.

Alaska DOT/PF

Figure 1-5 Container Barge Being Unloaded to a Dirt Shore

Mineral/Energy Resource Development

The region's major resource development zones are the North Slope oil/gas fields, the western Arctic coal and zinc mining areas, copper deposits in the Ambler area, gold deposits in the Nome area, and the Yukon–Kuskokwim Rivers gold area. There are coal and mineral deposits throughout the region. While currently not practical to develop, in many cases they remain promising prospects for the future. It appears from the studies to date that industrial-level developments will continue to be focused in the North Slope/Western Arctic/Yukon River areas during the plan's

20-year horizon. Large placer mining districts in the Seward Peninsula, while not large-scale industrial developments, will continue to play an important role in the peninsula's development.

Land Status

Strategies for viable economic and transportation development in the Northwest Alaska planning area (219,664 square miles) are strongly influenced and limited by land status as shown in Map 1-2. Major landowners in the region include the Federal Bureau of Land Management (BLM) (37.6%), the State of Alaska (20%), and village and regional Native corporations (10.8%). Within these lands are found most of the region's known mineral and energy resource zones.

National Parks, Preserves and Monuments, National Wildlife Refuges, and other Federal conservation system units (CSU) occupy nearly one-third (31.2%) of the region. CSU land status not only legally protects the affected lands from development consideration, but also effectively deters development of potential transportation routes through these areas that could connect non-CSU lands. Strong legal barriers thus accent the natural geographic isolation of the North Slope, Seward Peninsula, and the Middle Yukon River Basin from each other and from the rest of the state.

Lands within and adjacent to communities are generally owned by cities and village corporations. Management of Native corporation lands is complicated by the distinction between surface rights (owned by the Native village corporation) and subsurface rights (owned by the Native regional corporation).

Privately held land is a comparatively tiny portion (0.3%) of the overall total, usually associated with mining claims; the largest concentrations occur in and around Nome, and scattered in the vicinity of Manley Hot Springs.

Wildlife/Subsistence Resources

Most of the subsistence wild food is composed of marine mammals, land mammals, fish, and birds and eggs. Commonly harvested marine mammals in the North Slope and Northwest Arctic areas include Bowhead whale, beluga whale, walrus, bearded seal, and ringed seal. Along the Seward Peninsula and Norton Sound coasts, sea otter, harbor seal, and sea lions are more prevalent.

Alaska DOT/PF

Figure 1-6 Whale Jaw Bones in Gambell

Land mammals harvested include caribou, polar bear, moose, Dahl sheep, and musk ox. Major fish varieties are Cisco (whitefish), Arctic char, grayling, and smelt in the North Slope and Northwest Arctic areas, while salmon, herring, halibut, and shellfish are more prevalent in the Seward Peninsula and Norton Sound coasts. The type of food harvested varies considerably among communities based on the availability of wild species in a community's traditional-use area.

Annual subsistence harvests range from about 151 pounds per person in the community of Manley Hot Springs to 997 pounds per person in Stebbins.

John Hyde, Alaska Dept. of Fish & Game
Alaska Division of Tourism

Figure 1-7 Fish Camp

1.2 Existing Transportation System

1.2.1 Northwest Arctic Borough

Northwest Arctic Borough communities are accessible year-round primarily by air. One airline provides daily passenger service from Anchorage to Kotzebue; several air taxi/charter services are based in Kotzebue, Ambler, and Kiana for inter-village travel. There are no inter-connecting community roads; where possible, land travel is over ancient trails by snowmachine or all-terrain vehicle (ATV). Excluding Noatak, all the communities receive summer barge freight service; year-round freight is by air cargo. The lack of interconnected roads means lighter goods such as mail and perishable food typically move by air. Bulkier, heavier materials like dry goods, fuel, and building materials arrive by ocean-going barge. The shallow depth along the entire Northwest Arctic Borough coastline means that cargo must be lightered ashore, even at the hub port of Kotzebue.

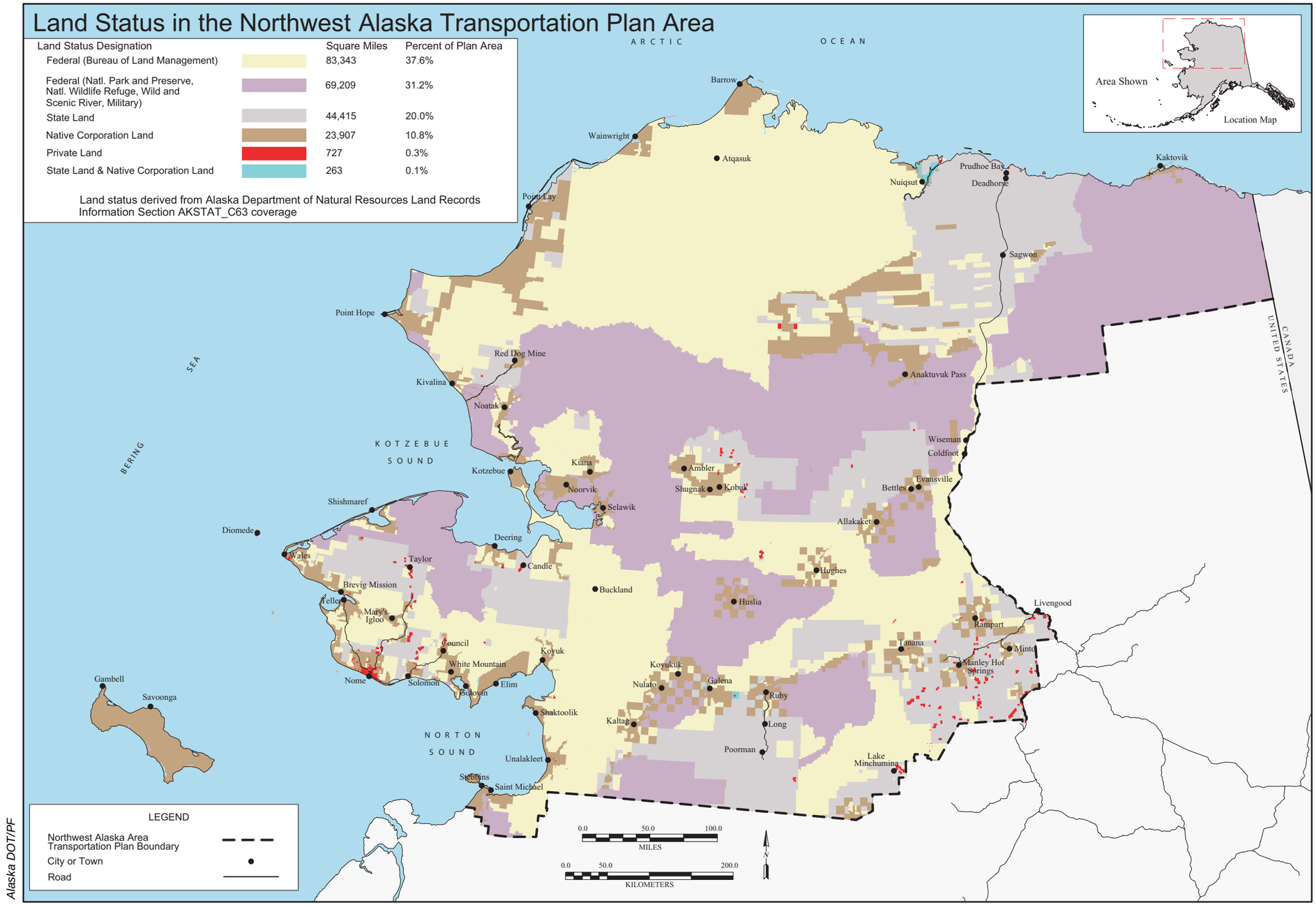
The DeLong Mountain Transportation System, north of Kivalina, consists of an industrial-use road, airstrip, and ore export terminal serving the Red Dog Mine.

1.2.2 North Slope Borough

North Slope Borough communities are accessible year-round primarily by air. The only road to the region, the Dalton Highway, parallels the Trans-Alaska pipeline from Fairbanks to Prudhoe Bay, and serves mainly as a freight corridor to the oil fields and a summer excursion for tourists. Where possible, inter-village overland travel is by snowmachine in the winter and ATV in the summer. Alaska Airlines provides passenger jet service between Barrow and the state's larger cities. Smaller commuter airlines travel between Barrow and the smaller communities in the Borough. Freight arrives at the coastal communities by barge in the summer and to all communities by air cargo year-round.

North Slope Borough

Figure 1-8 Barrow in Springtime



Map 1-2 Land Status in the Northwest Alaska Transportation Plan Area

1.2.3 Middle Yukon River Basin

The majority of the communities in the Middle Yukon River Basin area are accessible primarily by air. However, there are a handful of communities that are connected by road to Fairbanks via the Elliott Highway. Those communities are Manley Hot Springs, Minto, and Livengood. Inter-community overland travel is predominantly by snowmachine in the winter and ATV in the summer where possible. Small commuter airlines based in Fairbanks serve the villages with passenger and bypass mail service. Most freight and fuel arrives in the area via barge service; however, there are several communities that fly in some freight and fuel via DC-6 aircraft. There is no waterborne commercial passenger service in the area. Personal watercraft is the main mode of waterborne travel between communities located on the rivers.

Wiseman has year-round road access to the Dalton Highway, a 2,000-foot runway and a population of 21. Alatna uses the airport across the Koyukuk River in nearby Allakaket. Neither community relies on barge service because of the shallow water depth in the river. Neither has road connections, but both use winter trails to Hughes, Bettles, and Tanana. Hughes has an airport, no connecting roads, and uses the frozen Koyukuk River as an ice road in the winter. Bettles and Evansville share use of the Bettles airport. During four months of the year, the Hickel Trail, a 30-mile winter road, gives residents access to the Dalton Highway. They have no barge service.

1.2.4 Seward Peninsula/Norton Sound

The majority of the communities in the Seward Peninsula/Norton Sound area are accessible primarily by air. The community of Teller is connected to Nome via the Nome-Teller Road; the road is not maintained in the winter, however. Inter-community overland travel is predominantly by snowmachine in the winter and ATV in the summer where possible. Alaska Airlines provides the only jet service to the area at Nome. Smaller commuter airlines based in Nome and Unalakleet serve the outlying communities with passenger service and bypass mail. Most freight and fuel arrive in the area via ocean-going container barge to Nome or direct barge service to the communities. Some freight and fuel are delivered by air to several communities where runways are long enough to accommodate DC-6s. There is no waterborne commercial passenger service in the area with the exception of the occasional cruise ship that docks in Nome. Personal watercraft is the main mode of waterborne travel between communities.

Extreme weather conditions, few roads, and inadequate docking facilities impede the movement of people and goods in this area. Air transportation is the chief means of moving people to and from the region. Bulkier, heavier materials like dry goods, fuel, and building materials arrive by water. The communities depend on ports and harbors, and barge transfer sites for commercial freight purposes.

Airport runway length directly affects freight costs in the region by limiting the size of the aircraft able to safely land. The

communities of Nome, Unalakleet, Gambell, and Shishmaref each have runways 4,500 feet or longer. Air accident rates in the region have been increasing and the Federal Aviation Administration (FAA) is considering several airports in the region for participation in the Capstone program to increase air safety.

Only a few of the outlying communities are accessible by road during the summer months. Roughly 230 miles of gravel-surfaced roads connect Nome with Teller, Mary's Igloo, and Council (the latter two being seasonal use sites with no year-round residents). Traditional winter trails are the only means of transporting essential supplies to rural communities during the winter. The world-famous Iditarod Trail runs 1,151 miles from Anchorage to Nome and passes through the communities of Shaktoolik, Koyuk, Elim, White Mountain, and Unalakleet.

The Port of Nome provides the only major facility for boat moorage and repair in the region. There has been rapid growth of a commercial fishing fleet based at Nome as a result of the CDQ program. During the summer, barges bring fuel, construction materials, and large consumer goods to the region. ocean-going barges from Seattle and Anchorage deliver supplies to communities along the coast. Bulk fuel and freight delivery along the coast is hampered by the inadequate condition of docking and mooring facilities, navigation aids, and barge-to-shore fuel transfer systems.

1.2.5 Community Transportation

Within communities, most travel is by ATV in the summer and snowmachine in the winter. A few coastal and tundra communities use boardwalks over wetlands and soft tundra areas to accommodate ATVs that haul mail, water, sewage, and freight. Other communities have small road networks. In the region's larger communities, cars and trucks are a growing part of the vehicle fleet.

Alaska DOT/PF

Figure 1-9 ATVs near Gambell

The region's hub communities have vehicle fleets similar to most small towns in Alaska. People travel to hunting areas, fish camps, and other communities by skiffs and small boats on rivers and along the coasts during the summer. In the winter, they use snowmachines for hunting, trapping, ice fishing, and inter-community travel. A traditional trail marking system is the basis for much of the winter travel. Like the rest of rural Alaska, barge delivery of fuel and deck freight and the aviation-based bypass mail system are critical transport services in Northwest Alaska.

1.3 Developing the Plan

DOT/PF worked extensively with Northwest Alaska communities and businesses to ensure that the plan accurately incorporates the transportation goals of the region. Each of the four subregions developed a memorandum of agreement with the department so they could lead the public meetings in their respective areas. The two boroughs and the tribal non-profits for the non-borough regions not only led the meetings, they arranged the meeting times and places in ways that promoted the best possible public participation. The regional groups also provided interpreters as needed so each community's elders could fully participate in the meetings. High respect accorded to elders and their insightful input into the future of their communities made their participation critically important to the success of the winter meetings. The combination of local scheduling, having regional leaders introduce and facilitate the meetings, and having the full participation of community elders resulted in the planning team developing a solid understanding of community and regional transport needs.

Alaska DOT/PF

Figure 1-10 Community Planning Meeting

The DOT/PF Northwest Alaska Transportation planning team consisted of Headquarters and Northern Region planning and engineering staff. The team received valuable assistance from DOT/PF Maintenance and Operations staff. During three winters of work, the team was continuously meeting with communities. It is only during this time of year that people have the time to focus on these types of tasks. Also during the winter, the team worked with businesses and agencies. In the summers, when residents and businesses were fully engaged in their summer season tasks, the planning team prepared reports based on each winter's work.

The planning team also met at least annually with an Advisory Committee (Figure 1-12) composed of regional community, business, and Native leaders. Their task was to review progress and guide the team's work.

The public involvement process was critical to the success of the plan. Through receiving public comments, DOT/PF was able to define needed improvements to transport systems and to avoid projects that were contrary to the goals of the region's communities.

1.3.1 Goals and Objectives

Goals for the plan were established during early public involvement efforts and are similar to the goals in other area plans:

- Identify basic transportation projects that improve safety and enhance quality of life for the region's 26,000+ residents
- Identify transportation infrastructure projects needed to

support economic development opportunities

Goals and objectives for this regional plan draw heavily from the work done by regional leaders in the April 2000 Arctic Economic Development Summit and goals prepared for other area transportation plans. The goals and objectives established emphasize efficient, reliable, and safe transportation systems, responsible economic and energy development, and local management of subsistence and wildlife resources. The established goals for the Northwest Alaska Transportation Plan are listed in Table 1-2.

These goals and objectives provided direction for the overall Northwest Alaska Transportation planning effort.

John Kauffman, National Park Service
Alaska Division of Tourism

Figure 1-11 Arrigetch Peaks, Gates of the Arctic National Park

Northwest Alaska Transportation Plan Advisory Committee
February 2002

Michael Aamodt
North Slope Borough Assembly

George N. Ahmaogak, Sr.
Mayor
North Slope Borough

Johne Binkley
Alaska Railroad Corporation

Marie Greene
Acting President
NANA Regional Corporation

Bear Ketzler Jr.
Planning Director
Tanana Chiefs Conference

Ray Koonuk
North Slope Borough Assembly

Oliver Leavitt
President
Arctic Slope Regional Corporation

Max Lyon
Transportation Director
Fairbanks North Star Borough

Norm Phillips
Engineer Geologist
Doyon, Limited

Clyde Ramoth
Tribal Representative
Northwest Arctic Borough

Leo Rasmussen
Mayor
City of Nome

Julianne Salmon
Transportation Director
Kawerak Incorporated

Walter Sampson
Northwest Arctic Borough Assembly

Ross Schaeffer
Mayor
Northwest Arctic Borough

Tim Towarak
President
Bering Straits Regional Corporation

Larry Westlake
Northwest Arctic Borough Assembly

Board Member
Kawerak Incorporated

Figure 1-12 Northwest Alaska Transportation Plan Advisory Committee

Table 1-2 Goals and Objectives (Page 1 of 2)

Goal	Associated Objectives
Goal 1: **Provide Basic Access for Health, Education and Safety** ***Provide communities of Northwest Alaska with usable and safe access to clean water, sanitation, and basic social services, including medical services, schools, and law enforcement.***	• Provide aviation facilities meeting sufficient standards to allow for safe and reliable medical evacuations. • Provide and/or maintain facilities allowing regional access into and out of communities having at least 25 permanent year-round residents. • Where practical, provide access to communities via more than one mode of transportation. • Provide winter trail markers for inter-community winter travel. • Encourage the establishment of local social service providers so as to minimize the need for inter-community travel. • Maintain winter trail markers on inter-village trails and roads.
Goal 2: **Assure the Preservation of the Needed Transportation System** ***Preserve and maintain existing transportation facilities and services that have been identified as necessary for both current and future conditions.***	• Promote reliable revenue mechanisms that provide adequate funding for operation and maintenance of existing and future transportation systems. • Implement institutional changes and provide training and skills development at the local government level to allow local operations and maintenance of selected transportation facilities. • Examine opportunities for collection of user fees and generation of other funds by a specific facility/service for the preservation and maintenance of those same facilities/services. • Identify existing facilities or services not needed in the future. • Assess airport runways to see if carriage of mail and passengers together requires runway upgrades.
Goal 3: **Enhance Transportation System Efficiency** ***Provide regional transportation facilities and services in the most efficient and cost-effective way possible.***	• Identify and connect regional and subregional hubs with the surrounding service area by road where practical and desired by the affected communities, so as to support consolidation and improvement of regional and subregional facilities and services. • Provide missing intermodal links that would enhance the efficiency of the transportation system. • Minimize transportation system directional flow imbalance by identifying means to exploit backhaul potential. • Minimize travel delays due to weather conditions. • Improve connections and scheduling between transportation modes. • Maximize occupancy/ridership per trip (“utilization factor”) on existing facilities or services. • Enhance coordination between passenger and freight services. • Seek ways to consolidate system operation and maintenance requirements (e.g., through consolidating power, landfill, safety/fire, school, fiber-optics, aviation, medical, and harbor facility needs). • Implement appropriate instrumentation and technological advancements to enhance system efficiency. • Provide mechanisms for the dissemination of current travel information so travelers can plan their trips more efficiently. • Identify data collection needs and develop transportation system performance monitoring systems. • Build appropriate institutional relationships involving public and private sector users as well as providers and regulators of the Northwest Alaska intermodal transportation system for ongoing dialogue on the efficiency of the system. • Identify existing facilities or services not needed in the future.

Table 1-2 Goals and Objectives (Page 2 of 2)

Goal	Associated Objectives
Goal 4: **Improve Transportation Levels of Services** ***Support improvements to the frequency, reliability, and quality of regional transportation services.***	• Promote reliable revenue mechanisms that provide adequate funding improvements to the existing transportation system. • Identify and connect regional and subregional hubs with the surrounding service area where practical and desired by the affected communities, so as to support consolidation and improvement of regional and subregional facilities and services. • Improve connections and scheduling between transportation modes. • Implement appropriate instrumentation and technological advancements to enhance system effectiveness. • Build appropriate institutional relationships involving public and private sector users as well as providers and regulators of the Northwest Alaska intermodal transportation system for ongoing dialogue on the effectiveness of the system.
Goal 5: **Enhance System Adaptability and Flexibility** ***Develop and maintain a regional transportation system that can effectively adapt to changing physical, economic, and demographic conditions.***	• Prioritize transportation improvements based on long-term needs. • Make intermodal connections. • Review and update master plans for regional class airports on a regular basis and for other airports as needed. • Review and update the Northwest Alaska Transportation Plan on a regular basis. • Collect and maintain transportation data so as to monitor regional travel trends. • Encourage the use of vehicles with flexible passenger/freight interchangeability. • Maintain or acquire right-of-way for potential future transportation uses. • Implement appropriate instrumentation and technological advancements to enhance system flexibility. • Provide mechanisms for the dissemination of current travel information so travelers can plan their trips more efficiently. • Reduce regional dependency on funding decisions based on annual legislative appropriations. • Encourage local and regional partnerships to support transportation facilities.
Goal 6: **Develop and Protect Economic and Subsistence Resources** ***Provide transportation facilities that enhance regional economic vitality while maintaining the region's unique environmental and cultural resources.***	• Increase access where desired and needed to facilitate economic development. • Minimize environmental impacts of the transportation network. • Maintain environmental integrity of Northwest Alaska. • Improve marine launching sites or dock facilities. • Eliminate transportation barriers to tourism development in communities with plans for service sector growth. • Provide mechanisms for the dissemination of current travel information so travelers can plan their trips more efficiently. • Develop functional access plans that reflect local plans for economic development and local resident needs.

1.3.2 Purpose and Need

The plan's goals (articulated with the help of the plan's Advisory Committee) provided the starting point for the Purpose and Need Statement for the Plan. The Purpose and Need Statement for a transportation project is the foundation statement describing what is to be improved and why. It serves as a very important screening tool in considering and reviewing transportation alternatives. Alternatives that reasonably satisfy the Purpose and Need are considered viable solutions to the transportation issues at hand. Alternatives that do not are rejected from further evaluation in the National Environmental Policy Act (NEPA) project development process.

The primary regional source for guidance came from the plan's Advisory Committee. The Committee, comprised of regional community, business, and Native leaders, provided a solid source of guidance on transportation concerns, ideas, and issues in the region.

Another source of regional guidance came through the Arctic Economic Development Summit held in Kotzebue on April 17, 18, and 19, 2000. This historic meeting of the North Slope and Northwest Arctic Boroughs, along with local residents, State and Federal officials, and many Alaska business leaders, developed vision statements and listed core values in establishing guiding principles for economic development in the Arctic region of Alaska.

Finally, direct public input received in public meetings and several written communications from residents and organizations provided important public expressions of transportation need. The high level of support for the planning process to date further supports the state's decision that this plan represents the best overall public interest.

Based on these various sources of public input the following Purpose and Need Statement for this project was prepared.

Purpose and Need Statement
Northwest Alaska Transportation Plan

To improve intra- and inter-regional connectivity by developing transportation links for access, trade, and local resource development sensitive to traditional values and land use by the region's peoples, and to improve transportation safety, service, flexibility, and efficiency for users and the State.

The concepts included in Table 1-3 collectively express the purpose and need of individual projects stemming from this regional transportation plan. Overall, the department believes that this transportation plan largely meets these public expressions of purpose and need.

Table 1-3 Purpose and Need for Transportation Improvements in Northwest Alaska

Goal	Purpose & Need Objective	Strategy	Need Identification
Intercommunity Links	Connect communities to hubs by road.	• Develop Yukon River Highway.	• Public Meetings: Residents identified the need for economic diversification and consolidation of services to sustain communities.
Transportation System Safety	Protect air passengers from the weather.	• Provide protected waiting areas for passengers at community airports.	• Public Meetings: Identified the need to protect arriving/ departing/ stranded passengers from harsh weather.
Transportation System Safety	Improve air safety and navigation through implementation.	• Implement the Federal Aviation Administration (FAA) Capstone Program in Northwest Alaska.	• Air Carriers' Input: Success of the Capstone program in other regions significantly reduces accident risk.
Transportation System Safety	Improve airports to accommodate newer aircraft and provide for safe landings and departures.	• Where feasible, make improvements to assure that all airport runways meet the minimum standards for lighting and runway length.	• Air Carriers' Input: Physical constraints imposed by existing airports on the make-up of their existing fleets, and high dependency on aircraft that are no longer manufactured.
Transportation System Safety	Improve the safety of inter-community travel on trails in the winter.	• Develop a program to improve safety on inter-community trails by providing standards for marking and navigation, as well as regular funding.	• Public Input: Local communities consider winter trails the "highways" of the region. Residents all want well-marked and safe winter trails, but differ as to priorities and uniform standards and who should have oversight.
Transportation System Efficiency	Improve system usage and lower per-trip costs to users and government.	• Encourage partnerships and appropriate sharing of costs among all potential beneficiaries. • Identify marine freight entry points and intermodal transfer facilities when evaluating corridors for future road networks. • Target road improvements that offer opportunities to consolidate airport facilities.	• The Advisory Committee frequently expressed the need to reduce the level of user costs and state costs. • The level of funding support has been reduced repeatedly by the state legislature, resulting in reduced capability by DOT/PF to operate and maintain roads and airports. A more efficient system is more sustainable, because it encourages beneficiaries to share in the costs, ensuring service over the long term.
Improve Barge Operations	Improve the flow and cost of goods to communities.	• Improve efficiency of barge transfer operations in communities by improving infrastructure for barge-to-shore connections.	• Public Input: Community residents rely heavily on barge service for fuel delivery and experience a slowdown in service due to a lack of infrastructure for transfer operations.

1.4 Community Transportation Analysis

The four CTA findings outlined in the following sections are consistent with transportation plans for other rural Alaska areas.

1.4.1 Winter Trails

During the winter months, snowmachine travel between communities, and travel to fishing and hunting areas is the primary personal transport mode. As machines have become faster and more durable, longer trips have become more frequent. Many snowmachine operators use Global Positioning System (GPS) navigation and radio communication, but there is also a strong need for winter trail marking.

While there has been a constant volunteer effort to mark common trails, especially the over-water portions, there has been a recent move to develop a more formal trail network throughout arctic, interior, and western Alaska.

DOT/PF Northern Region staff work with regional and community Search and Rescue personnel to set up winter trail projects. The goal is to allow people to use their GPS equipment on the trails through waypoint mapping, and to have one tripod marker system in place for consistency. One other recent development is moving some mainline trails away from water bodies to reduce over-water routes where many accidents occur.

DOT/PF is working with the Denali Commission and others to fund the winter trails network over the next 5-8 years.

1.4.2 Aviation

Statewide and regional air carriers will continue to provide and improve passenger, airfreight, and bypass mail services. Alaska has some of the world's most challenging aviation conditions and air carriers work very hard to provide safe, frequent service, while struggling to contain the high costs of operations in sub-arctic and arctic conditions.

Alaska DOT/PF

Figure 1-13 Bypass Mail Delivery in Diomede

During the last five years, the aviation system has seen significant business cost increases and regulatory challenges. Recent changes to the bypass mail system provide some stability to the regional carriers after three years of increasing difficulties in providing top-notch mail delivery. Bypass mail provides a valuable contribution to the quality of life in rural Alaska both in terms of mail delivery and passenger service opportunities it provides.

Another significant positive development in aviation is the FAA-sponsored navigation system being tested in Alaska called Capstone. Capstone is a program combining GPS-based navigation and avoidance aids and improved weather

report access for each commercial aircraft operating in an area. Air carriers, passengers, and the FAA have rated the Capstone system a tremendous success in the Yukon-Kuskokwim Delta. Regions that have not been selected as test areas look forward to this equipment's availability in the near future.

Aviation will remain the primary transportation mode for long distance transport over the 20-year window used in DOT/PF area plans. The services, while increasing in cost, still provide excellent day-to-day connections between communities and between communities and their regional hubs. The regional hub to urban hub connection is also critical to rural communities and will continue to play a critical transportation role. DOT/PF has developed a series of airport improvements designed to address the changes expected over the next twenty years.

One small-scale project sought by almost every community is an airport shelter. The need for these buildings is due to the increasing numbers of people having to wait at airports located a significant distance from the communities they serve.

The need for adequate airport shelters is a result of two contributing factors occurring over time:

- More air traffic moving through airports, and
- The relocating of airports further from communities to improve operational safety and to meet the needs of larger aircraft moving into rural routes.

These factors mean people are left more often at open sites, without shelter, a mile or more from the community. This is an important small-scale project that the FAA and the Denali Commission have expressed interest in getting put into place as expeditiously as possible.

1.4.3 Ports, Harbors, and Shipping

Most communities throughout the planning area will continue to use diesel fuel as their primary heating and energy production sources. Several significant efforts are underway to reduce use of diesel fuel, including wind generators at Kotzebue. Small wind generators are being tested at several communities. Until other power sources are available, however, ocean and river barges will continue to provide a vital service by delivering fuel during a short period in the summer.

In each of the four subregions, barge operators struggle to get a year's fuel supply to each community. Because the total population in each subregion is small and operating costs are high, the cost per gallon for power generation and vehicle/equipment fuels has been in the $3.00 a gallon range for several years. Improving barge-to-shore connections will improve efficiency and potentially reduce insurance fees. These business improvements will speed summer deliveries and potentially reduce fuel costs. Shore connection improvements include secure anchoring systems, gravel pads for deck freight, and fuel headers onsite.

Alaska DOT/PF

Figure 1-14 Riverine Barge Unloading to Bank

DOT/PF is working with communities, barge operators, and others to identify long-term barge landing needs. The Denali Commission is working with the department to understand project costs and timing with the goal of building the majority of these facilities within a ten-year period.

Currently, aircraft carry fuel to many upriver communities or communities with near-shore navigation problems. This service has increased over the last five years, and can be expected to grow.

The increase is facilitated by growth in the airfreight fleet, making more aircraft available for fuel haul work. More aircraft available for fuel haul and lower fuel costs from new regional fuel distribution centers may make staging aircraft in regional hubs more cost-effective for businesses. The combination of more available aircraft and better regional fuel distribution systems is likely to enhance fuel haul opportunities. Community airports likely to receive fuel under this scenario were identified during the planning process. Airport improvements for these communities include the capability for fuel delivery by DC-6 aircraft.

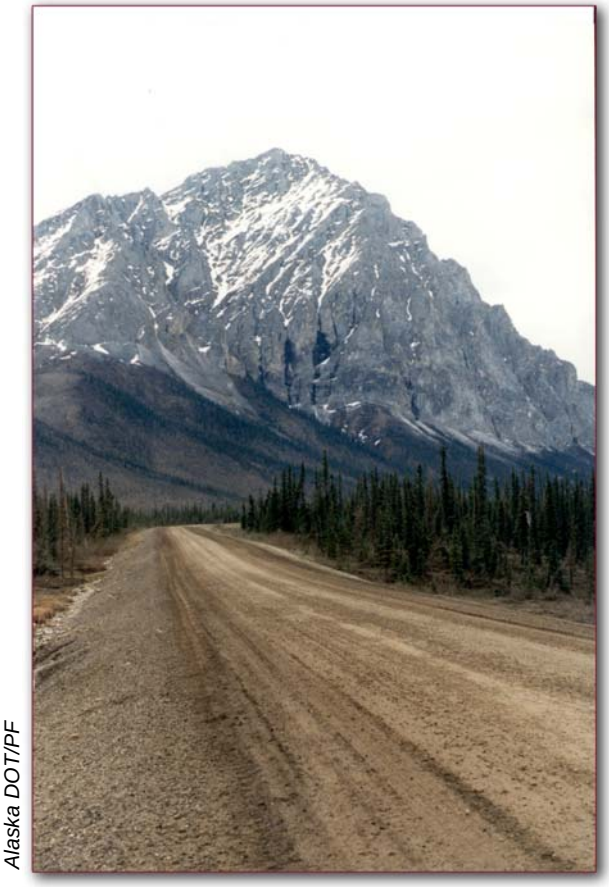
1.4.4 Roads

When DOT/PF began the first round of community meetings for the plan most communities were opposed to roads largely because of concerns about impacts to cultural integrity and fish and wildlife resources. However, over the course of the planning effort, problems with the bypass mail system, significant increases in air fares, and rising fuel costs delivered by barge prompted many communities to discuss the need for roads during recent winter meetings with the planning team.

Most frequently, road requests are to connect communities like Elim, White Mountain, and Golovin so the three communities can take advantage of the lowest cost barge operation. Other connections, like Wales to Brevig Mission, are designed to improve barge service and improve community connections. Most communities along the south flank of the Brooks Range and the upper Koyukuk River requested that DOT/PF focus on aviation and winter trail improvements; they generally felt that connecting to the state's highway system would not be in their best interests.

With the exception of Point Hope, most North Slope communities generally felt that future road connections between communities and Barrow will be good for the region. Nuiqsut has expressed interest in an all-season connection to the existing oilfield roads 20 miles to the east in order to access the Dalton Highway and the Deadhorse Airport. The community currently has 5 to 7 months of access during the winter-spring seasons. Kaktovik and Anaktuvuk Pass, whose people both

expressed interest in roads to the Dalton Highway, are too far from the Dalton and have insufficient populations to make road connection practical. However, their concerns about airfares and fuel costs are real.



Alaska DOT/PF

Figure 1-15 Dalton Highway

Many people in the four subregions are opposed to road development from the interior to Northwest Alaska because of concerns about impacts to the community lifestyle, especially to subsistence uses of fish and wildlife resources. To limit the risk of having development perceived as a potential threat to traditional lifestyle and land use, the planning team followed the recommendations of the regional governments and the public. These recommendations, discussed below emerged after extensive discussions with community and regional leaders and many public meetings in the communities.

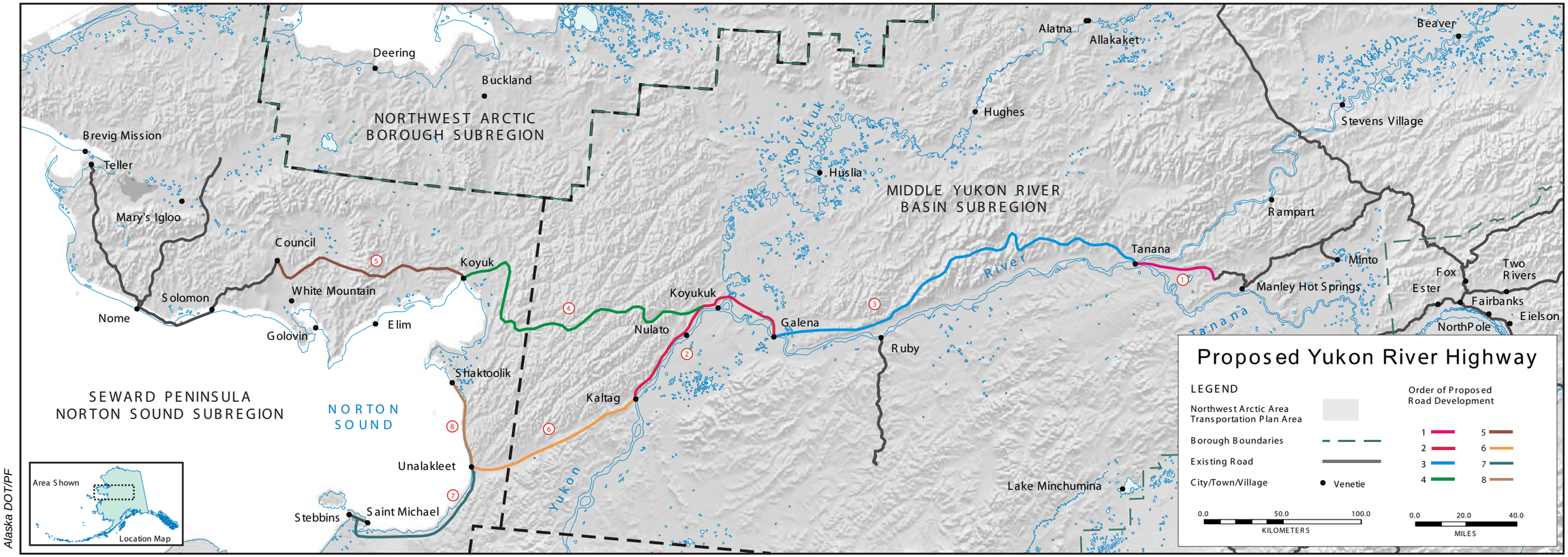
Recommendation 1: No overland routes from the Dalton Highway into the Western Brooks Range area

Community preferences and the difficult land status in the Northwest Arctic Borough led the planning team to recommend against community purpose overland routes from the Dalton Highway into the western Brooks Range area. In this area, the department will focus its attention on the aviation network, local roads, and improving barge operations.

Recommendation 2: Explore development of a Yukon River Highway

The tribal non-profit corporation Tanana Chiefs Conference (TCC) recommended and DOT/PF agreed that the two organizations work together to examine the benefits and impacts of building a road along the Yukon River. Initial opposition to regional roads along the Yukon River transformed into a consensus that a road might be beneficial to sustaining communities. The first generations of work would connect outlying communities to their hub community and later generations of work would connect the region to Nome and the state highway system.

This project is called the Yukon River Highway and it is the most significant road proposal in the CTA (see Map 1-3). The proposal has grown primarily out of concerns over rising costs, but also concerns over the absence of strong business and job opportunities for the communities along the Yukon River. The collapse of the commercial fisheries and



Map 1-3 Proposed Yukon River Highway

the trapping trade has created the need for a new economy based on commercial trade at the regional hub level, and tourism.

The next step in this proposal is a partnership between TCC and DOT/PF to perform a reconnaissance-engineering analysis and a study of a road's social, economic, and cultural effects so the communities can make an informed decision about whether to proceed to a design stage for the route.

Many small-scale economic development road projects were identified during the planning process, ranging from gravel access to new commercial boat launching sites and evacuation routes.

DOT/PF is working with the Denali Commission, the Bureau of Indian Affairs (BIA) and others to fund projects in a priority order based on economic value to communities as well as quality of life attributes for residents.

Dust control on community roads and airports is needed throughout rural Alaska. DOT/PF has joined with other organizations to work on an expedited program to address dust control needs. DOT/PF, funded in part through a Denali Commission grant and in part through Federal-aid highway research money, is conducting dust control projects in Kotzebue and in the communities in the Nome area. Hard surfacing roads in larger communities and annual applications of dust retardant chemicals on small community roads or where soils are unsuitable for hard surfacing is underway.

City of Kotzebue

Figure 1-16 Road Paving in Kotzebue

1.4.5 Conclusion

All transportation improvements identified in the plan have been coordinated with the region's local governments. Many CTA projects identified in the early stages of the plan have been or are being incorporated into the department's Statewide Transportation Improvement Program (STIP) and Airport Improvement Program (AIP). The remaining CTA projects will be incorporated into the STIP and AIP programs as funding becomes available.

DOT/PF is continuing to work with BIA to joint venture on projects or to transfer funds between agencies in an effort to move projects to construction. Both DOT/PF and BIA are working with the Denali Commission to increase funds available for rural road construction projects.

DOT/PF is committed to an analysis that illustrates construction and maintenance costs, investigates cost sharing opportunities, determines timing and feasibility of constructing access, and outlines the economic and social benefits that would result from projects.

Chapter 2. Winter Trails

Winter weather conditions in Northwest Alaska do not confine people to the indoors. Residents depend on subsistence fishing, hunting, and trapping to provide food and income throughout the winter. They also travel to hub communities for education and medical purposes and to buy consumer products and fuel. An important cultural tradition for many residents is traveling to other communities to visit friends and relatives.

Tim Thompson, Alaska Division of Tourism

Figure 2-1 Dog Mushing in the Far North

Trails in Northwest Alaska are as actively used as the road system in central Alaska. There are few inter-community roads in Northwest Alaska, so during the winter, snowmachines and sleds are the major mode of travel. However, the trails are also quickly erased by winds and blowing snow that occur regularly. Frequent white-out conditions can make following trails nearly impossible.

Recent advances in Global Positioning System (GPS) technology and the development of more reliable snowmachines have not been able to significantly reduce the risks of overland travel in remote Alaska. The residents living in Northwest Alaska consistently express their desire to develop a well-marked and mapped winter trail system. Throughout the public involvement process, community representatives, especially Native elders, emphasized the importance of the trail system and considered trail markers to be the most important day-to-day travel safety improvement needed. Residents also recommended that directional signs be of standardized materials and visible from the air.

Traditionally, trail markers of alders and willow were used to mark direction changes in the trails and to identify hazardous areas, but most stretches were unmarked. From the early 1970s to the mid-1980s, DOT/PF constructed trail markers and safe haven cabins for some winter trails in rural Alaska under the Local Service Road and Trails program. Driftwood tripods and colored blazes were added to the traditional alder and willow markers. This winter trail system relied heavily on local coordination and volunteer work, which was insufficient for the maintenance of the entire system.

2.1 System Description

Trails are an important mode of travel in this large region with few roads. Travel between communities in the winter is often done by snowmachine or sled. In many instances, trails used for these purposes

are not marked. Trail markers, GPS coordinates, and maps are needed to provide safe travel for the area residents.

The following tables provide information about existing trails that was collected during meetings with the public and tribal non-profit organizations in the region. Funds permitting, DOT/PF would like to assure that all trails are marked and mapped.

Table 2-1 Northwest Arctic Borough Trails

Trail Segments	Distance (miles)
Kobuk to Shungnak	10
Kiana to Noorvik	20
Shungnak to Ambler	25
Ambler to Kobuk	30
Buckland to Deering	40
Kivalina to Noatak	45
Deering to Lane River (Shishmaref Trail)	50
Noatak to Kotzebue	50
Kiana to Kotzebue	50
Noorvik to Kotzebue	50
Selawik to Buckland	50
Kivalina to Point Hope	80
Shungnak to Selawik	80
Kivalina to Kotzebue	85
Kobuk to Hughes	100
Noatak to Kiana	120
Kiana to Ambler	80
Total Mileage	**965**

Table 2-2 North Slope Borough Trails

Trail Segments	Distance (miles)
Point Hope to Kivalina	80
Barrow to Atqasuk	60
Deadhorse to Nuiqsut	60
Atqasuk to Wainwright	70
Barrow to Wainwright	90
Wainwright to Point Lay	100
Point Lay to Point Hope	120
Nuiqsut to Anaktuvuk Pass	140
Nuiqsut to Atqasuk	150
Total Mileage	**870**

Table 2-3 Middle Yukon River Basin Trails

Trail Segments	Distance (miles)
Allakaket to Bettles	40
Hughes to Allakaket[a]	75
Hughes to Bear Mountain	50
Hughes to Hog River	40
Hughes to Huslia[a]	90
Huslia to Galena	100
Huslia to Hot Springs	50
Huslia to Koyukuk[a]	120
Kaltag to Grayling	150
Koyukuk to Galena[a]	25
Koyukuk to Nulato[a]	35
Manley to Minto	50
Manley to Nenana	120
Manley to Tanana[a]	65
Minto to Nenana	40
Minto to Old Minto	15
Nulato to Kaltag[a]	30
Ruby to Galena	60
Ruby to McGrath	150
Ruby to Tanana	120
Tanana to Allakaket[a]	120
Total Mileage	**1,545**

a. Tentatively scheduled for marking in the near future.

Table 2-4 Seward Peninsula/Norton Sound Trails

Trail Segments[a]	Distance (miles)
Shishmaref to Halfway to Brevig/Teller	35
Shishmaref to Lane River (Deering Trail)	50
Shishmaref to Teller East	80
Shishmaref to Teller West	90
Shishmaref to Serpentine Hot Springs	40
Saint Michael to Kotlik	80
Unalakleet to Saint Michael	60
Unalakleet to Shaktoolik	44
Unalakleet to Kaltag	80
Shaktoolik to Koyuk	50
Koyuk to Elim	45
Koyuk to Buckland	80
Elim to Golovin	30
Golovin to White Mountain	20
White Mountain to Council	20
White Mountain to Solomon	30
Solomon to Nome	28
Nome to Teller	80
Nome to Serpentine Hot Springs	110
Nome/Taylor to Pilgrim Hot Springs	14
Wales to Brevig Mission	50
Wales to Shishmaref	70
Gambell to Hugo Camp	40
Gambell to Savoonga	50
Savoonga to Hugo Camp	50
Total Mileage	**1,326**

a. Many of the trails in the Seward Peninsula/ Norton Sound area were marked in 1997 but were not verified by GPS.

2.2 Trail Markers

Trail markers lead disoriented travelers to the nearest community, let travelers know distances to their destinations, and warn travelers about trail changes, including transitions from uplands to rivers or bays. Markers are also valuable aids in airborne search and rescue efforts by guiding search and rescue teams to lost travelers.

Recent Projects

In 2001, a project was started that marked approximately 580 miles of trail in the Yukon-Kuskokwim Delta area. This project was coordinated with the Association of Village Council Presidents and Tanana Chiefs Conference and was immensely successful. DOT/PF signed agreements with these organizations to provide funding for the project and the communities provided the manpower for installation and maintenance of the tripods. Once the Lower Yukon trails were marked, they were then marked again using a hand-held GPS device.

Alaska DOT/PF

Figure 2-2 Trails Marked with Tripod Markers near Nunam Iqua

The markers used in the Lower Yukon project were tripod style, lashed together with stainless steel bailing wire. Reflective tape was used to enhance the visibility of the tripods during low light and inclement weather conditions. These markers were placed an average of 200 to 500 feet apart, at times closer depending on the

terrain and sight distance. In some cases, trails marked were on waterways. The communities in these areas agreed to remove these markers prior to break-up and re-install them after freeze-up. The supplies were shipped to each community, and then crews traveled by snowmachines with one day's supply of markers on sleds, often working under challenging winter conditions. Work could not be done in summer because wet tundra soil and vegetation does not support vehicle or foot traffic. One of the problems the crews encountered was how to anchor the tripod in areas where they would not sink into the tundra in high wind. Duckbill anchors were provided to some communities for anchoring purposes.

Near-term projects in the Statewide Transportation Improvement Program (STIP) will fund trail markings between several communities along the Yukon River (see Table 2-3). As funding allows, additional trail sections will be marked in the Seward Peninsula/Norton Sound, North Slope Borough, and Northwest Arctic Borough subregions.

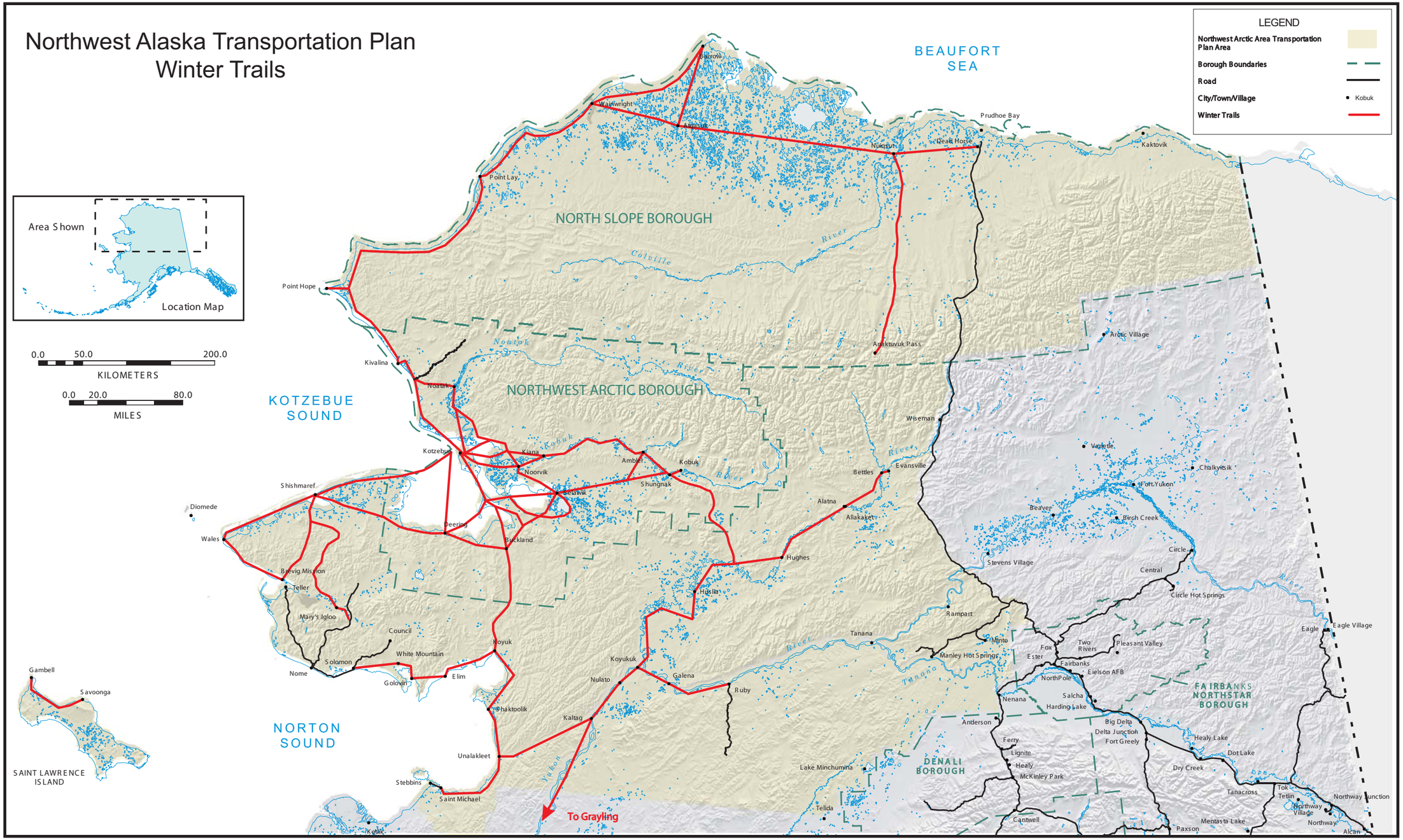
Alaska DOT/PF

Figure 2-3 Toft Road in Manley Hot Springs

Tripod Design & Placement

With the emphasis on visibility and a more maintenance-free design, DOT/PF developed a standard design for trail marking, including reflective blazes and signage. Many features are drawn from a traditional design used on the annual Iditarod dog race trail. In the Nome area especially, the markers are a tripod design, spaced about 200 feet apart. These tripods are visible in almost all winter conditions and are easily visible from the air for search and rescue efforts. That successful design is now DOT/PF's design standard. In addition, GPS coordinates will be used to create accurate maps of the trails once marked. This will enhance the ability of a traveler to determine their location and then follow the markers to a community. The tripod design will allow the traveler to wrap a tarpaulin or other cloth around the tripod and have a sheltered area while waiting for the search team to find them if they are immobile. Eventually, trail maps will be produced and made available to community search and rescue organizations, Village Public Safety Officers, and community residents.

Tripod markers will be made of three pieces of eight-foot long untreated wooden round stakes held together with wire. Trail markers will be labeled with an information sign at trail intersections and each leg will be marked with colored reflective tape.



Map 2-1 Winter Trails in Northwest Alaska

Alaska DOT/PF

The trail markers are freestanding and movable. It is not the intention to establish or require dedication of easements for the trails marked by these projects. Local residents who use the trails will determine the routes. Trail locations will be identified using coordinates from a GPS receiver. At a minimum, coordinates will be taken every fifth stake or major bend in the trail. Trail markers will be installed during the winter, because many routes are not accessible until the surface is frozen.

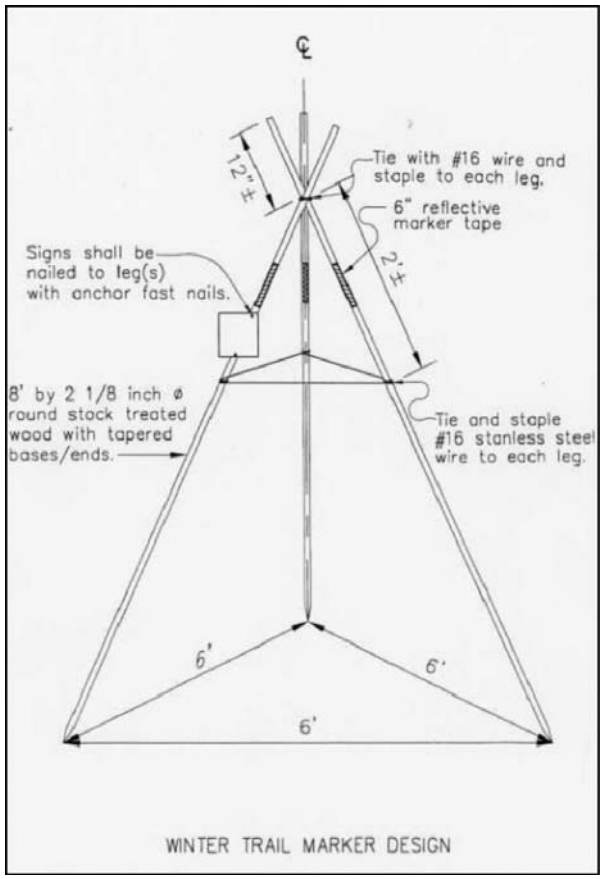


Figure 2-4 DOT/PF's Winter Trail Marker Design

Trail markers will be installed at maximum intervals of 500 feet. The distance between specific markers will vary with terrain, wind, and soil conditions as determined by the local residents performing the installation. Installers place markers as close as 100 feet where/when terrain and white-out conditions warrant. Installers place markers at the edge of rivers, lakes, and the coast to alert travelers to ice danger.

2.3 Project Management

All winter trail-marking projects to date have been managed through sole-source contracts. Under this system, DOT/PF contracts with local entities that hire the labor and are accountable to the department.

In the Yukon-Kuskokwim Delta and Yukon River Basin area, DOT/PF contracted with United Village Incorporated for the 1995 project, with the Association of Village Council Presidents for the 1996, 1997, and 2001 projects, and with Tanana Chiefs Conference for the 2001 project. These entities are Alaska Native not-for-profit corporations providing public services to the area residents. They administered the projects, which included hiring community residents, documenting payroll and other costs, and providing final reports to the DOT/PF for reimbursement of costs.

There was significant support by area residents to continue to contract trail-marking projects locally to provide more community jobs.

Future projects will likely use local non-profit organizations for project administration. Each community organized a three-person work team to mark the trails. These teams consulted elders within the community to discuss the appropriate

routes to be marked based on traditional use. The elders and search and rescue crews also provided information on dangerous areas, difficulties experienced in the past on existing routes and which routes tend to change due to blowing snow.

2.4 Funding

The Transportation Equity Act of the 21st Century (TEA-21) of 1998, and its predecessor, the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, have provided funding through the surface transportation program. In 1997, approximately 300 miles of trail were marked in the Bering Straits and Kotzebue areas. Near-term projects in the STIP will fund trail markings between communities along the Yukon River. As funding allows, additional trail sections will be marked in the Seward Peninsula/Norton Sound, North Slope Borough, and Northwest Arctic Borough subregions.

Barry Whitehill, Alaska Division of Tourism

Figure 2-5 Snowmobiling near Bettles

2.5 Recommendations

The Northwest Alaska Transportation Plan winter trails funding and management recommendations are:

- Maintain funding through the Statewide Transportation Improvement Program (STIP) for the construction of winter trails to complete the winter trail system, particularly in the Seward Peninsula/Norton Sound and Northwest Arctic Borough subregions. Both areas have numerous trails connecting communities that are inadequately marked and maintained.
- Attempt to use local labor for projects to provide much-needed employment of area residents and reduce overall project costs.
- Establish maintenance agreements for trail markers with communities or tribal organizations.

Chapter 3. Aviation

The objective of the aviation component of the Northwest Alaska Transportation Plan is to examine each of the community airports in the Northwest region of Alaska in order to determine the airport's capacity to handle aviation demand projected to occur during the next 20 to 25 years.

The plan considers the need for changes in capacity at the region's public-use airports and the approximate timing of needed airport improvements. Capacity is defined as the length and width of the airport's runway(s) necessary to handle the design aircraft. Air carriers choose the aircraft that are appropriate for their business. However, their choices are limited to those aircraft that can operate safely and efficiently within the dimensions and capability of the airport's runway(s) in the markets they serve.

Thus, the choice of aircraft must be made considering the airport's capability. Planners should evaluate and plan for airport capacity to better serve the community by taking into account aviation needs. Many airport runways currently are limited in length, accommodating only the smallest of aircraft. As a result, air carriers fly mostly 5- to 9-seater aircraft. The demand, though, continues to grow as communities grow and as the volume of fourth-class mail delivered by air under special provisions by the United States Postal Service (USPS) grows.

DOT/PF owns and operates 261 of the state's 284 public-use airports. In the Northwest region, DOT/PF owns and operates all but six of 48 public-use airports (Map 3-1). Virtually all of these 42 airports serve communities where there is no road connection to the rest of the state, making aviation the lifeblood of transportation in and out of those communities. Northwest Alaska residents fly about five times more per year than the average American does.

Demand for air travel depends 1) on the needs of residents for such things as visiting family and friends, business, health care, and education, and 2) on tourism. Since each of these is difficult to predict and since travel in the Northwest is impacted by vast distances over inhospitable wilderness, mountains and water, seasonal daylight, extreme cold, and high winds, the planner must rely on historical data to project future trends.

Alaska DOT/PF

Figure 3-1 Community of Gambell on St. Lawrence Island

Supply of air transportation to meet the demand must be developed in a manner that fits the travel patterns of the area and be based on the aircraft characteristics and air carriers' mode of operation in the area.

A new federal law will affect air transportation in the region. Taking effect in November 2003, Public Law 107-206 limits the number of air carriers in a market and calls for the air carriers to carry both passengers and mail on the same aircraft. Before November 2003, air carriers could fly only mail or only passengers on a given flight. Since most of the communities served by aviation have no roads connecting them to the rest of the state, the mail is the sole means by which goods and groceries are supplied to a community. By putting both mail and passengers on the same plane, the expectation is that the cost for transportation of both will be reduced.

The planning process first projects the future demand for both passengers and mail in the region and then sets forth a plan for airport capacity improvements to accommodate the aircraft needed to meet the demand. The plan is developed on a route-by-route basis.

3.1 Inventory of Air Transportation in Northwest Alaska

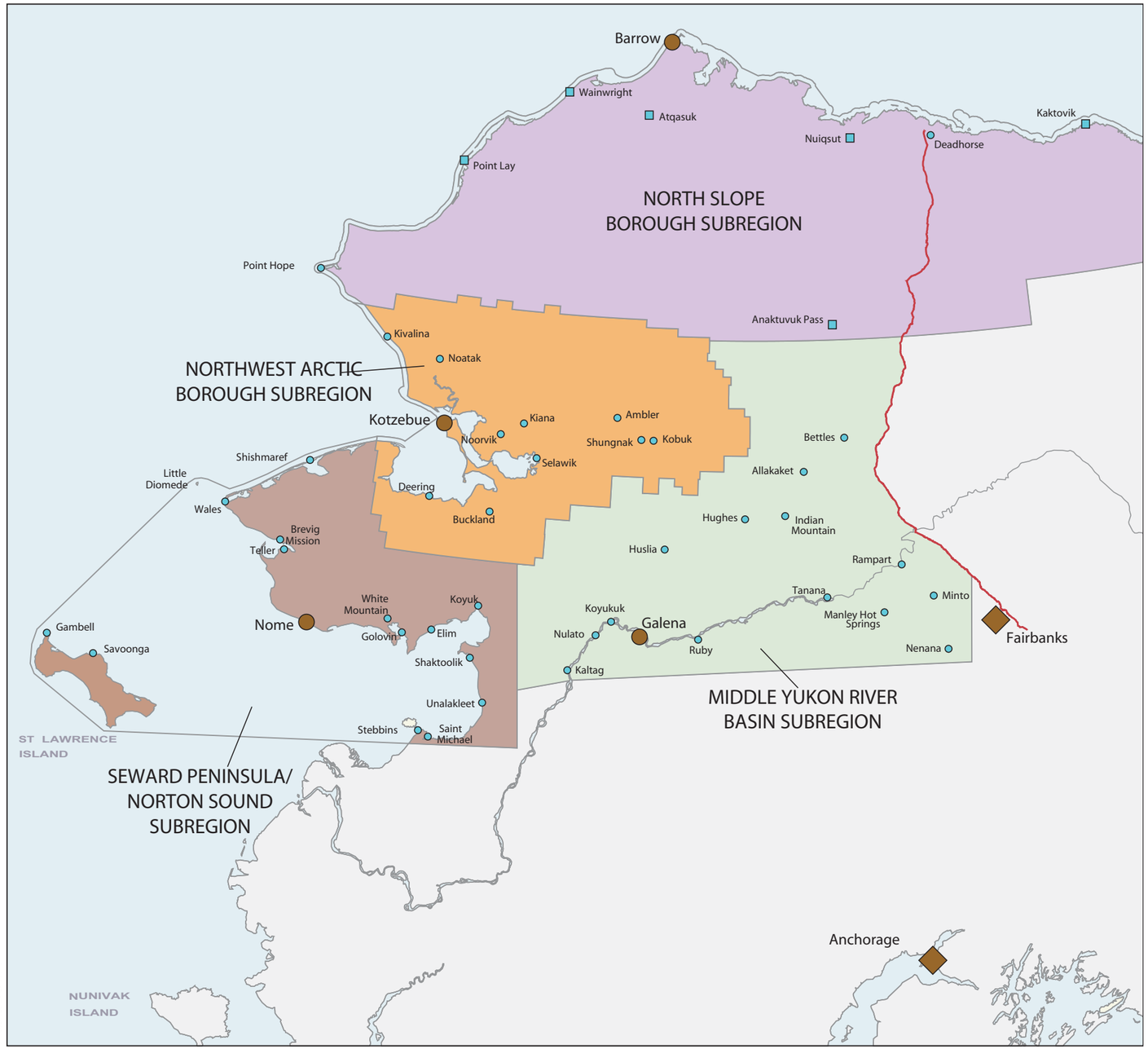
The goal is to understand the present Northwest aviation infrastructure and from that identify requirements for potential changes to that air transport system to increase safety, enhance mobility, and facilitate freight and mail movements. Improved air carrier productivity may be an added benefit. The plan first examines the air infrastructure that exists.

Map 3-1 shows the four subregions considered in this plan along with their airports:

- Northwest Arctic Borough Subregion
- North Slope Borough Subregion
- Middle Yukon River Basin Subregion
- Seward Peninsula/Norton Sound Subregion

3.1.1 Multiple Hubs

Air travel operations in the four subregions have developed such that not all communities in a given borough are served out of its hub community. For example, Point Hope in the North Slope Borough is served from Kotzebue (the hub for the Northwest Arctic Borough). The main service for Anaktuvuk Pass in the North Slope Borough is from Fairbanks, not from the hub at Barrow. Deadhorse is not included in the list of airports in the North Slope Borough in the table below although it serves to move mail to Kaktovik and to Nuiqsut. In addition, Unalakleet, while not a passenger hub, serves as a mail hub for Koyuk, Shaktoolik, Saint Michael, and Stebbins in the Seward Peninsula/Norton Sound subregion. Table 3-1 provides the subregions, hubs, and communities served by each hub.



Alaska DOT/PF

Map 3-1 Airports in Northwest Alaska Planning Area

Table 3-1 Subregions, Hubs, and Communities Served by Air in Northwest Alaska

Subregion	Subregion Hub	Number Served	Communities	
Northwest Arctic Borough	Kotzebue	11	Selawik Noorvik Noatak Buckland Kiana Point Hope	Kivalina Shungnak Deering Kobuk Ambler
North Slope Borough	Barrow	6	Anaktuvuk Pass Wainwright Nuiqsut	Atqasuk Point Lay Kaktovik
Middle Yukon River Basin	Galena	4	Nulato Kaltag	Ruby Koyukuk
	Fairbanks	9	Nenana Tanana Minto Allakaket Hughes	Manley Hot Springs Bettles Rampart Huslia
Seward Peninsula / Norton Sound	Nome	11	Gambell Savoonga Shishmaref Elim Brevig Mission Tin City	Teller White Mountain Wales Golovin Diomede (Inalik)
	Unalakleet	4	Stebbins Saint Michael	Koyuk Shaktoolik
Total	**5 plus Fairbanks**	**45**		

Table 3-2 provides an inventory of the community airports in the Northwest region by hub. In addition to the Federal Aviation Administration (FAA) identification for each airport, the inventory provides the distance to the hub, community population in 2000, primary runway length and width, adequacy of safety area for the primary runway, runway surface material, landing aids (airport approach lighting system), whether or not there is a shelter for passengers, and air carriers providing the major amount of scheduled passenger service to the community.

Alaska DOT/PF

Figure 3-2 Kotzebue Airport

Table 3-2 Inventory of Community Airports in Northwest Alaska (Page 1 of 2)

Communities Served from HUB	Airport ID (FAA)	Air Miles to HUB	Population 2000	Primary Runway Dimensions Length x Width	Safety Areas Adequate	Runway Surface Material	Landing Aids[a]	Shelter For Passengers[b]	Main Passenger Carriers[c]
Kotzebue HUB									
Kotzebue	OTZ	–	3,082	5,900 x 150	No	Asphalt	VASI, MIRL	Yes	AS, BER, CSY, HAG
Ambler	AFM	130	309	3,000 x 60	Yes	Gravel	VASI, MIRL	Yes	BER, CSY, HAG
Buckland	7K5	75	406	3,200 x 75	Yes	Gravel	VASI, MIRL	Yes	BER, CSY, HAG
Deering	DEE	56	136	2,600 x 50	No	Gravel	MIRL	No	BER, CSY, HAG
Kiana	IAN	59	388	3,400 x 100	Yes	Gravel	MIRL	Yes	BER, CSY, HAG
Kivalina	KVL	78	377	3,000 x 60	Yes	Gravel	MIRL	Yes	BER, CSY, HAG
Kobuk	OBU	156	109	2,360 x 58	No	Gravel	MIRL	No	BER, HAG
Noatak	WTK	48	428	4,000 x 60	Yes	Gravel	MIRL	Yes	BER, CSY, HAG
Noorvik	ORV	43	634	2,200 x 50	No	Gravel	MIRL	Yes	BER, CSY, HAG
Point Hope	PHO	150	757	4,400 x 75	No	Asphalt	VASI, MIRL	Yes	BER, CSY, HAG
Selawik	WLK	74	772	3,000 x 60	Yes	Gravel	VASI, MIRL	Yes	BER, CSY, HAG
Shungnak	SHG	148	256	4,000 x 60	Yes	Gravel	MIRL	Yes	BER, CSY, HAG
Barrow HUB									
Barrow	BRW	–	4,581	6,500 x 100	Need	Asphalt	HIRL, MALSR	Yes	AS, CSY, FFS, HAG
Anaktuvuk Pass	AKP	254	282	4,760 x 100	Yes	Gravel	MIRL	Yes	CSY, FFS
Atqasuk	ATK	59	228	4,370 x 110	Yes	Gravel	MIRL	Yes	CSY, FFS, HAG
Deadhorse	SCC	204	43	6,500 x 150	Yes	Asphalt	HIRL, MALSR	Yes	AS, CSY, FFS
Kaktovik	BTI	386	293	4,820 x 100	Yes	Gravel	VASI	No	CSY, FFS
Nuiqsut	AQT	151	433	4,343 x 100	Yes	Gravel	HIRL, MALSR	No	CSY, FFS
Point Lay	PIZ	180	247	3,519 x 80	Yes	Gravel	MIRL	No	CSY, FFS, HAG
Wainwright	AWI	87	546	4,000 x 75	Yes	Gravel	VASI, MIRL	No	CSY, FFS, HAG
Fairbanks HUB									
Fairbanks	FAI	–	–	–	–	–	–	–	–
Bettles	BTT	179	43	5,200 x 150	No	Gravel	MALSR, VASI	Yes	FFS, WAL, WAS
Allakaket	AET	163	133	4,000 x 80	No	Gravel	MIRL	No	FFS, WAL, WAS
Hughes	HUS	203	78	3,400 x 100	Yes	Gravel	MIRL	No	WAL, 3K
Huslia	HSL	255	293	3,000 x 60	No	Gravel	MIRL	Yes	FFS, WAL
Manley Hot Springs	MLY	83	72	2,875 x 30	No	Gravel	VFR	No	3K, TAN, WAL
Minto	51Z	50	258	2,000 x 65	No	Gravel	VFR	No	TAN
Nenana	ENN	41	402	5,000 x 100	Yes	Asphalt	VASI, MIRL	No	None
Rampart	RMP	82	45	3,500 x 75	Yes	Gravel	MIRL	No	WAL
Tanana	TAL	127	308	4,400 x 100	No	Gravel	VASI, MIRL	No	FFS, WAL

Table 3-2 Inventory of Community Airports in Northwest Alaska (Page 2 of 2)

Communities Served from HUB	Airport ID (FAA)	Air Miles to HUB	Population 2000	Primary Runway Dimensions Length x Width	Safety Areas Adequate	Runway Surface Material	Landing Aids[a]	Shelter For Passengers[b]	Main Passenger Carriers[c]
Galena HUB		**(FAI)**							
Galena	GAL	– (268)	675	7,254 x 100	Yes	Asphalt	VASI, ALSF	Yes	FFS, WAL, LFS, TAN
Kaltag	KAL	61 (325)	230	5,000 x 100	Yes	Gravel	MIRL	No	FFS, WAL
Koyukuk	KYU	25 (290)	101	3,000 x 60	Yes	Gravel	MIRL	No	LFS, FFS
Nulato	NUL	34 (302)	336	3,000 x 100	Yes	Gravel	MIRL	Yes	FFS, WAL
Ruby	RBY	44 (225)	188	4,000 x 100	Yes	Gravel	MIRL	No	LFS, FFS, TAN
Nome HUB									
Nome	OME	–	3,505	6,000 x 150	Yes	Asphalt	VASI, HIRL, MALSR	Yes	AS, BER, CSY, HAG
Brevig Mission	KTS	64	276	3,000 x 100	Yes	Gravel	MIRL	No	BER, CSY, HAG
Diomede (Inalik)	LDD	134	146	Heliport	N/A	Concrete	MIRL	No	BER, CSY, HAG
Elim City	ELI	95	313	3,000 x 60	Yes	Gravel	MIRL	Yes	BER, CSY, HAG
Gambell	GAM	197	649	4,500 x 100	Yes	Asphalt	VASI, MIRL	Yes	BER, CSY, GRT, HAG
Golovin	N93	72	144	4,000 x 75	Yes	Gravel	MIRL	No	BER, CSY, HAG
Port Clarence	KPC	66	21	4,500 x 120	N/A	Asphalt	MIRL	No	BER, CSY, HAG
Savoonga	SVA	162	643	4,402 x 100	Yes	Gravel	MIRL	Yes	BER, CSY, GRT, HAG
Shishmaref	SHH	122	562	5,600 x 70	Yes	Asphalt	VASI, MIRL	No	BER, CSY, HAG
Teller	AK54	59	268	3,000 x 60	Yes	Gravel	MIRL	No	BER, CSY, HAG
Tin City	TNC	103	–	4,700 x 135	N/A	Gravel	VASI	No	BER, CSY, HAG
Wales	IWK	109	152	4,000 x 75	Yes	Gravel	MIRL	No	BER, CSY, HAG
White Mountain	WMO	62	203	3,000 x 60	Yes	Gravel	MIRL	No	BER, CSY, HAG
Unalakleet HUB		**(Nome)**							
Unalakleet	UNK	– (147)	747	6,004 x 150	No	Gravel	VASI, MIRL MALSR	Yes	BER, CSY, HAG, PNA
Koyuk	KKA	74 (130)	297	3,000 x 60	Yes	Gravel	MIRL	Yes	BER, CSY, HAG
Stebbins	WBB	52 (118)	547	3,000 x 60	Yes	Gravel	MIRL	Yes	BER, CSY, HAG
Saint Michael	5S8	47 (126)	368	4,000 x 75	Yes	Gravel	MIRL	Yes	BER, CSY, HAG
Shaktoolik	38A	32 (129)	230	4,000 x 75	Yes	Gravel	MIRL	No	BER, CSY, HAG,

a. Landing Aids (Airport lighting systems for landing):

ALSF	High-Intensity Approach Light System	MALSR	Medium-Intensity Approach Light System
HIRL	High-Intensity Runway Lights	VASI	Visual Approach Slope Indicator
MIRL	Medium-Intensity Runway Lights	VFR	Visual Flight Rules only

b. Federal Aviation Administration, *Alaskan Regional Airport Plan,* 2000

c. Main Passenger Air Carriers:

3K	Air Cargo Express (Tatonduk Outfitters Ltd.)	HAG	Hageland Aviation Services
AS	Alaska Airlines	LFS	Larry's Flying Service
BER	Bering Air	PNA	Peninsula Air (one route only)
CSY	Cape Smythe Air Service	TAN	Tanana Air Service
FFS	Frontier Flying Service	WAL	Warbelow's Air Ventures
GRT	Grant Aviation	WAS	Wright Air Service

3.1.2 Air Carrier Regular Routes

The Official Airline Guide (OAG) publishes the schedules of passenger carriers and the communities they serve. The OAG shows that most air carriers compete over the same or very similar sets of routes. Our analysis will use the 17 main routes displayed in Figure 3-3 and listed in Table 3-3. There are several instances in which an air carrier serves communities that are on two routes. However, these 17 routes accommodate 90 to 95 percent of the traveling public and cargo in Northwest Alaska.

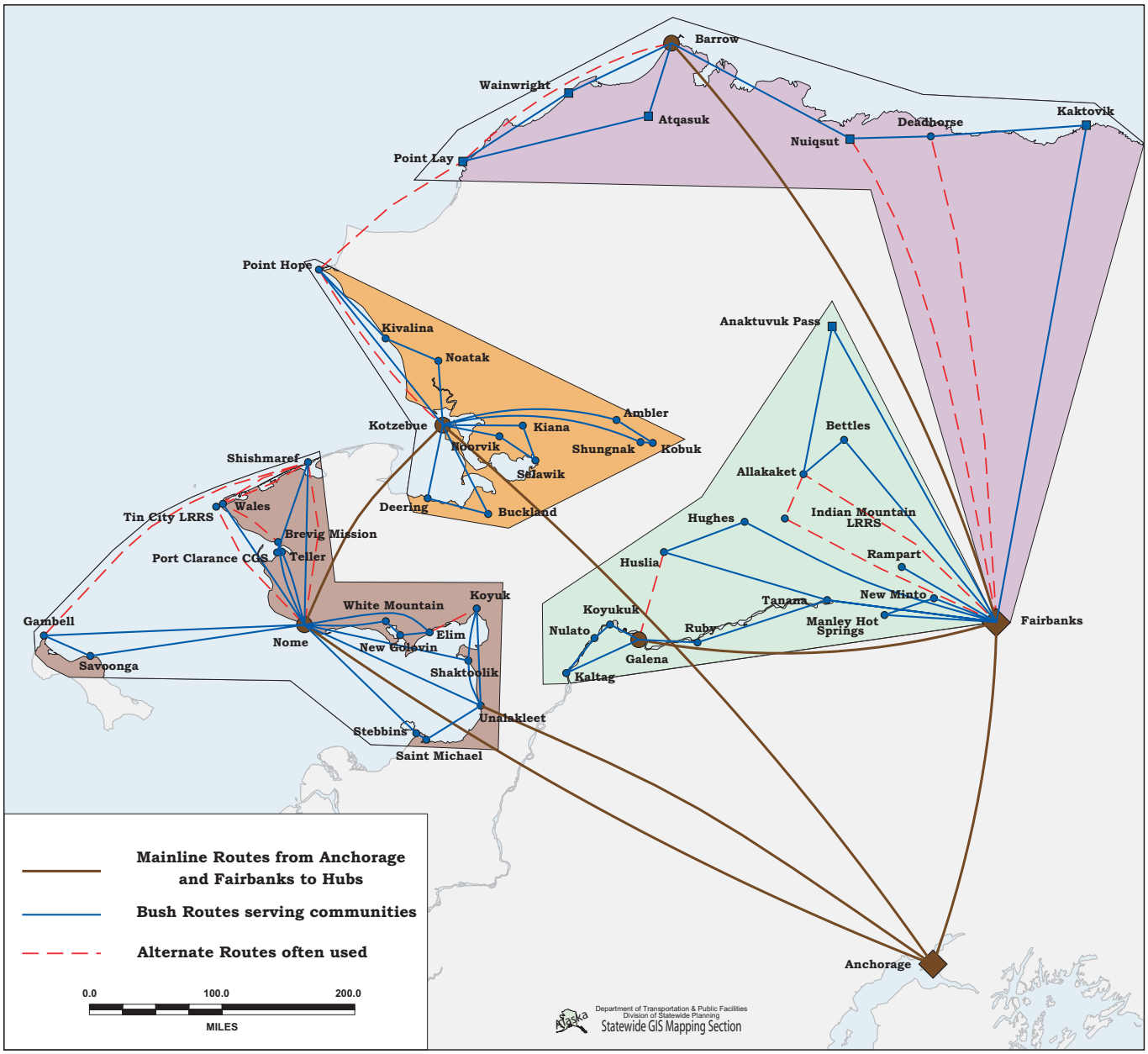


Figure 3-3 Northwest Alaska Air Carrier Route Structure

Table 3-3 Main Air Carrier Routes in Northwest Alaska

Route	Communities Served	Round Trip Distance in Miles
1	Kotzebue to Ambler to Kobuk to Shungnak	315
2	Kotzebue to Buckland to Deering	177
3	Kotzebue to Kiana to Noorvik to Selawik	164
4	Kotzebue to Noatak to Kivalina to Point Hope	331
5	Barrow to Wainwright to Point Lay to Atqasuk	381
6	Barrow to Nuiqsut (to Deadhorse) to Kaktovik or Fairbanks to Kaktovik	638 or 762
7	Fairbanks to Anaktuvuk Pass to Bettles to Allakaket	568
8	Fairbanks to Hughes to Huslia to Fairbanks	521
9a	Fairbanks to Manley Hot Springs to Minto	172
9b	Fairbanks to Rampart	164
10	Fairbanks to Galena to Ruby to Tanana	542
11	Galena to Koyukuk to Nulato to Kaltag	135
12	Nome to Shishmaref to Wales	292
13	Nome to Savoonga to Gambell	400
14	Nome to Brevig Mission to Teller	128
15	Nome to White Mountain to Golovin to Elim (to Koyuk sometimes)	195
16	Nome to Unalakleet to Shaktoolik to Koyuk	393
17	Nome to Unalakleet to Saint Michael to Stebbins	325

3.1.3 Conditions Affecting Airport Layout and Aircraft Choice

Conditions in Northwest Alaska affecting airport layout and aircraft choice include the isolated location of communities, weather and winds, long distances, hazardous terrain, and lack of daylight in winter. Extreme weather conditions and rugged terrain in Northwest Alaska make flying difficult and often hazardous. Long distances between communities mean that aircraft must carry more fuel than on shorter routes, resulting in reduced payload per aircraft. Flights over mountainous terrain and water make a two-engine airplane best in terms of safety and passenger confidence, with the result that the twin engine Piper Navajo is widely used, especially by those carriers that have a large share of the market.

Frequent 30- to 40-knot crosswinds occur in some areas, especially along the coast, resulting in the need for wider runways and crosswind runways to improve safety on take-off and landing. Lack of daylight in the winter months makes landing aids and runway lights essential for maintaining air carrier service.

Some communities are very isolated; some are located on shallow rivers. Barge delivery of fuel in the short river season is difficult and expensive, resulting in the need to fly fuel in. To keep fuel delivery costs down, airports serving these

communities need to be able to accommodate DC-6 fuel carriers on an occasional basis.

Routes between two or three communities served on the same flight are scheduled and reported in the OAG. The ability of any air carrier to fly both passengers and mail on the same plane on any route will depend on the service limitation (usually runway length) of the most constraining airport.

3.1.4 Aircraft Being Used at Present

Table 3-4 lists the aircraft used in the area. Single engine aircraft is mostly used to transport mail or small passenger loads (one to five passengers). The twin engine Piper Navajo (Piper 31) and the single engine Cessna Caravan 208 are used for passenger service by larger carriers.

Due to the unique conditions in this region discussed above, air carriers in Northwest Alaska use many twin-engine aircraft. The effort by the carriers to keep aging aircraft like the Navajo operating suggests that the Piper Navajo will likely make up the majority of operations for the next ten years. Clearly the data indicate that the Navajo and Cessna 206, 207, and 208 Caravan are the workhorses. Figure 3-4 shows the Piper Navajo.

Figure 3-4 Piper Navajo

3.1.5 The Movement of Mail in Rural Alaska

The air transportation system not only moves people throughout the region but it also serves as the equivalent of the "wholesale-to-retail" distribution system for groceries and other consumer goods. In other parts of the country, trucks and other surface transportation modes provide goods movement.

Table 3-4 Air Carrier Aircraft in Use in Northwest Alaska with Market Share in 2002

Air Carrier	Market Share 2002	Single Engine			Twin Engine				
		Cessna 206, 207, etc.	Cessna Caravan (208)	Piper and Other	Piper Navajo and Other	Cessna Caravan II (F406)	King Air	Other Twin	Beech 1900
Bering Air	41%	3	4	0	6		2		0
Hageland Aviation Services	15%	17	4		0	2		3	2
Frontier Flying Services	14%	2	0	1	7		1	2	3
Warbelow's Air Ventures	10%	3		1	10				
Cape Smythe Air Service	9%	8		1	6		2		
Wright Air Service	6%	4	3	1	4				
Larry's Flying Service	2%	4	6	5	6			1	
Total		**41**	**17**	**9**	**39**	**2**	**5**	**6**	**5**

The mail moves under a special provision in federal law that permits and subsidizes air delivery of fourth-class mail to remote Alaska. Rates are about 20-40 percent of private air cargo rates. At one time, stores received some goods by airfreight but most arrived on barge with one or two deliveries per year.

Today the stores in Northwest Alaska depend almost entirely on the fourth-class mail system with packages delivered by air. Items not permitted through the mail, such as bleach and chemicals, arrive by air cargo. The weight of air cargo varies from community to community and from week to week but averages about 14 percent of the weight of the mail.

Mail delivery as a part of retail distribution continues to grow throughout Alaska. Mainline routes that move goods from shippers in Anchorage and Fairbanks to the designated regional hubs around the state grew from 90.5 million pounds in 1986 to 201.6 million pounds in 2002 (an average growth rate of about 5 percent per year). The volume to non-hub communities grew from 36.4 million pounds in 1986 to 60 million pounds in 1997 and an estimated 100 million pounds in 2002. Estimates are that the demand for mail delivery, particularly of fourth-class mail, will continue to grow in remote Alaska as populations grow and communities transition to a more diverse cash economy.

Heavy goods, including construction materials and large consumer items (e.g., snowmachines), and hazardous goods will continue to come by barge as common freight in the summer and/or by regular air cargo service throughout the year. The remainder, usually personal orders, go through the normal USPS system as regular mail — some as priority mail and some as non-priority mail.

Alaska DOT/PF

Figure 3-5 Bypass Mail in Anchorage

Soon after aviation-based fourth-class mail service to rural Alaska started, mail volumes began to overwhelm postal facilities in Anchorage. In 1985, the USPS instituted the bypass mail system, in which mail moves directly from certified distributors to communities without going through the Post Office. Instead, after the distributor fills an order exceeding 1,000 pounds, stamps it as though it were fourth-class mail and puts it on a pallet designated for a community, it is taken to the air carrier. A postal inspector meets the shipper at the air carrier and transfers the mail shipment to the air carrier. From there, it is the air carrier's responsibility to deliver the mail to the recipient in the community. The USPS stipulates that the mail must be delivered from the hub to outlying communities within one day of receipt at a hub. By routing these millions of pounds of mail directly to the air carrier rather than through the Post Office facility, a major stress on the Post Office was eliminated, dramatically improving USPS efficiency, and resulting in the name

"bypass" mail. Currently about 75 percent of fourth-class mail to remote Alaska goes by bypass mail.

The other 25 percent of fourth-class mail, often packages of less than 1,000 pounds, moves through the usual Post Office process as non-priority mail, travels on regularly scheduled passenger aircraft to the hubs where it is moved to the air carrier who delivers it together with the bypass mail. Since bypass mail service began in the 1980s, mail volumes have increased threefold. During the same time, passenger traffic on these flights has more than doubled.

Between 500,000 and 2 million pounds of mail are delivered to each community each year. Mail volume to the community averages about one ton per resident per year. The ease of ordering, the considerably lower cost compared to air freight rates, the quick shipment coupled with lowered inventory costs at the store, and ease of working with individual shippers contributed to the rapid increase in bypass mail volumes.

Alaska DOT/PF

Figure 3-6 Delivery of Bypass Mail to Gambell on St. Lawrence Island

Delivery of mail by air at fourth-class rates has permitted a better flow of goods into the region's communities. It also supports an affordable and reliable air passenger service since air carriers that haul mail also haul passengers. This has improved opportunities of residents to travel by air for business, medical care, and education as well as for visiting family and friends in other communities.

In the late 1990s, insurance costs for small passenger aircraft in Alaska increased dramatically. As a result, several small air carriers stopped providing passenger service. However, they continued to carry their equitable share of mail. In fact, without a passenger schedule commitment, many carriers were then free to compete on any mail route market they felt would be profitable. In many markets, where five or six carriers previously had been providing passenger/mail service, there were now as few as three carriers providing passenger/mail service and as many as eight to ten other carriers providing mail-only service, carrying the mail formerly carried by the passenger carriers. Mail-only carriers received substantial increases in profit by hauling mail without the higher costs for handling passengers. Associated with this change were inefficiencies that resulted in higher mail rates, higher passenger fares, and reduced revenues to passenger/mail carriers. Because of the increased number of carriers, mail would often sit in air carrier warehouses accumulating a volume sufficient to warrant operation. Some carriers just left the mail (including groceries and consumer goods) on the tarmac where items were damaged. The

significant increase in spoiled and damaged mail raised prices for consumer goods and items in community stores.

The U.S. Department of Transportation is responsible for establishing rates paid by the USPS to air carriers to cover the costs of mail delivery. These "compensatory rates" for both mainline and bush are significantly higher than the fourth-class postal rates paid by the user, but reflect a historical commitment by the USPS to provide mail services to all regions of the nation. In 2002, mail delivery throughout the state of Alaska cost USPS about $140,000,000 (70 cents per pound). The USPS receives in fourth-class postage only a fraction (estimated to be about one-tenth) of that cost.

3.1.6 Shelters

Because the weather in Northwest Alaska is often cold and windy with long winters, airport shelters are desirable. Airports in hub communities have shelters or a terminal building that are often provided by the carrier that services the area. Rural airports are now being constructed further away from communities to allow for longer runways and community growth. Most small airports do not offer shelters for outgoing passengers waiting for planes or incoming passengers waiting for transportation into the community. Because relatively few residents possess automobiles in which to wait for an airplane, airport shelters offer much needed safety and refuge from the weather, particularly in winter.

Many communities have requested shelters be built at their airports. Several villages in Northwest Alaska have had airport shelters at one time. Vandalism and lack of maintenance has been an issue; some are no longer usable. Shelter projects are eligible for Airport Improvement Program funds if the community has over 2,500 annual enplanements and is a commercial service airport, and the city or village government agrees to assume ownership and maintenance of the facility. Airport leases at no cost are also available to eligible shelter sponsors.

The shelter list appears on the inventory in Table 3-2. Figure 3-7 shows two representative shelters.

Alaska DOT/PF

Alaska DOT/PF

Figure 3-7 Airport Shelters
Above, the shelter at Stebbins airport. Right, the shelter at Koyuk airport.

3.2 Demand for Air Travel in Northwest Alaska to 2025

The demand for air travel in Northwest Alaska for the next 25 years is a function of two things — passenger travel and the volume of mail delivery. The key determinants for estimating passenger travel are projected population and selected economic data. Per capita income by census area is the primary economic indicator used; these income data unfortunately do not include the effective value of income due to subsistence activities by residents. For the estimate of mail volume, all the mail — first class (six percent), fourth class (23 percent) and bypass (71 percent) — is treated as one. Past analyses have shown this to be a reasonable assumption.

Figure 3-8 shows the steps involved in developing the forecasts. The data needed is also suggested. Left of the line is historical data. Each step in the forecasting process will be addressed in turn.

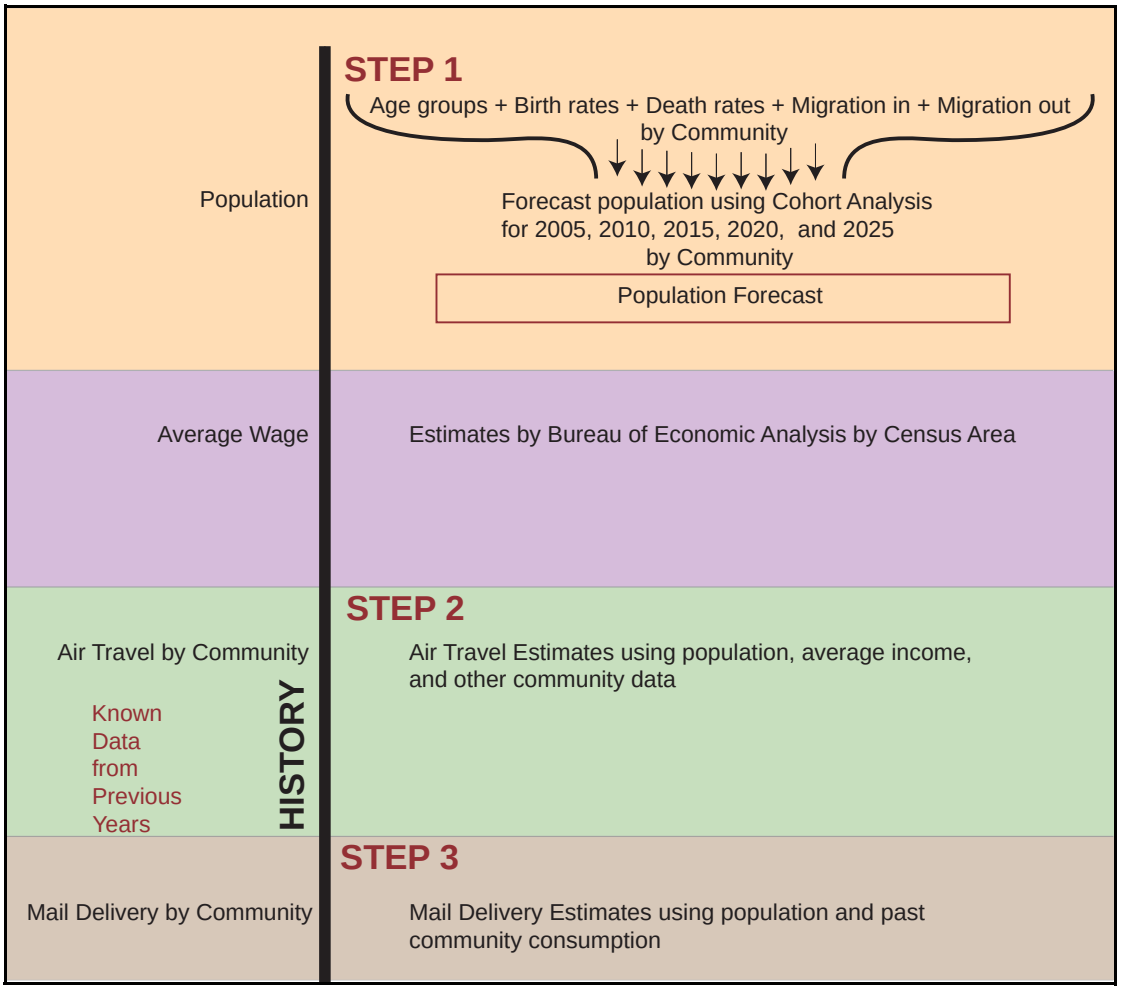


Figure 3-8 Aviation Forecasting Process for Northwest Alaska

3.2.1 STEP 1 Population Forecast

Forecasts were prepared for each community using five-year cohorts[3] and recent birth and death rates. In- and out-migration was established based on examining the actual versus forecast methods using the one ten-year period 1990 to 2000 where the benchmark census data exist.

Alaska DOT/PF

Figure 3-9 Shishmaref Airport

The DOT/PF population forecast for 2025 used as a basis for the analysis in this and other chapters assumes an overall average growth rate in the region of 1.27 percent. This rate was compared to the population growth rates prepared by the Alaska Department of Labor and Workforce Development (DOL). Although the periods are different, there is not a significant difference in the overall growth rates between DOL's 20-year mid-level forecast (1.36%) and the 25-year forecast made in this analysis (1.27%). Based upon a 1.27 percent growth rate, the population in the region will grow from 26,275 in 2000 to about 36,000 in 2025.

Population within each subregion is projected to increase on average each year through 2025 as follows:

- Northwest Arctic Borough Subregion 1.96%
- North Slope Borough Subregion 1.16%
- Middle Yukon River Basin Subregion 0.73%
- Seward Peninsula/Norton Sound Subregion 1.58%

3.2.2 STEP 2 Forecast of Air Travel

The forecast for air travel is determined by examining the enplanements or aircraft boardings at each airport. The history for the region is shown in Figure 3-10 and Table 3-5. As can be seen, the number of enplanements, in both the hubs and communities, has been flat since the mid-1990s.

The enplanement forecast (Figure 3-11 and Table 3-5) is based on the history of flights in and out of each community and changes in factors such as population, income, enplanements per person, and the presence of a road connection.

3. A cohort is a group of people of approximately the same age.

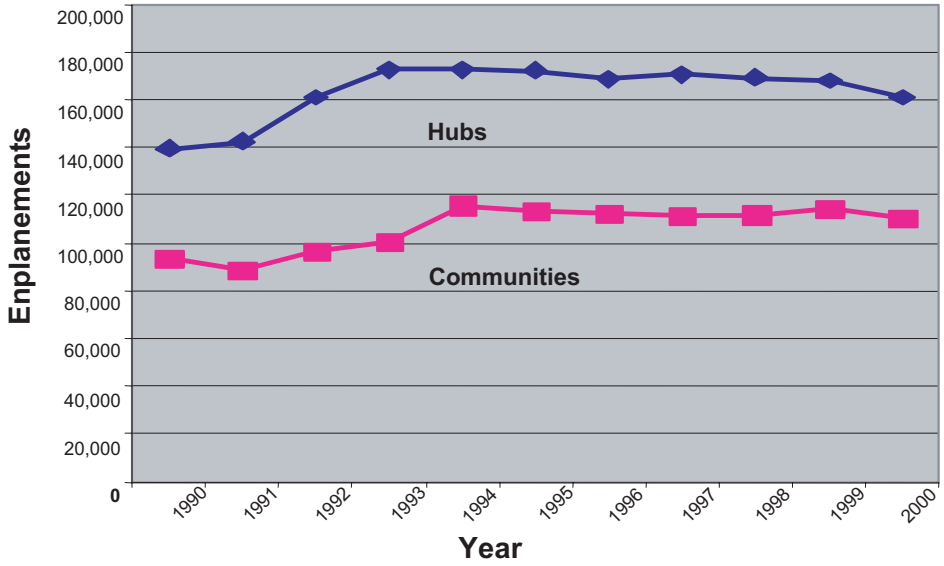


Figure 3-10 Enplanements in Northwest Alaska, 1990 – 2000

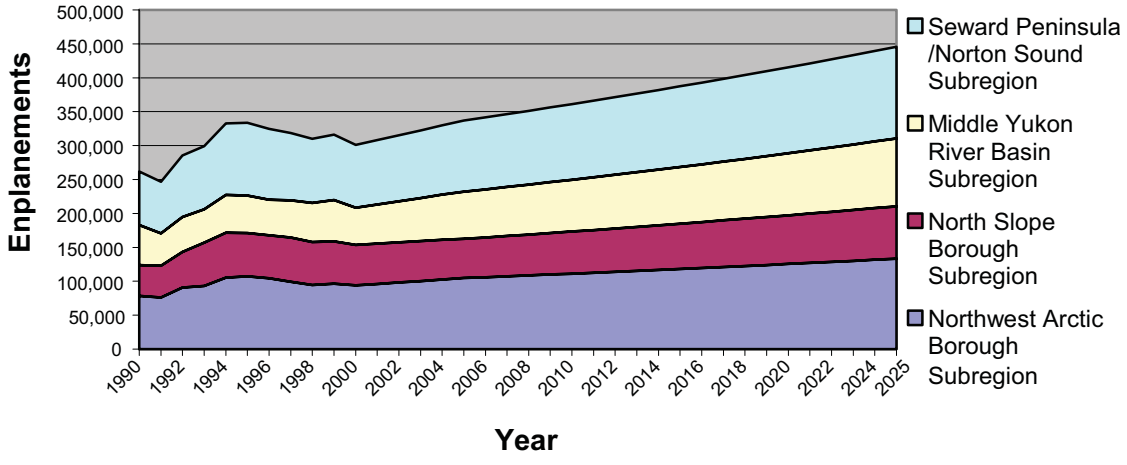


Figure 3-11 Enplanement Forecast for Northwest Alaska by Subregion

Table 3-5 Enplanement History and Forecast for Hubs and Communities by Subregion

Subregion	1990	1995	2000	2005	2010	2015	2020	2025
Northwest Arctic Borough Subregion								
Communities in Subregion	29,536	33,682	35,977	40,857	44,403	48,047	51,320	54,179
Kotzebue	53,765	58,127	58,112	63,935	67,821	71,913	75,633	78,924
Northwest Arctic Borough	83,301	91,809	94,089	104,792	112,224	119,960	126,953	133,103
North Slope Borough Subregion								
Communities in Subregion	9,423	12,334	13,151	16,284	18,044	19,609	21,263	22,803
Barrow	29,699	42,918	38,880	41,305	44,544	47,680	50,998	54,301
North Slope Borough	39,122	55,252	52,031	57,589	62,588	67,289	72,261	77,104
Middle Yukon River Basin Subregion								
Communities in Subregion	35,156	33,669	32,824	34,683	39,072	43,495	45,954	49,273
Galena	9,888	7,260	9,089	9,799	11,342	12,608	13,815	14,957
Fairbanks for the Region	21,821	24,578	23,962	25,319	28,523	31,751	33,546	35,969
Middle Yukon River Basin	66,865	65,507	65,875	69,801	78,937	87,854	93,315	100,199
Seward Peninsula/Norton Sound Subregion								
Communities in Subregion	24,443	33,626	29,293	34,063	36,603	39,126	41,648	44,176
Nome	47,191	62,280	55,145	61,551	65,791	70,228	74,665	79,039
Unalakleet	7,344	9,207	8,413	9,197	9,831	10494	11,157	11810
Seward Peninsula / Norton Sound	78,978	105,113	92,851	104,811	112,225	119,848	127,470	135,026
Northwest Region								
Communities in Region	98,558	113,311	111,245	125,887	138,122	150,277	160,185	170,431
Hubs (not including Fairbanks)	169,708	204,370	193,601	211,106	227,852	244,674	259,814	275,000
Northwest Region Total	268,266	317,681	304,846	336,993	365,974	394,951	419,999	445,431
Population	23,190	25,174	26,630	28,672	30,930	33,302	35,654	37,971
Enplanements per person per year	11.6	12.6	11.4	11.8	11.8	11.9	11.8	11.7

3.2.3 STEP 3 Forecast of Mail

The USPS fourth-class (non-priority) mail service delivers between 300,000 to over 1 million pounds of mail to each community each year. The large volume of mail produces a significant demand on air service. In fact, it is about the same as the demand of passenger service.

The forecast for fourth-class mail for Northwest Alaska is derived from past mail levels per person in the community, projected population growth, and an estimate of 5 to 10 pounds of mail increase per person per year, based on historical growth. Mail volume by community averages nearly 2,000 pounds per person per year. The volume in the hubs is about 25% higher than that in the communities.

As shown in Table 3-6, there are almost 60 million pounds of mail being delivered annually to the Northwest region. Almost half of the mail coming to the region's six hubs is then trans-shipped by bush aircraft to their satellite communities.

According to Table 3-6, the per-capita mail volume is about 2,042 pounds per person in the outlying communities, a little less than in the hubs. The table reveals that the volume of mail per person varies by subregion.

Using past data, a community mail demand model was created. Those communities that have road or river connection to Alaska's Parks Highway—Manley Hot Springs, Minto and Nenana—have had sporadic mail delivery by air in the past years, so projections for these communities were excluded. The mail demand for the seven hub communities was estimated by trend extrapolation, since no useful linear regression model could reproduce the mail demand for 1995 to 2000 for these communities.

Based on mail volume in 1995 and 2000, Table 3-7 provides the mail demand forecasts for Northwest Alaska in five-year increments from 2005 through 2025 by subregion and by totals for hubs and communities.

Table 3-6 Mail Volume and Population for Northwest Alaska in 2000

	Hub Data			Non-Hub Data		
Subregions and Hubs	**Mail Delivered from Anchorage or Fairbanks to Hubs (lbs)**	**Subregion Population**	**Per Capita Mail Volume in Hubs (lbs)**	**Mail Delivered from Hubs to Non-hub Communities (lbs)**	**Subregion Non-hub Population**	**Per Capita Mail Volume in Non-hub Communities (lbs)**
Northwest Arctic Borough						
Kotzebue	16,173,600			9,052,529		
Northwest Arctic Total	16,173,600	7,208	2,244	9,052,529	4,126	2,937
North Slope Borough						
Barrow	14,952,900			4,076,100		
Deadhorse	575,700			575,700		
North Slope Total	15,528,600	7,385	2,108	4,651,800	2,761	1,006
Middle Yukon River Basin						
Fairbanks	1,856,000			1,856,000		
Galena	3,417,000			1,785,000		
Middle Yukon River Basin Total	5,273,000	3,350	1,574	3,641,000	2,675	1,361
Seward Peninsula/Norton Sound						
Nome	17,291,300			9,252,500		
Unalakleet	4,935,000			3,029,200		
Seward Peninsula/ Norton Sound Total	22,226,300	9,196	2,417	12,281,700	4,944	2,484
Northwest Region						
Total	**59,201,500**	**27,139**	**2,181**	**29,627,029**	**14,506**	**2,042**

Total mail demand in Northwest Alaska will likely reach nearly 84 million pounds by 2025. This represents an average annual growth rate of 1.4 percent since 1995, a little higher than the actual annual growth of mail in the last six years (1.2 percent). Per capita mail demand is expected to grow slightly to nearly 2,400 pounds per person in 2025 if the USPS operation and route structure does not change. This represents a growing demand of about five pounds per person per year. The model results indicate the mail demand in Northwest Alaska is growing at a slightly faster pace than the population. Figure 3-12 compares the modeled demand with trend projections.

Table 3-7 Historic and Projected Mail Delivery in Northwest Alaska, 1995 – 2025 (Pounds)

	1995[a]	2000[a]	2005	2010	2015	2020	2025
Northwest Arctic Borough	8,080,113	9,052,529	9,781,060	10,708,353	11,664,520	12,180,296	12,796,802
North Slope Borough	3,677,500	4,076,100	3,813,790	4,360,730	4,927,680	5,433,730	5,883,230
Middle Yukon River Basin	3,503,000	3,641,000	3,807,000	3,969,000	4,127,000	4,252,000	4,353,000
Seward Peninsula / Norton Sound	9,252,500	12,818,300	13,159,000	13,936,000	14,770,100	15,612,800	16,445,100
Total for Communities	24,513,113	29,587,929	30,560,850	32,974,083	35,489,300	37,478,826	39,478,132
Total for Hubs	32,043,587	29,613,571	33,164,981	35,378,294	37,973,969	41,042,657	43,867,768
Total for Northwest AK	**56,556,700**	**59,201,500**	**63,725,831**	**68,352,377**	**73,463,269**	**78,521,483**	**83,345,900**

a. Actual USPS figures for mail volume in 1995 and 2000. Population projections were used in calculating mail volume forecasts for 2005 through 2025.

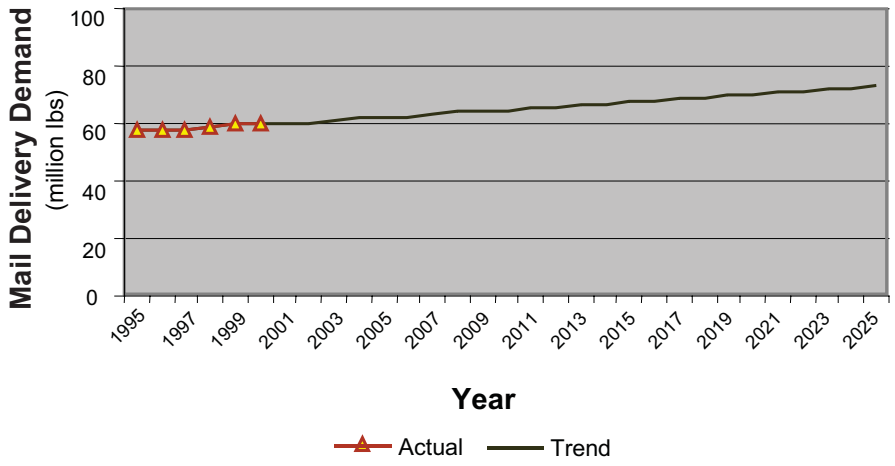


Figure 3-12 Mail Delivery Demand Trend and Projection for Northwest Alaska

3.3 Supplying Transportation to Meet Demand

The plan will identify airport improvements needed to accommodate aircraft that are likely to be used in Northwest Alaska to meet future demand. This section first evaluates three facets of air transportation supply, then establishes and uses a planning analysis tool to evaluate the capacity of airports on each route in the Northwest. The three facets are:

- The aircraft the private sector will likely use to transport passengers and mail.
- Airport capacity (runway length and width) needed to handle the aircraft chosen by the air carriers.
- When the needed airport improvements will likely occur.

On August 2, 2002, the President signed into law Public Law 107-206. Title III Section 3002 is entitled "The Rural Service Improvement Act of 2002." This law has far-reaching impacts on Alaska's air transportation system as it sets out a new operating approach for moving mail and people in rural Alaska. Air carriers must develop a system to provide joint carriage of passengers and mail on their regularly scheduled air service. This aviation analysis takes a systematic look at that requirement and what it likely means for airports.

While the new law calls on the USPS to change how they tender (contract out) the mail to air carriers for delivery, it requires changes in management and planning by all participants in Alaska aviation:

- U.S. Postal Service is responsible for implementing the new law.
- Federal Aviation Administration (FAA) provides oversight of carriers and approves funds for airport improvement.
- Bureau of Transportation Statistics maintains the database used for management.
- Secretary of the U.S. Department of Transportation develops rates to compensate the air carriers for mail transport.
- Rural airport owners and operators in Alaska must adjust airport capability to meet the needs of the new law. There are 48 public-use airports in Northwest Alaska; six of these are owned by the North Slope Borough, and the remainder are owned and operated by DOT/PF.
- Private air carriers must obtain the aircraft and fly the schedules necessary to carry both passengers and mail as required.

3.3.1 Aircraft Capacity and Service under the New Legislation

In Section 3.1, the route structure was discussed and the present fleet of aircraft flying those routes presented. Generally, if a route is adequately served now by operating five daily flights of a Cessna 207 carrying five to seven passengers at an average load factor of 60 percent, the law will call for increasing the payload capability to add nearly the same amount of weight in mail. To achieve this, the air carrier must either fly the route more often or use a larger aircraft.

The legislation requires that air service be upgraded in a given market as appropriate from air service governed by Part 135[4] of the Federal Air Regulations (FAR) to FAR Part 121[5] service. Table 3-8 defines these two types of service.

Alaska DOT/PF

Figure 3-13 Cessna 207

Planning analysis will determine for each air route at what point the combined passenger and mail load requires that air carriers shift to twin engine / two-pilot aircraft. The new law suggests the need to review runway dimensions, especially length, at community airports since larger aircraft generally require longer runways. Instead of using a Cessna Caravan 208 as the design aircraft for many remote community airports, these airports may need to be designed to handle aircraft with a 19-passenger capacity such as the Beech 1900 or Fairchild Metro, or with a 13- to 15-passenger capacity such as the Beech King Air, Beech 99C, or Beech 1300.

3.3.2 Impacts on Airport Design

FAR Part 135 air routes are so designated because they serve smaller communities or communities close to a major hub. Aircraft suitable for these routes include several nine-passenger aircraft that can operate on a runway of 3,400 feet or less. The state minimum standard runway length of 3,400 feet, established several years ago, ensures that 95 percent of aircraft operating with fewer than ten passengers can safely land and take off at these airports at 1,000 feet elevation or less and at Alaska temperatures.

Table 3-8 Major Differences between FAR Part 135 and FAR Part 121 Air Service

	FAR Part 135[a]	FAR Part 121[b]
Number of Passengers	Fewer than ten	Ten or more
Number of pilots	1	2
Weather radar	Not required	Required
Flight recorders	Not required	Required
Collision Avoidance	Not required	Required
Maintenance	Regular	Upgraded
Training	Minimum Level	Much Higher

a. FAR Part 135 Federal Aviation Regulations, Part 135 Certification and Operations, Domestic Flag and Supplemental Air Carriers and Commercial Operators of Small Aircraft.
b. FAR Part 121 Federal Aviation Regulations, Part 121 Certification and Operations, Domestic Flag and Supplemental Air Carriers and Commercial Operators of Large Aircraft.

4. FAR Part 135: a class of service with fewer than ten passengers piloted with a single pilot.
5. FAR Part 121: a class of service with ten or more passengers requiring two pilots.

Northwest Alaska, with its long distances, rugged terrain, water routes, and temperatures often at minus 20°C or below, calls for the use of twin-engine aircraft. One carrier flies the Beech C99 as a FAR Part 135 aircraft, limiting the 15-passenger aircraft to only nine passengers and using two pilots.

Table 3-9 presents the aircraft mix serving Northwest Alaska with FAR Part 135 service in January 2003. The Cessna Caravan 208 single-engine aircraft and the Piper Navajo twin-engine aircraft fly the most air miles by far. Airports in this region should be able to accommodate the most demanding of those two aircraft (Piper Navajo). Airports in the region with runways too short to accommodate a fully loaded Piper Navajo on takeoff should be carefully studied with a view to lengthening the runway. Experienced Piper Navajo pilots maintain that runways of 3,700 feet in length are needed even when the temperature and elevation are low, due to snow and icy conditions.

Table 3-9 shows that the Piper Navajo and Cessna Caravan II (F406), both twin engines, and the Cessna Caravan 208, a single engine aircraft, are the workhorses of the fleet. About 65 percent of passenger-miles are on twin engines. Twin-engine aircraft are used for longer-range travel.

Based on data from the six most-used air carriers in the region, these data represent over 92% of passenger miles flown on FAR Part 135 aircraft in Northwest Alaska in January 2003. Not shown here are the 20 percent of passenger miles in January 2003 flown in aircraft as FAR Part 121 air service.

It is clear from the data above that the Piper Navajo and its turbo-prop successor, the T-1040, should be the design aircraft, so that airports can accommodate a fully loaded Navajo even in snowy and icy runway conditions. The T-1040 is a nine-passenger commuter airliner that combines the wings, nose, and tail of the Cheyenne with the fuselage of the Chieftain. It is powered by two 500 horsepower turbo-prop engines. The prototype first flew in July 1981.

Table 3-9 Aircraft Used on FAR Part 135 Routes in Northwest Alaska in January 2003[a]

Aircraft	Air Passengers Carried	Passenger Miles	Percent Passengers	Percent Passenger Miles
Single Engine Aircraft				
Cessna 206 / 207	1,343	81,896	8%	5%
Cessna Caravan 208	7,021	458,628	40%	30%
Twin Engine Aircraft				
Piper Navajo	6,191	726,441	35%	47%
Cessna Caravan II (F406)	1,962	152,175	11%	10%
King Air	1,017	131,134	6%	8%
Total	**17,534**	**1,550,274**	**100%**	**100%**

a. These data represent 92% of all passenger miles.

The aircraft shown in Figure 3-14 is a product of the recently created airline division of Piper. There are currently five of these aircraft in service in Alaska.

Figure 3-14 Piper T-1040

3.3.3 Design Aircraft for All FAR Part 135 Routes in Northwest Alaska

The environmental conditions in the region clearly indicate that twin-engine aircraft is needed for safe transport on longer routes. The piston engine aircraft that has become the commuter aircraft workhorse when payloads approach eight passengers is the old but still capable Piper Navajo and some of its twin-engine cousins like the Cheyenne and the Chieftain. These are “aging aircraft” that result in higher insurance costs and require a first-class parts supply.

The Cessna Caravan 208 has the capacity to carry extra mail and nine passengers. With its balanced field capability of 3,200 feet, it will see continued use on many of the FAR Part 135 routes. However, on longer routes, two engines are preferred.

This plan will determine when a route will no longer be effective as a FAR Part 135 route due to projected increases in mail and passenger volume. For FAR Part 121 service, the design aircraft shifts to the Beech 1900.

The requirement to carry both mail and passengers is pushing the carriers into investing in new fleets. The Beech 1900 is in the process of being replaced by commuter jets in the lower-48 and will be more available for Alaska service. In fact, the Beech 1900C is already a proven aircraft in Alaska as carriers use this aircraft on a regular basis.

Table 3-10 indicates the minimum standards for airports in the Northwest. The first column is the design standards for those airports that will remain as small airports even with the combined carriage of passengers and mail. The second column is for those runways that will become FAR Part 121 routes in the next 20 to 25 years. With the length being the major difference, the airport site should be chosen with eventual expansion to the dimensions in the right hand column. This column includes the design standards for combined mail and passenger carriage in Alaska. The airplane capacity that can be used in this situation was set by the federal legislation establishing the mail system at 7,500 pounds capacity.

Examination of Table 3-10 suggests that as DOT/PF constructs new runways or runway extensions that we go to the B-II design standards with a 4,000-foot length. A second mobilization for 300 feet additional runway length does not seem warranted. If it is on a FAR Part 135 route that will continue as a FAR Part 135 route, the added 300 feet may be used with a displaced threshold or initially as a part of the safety area.

Table 3-10 Airport Design Designations for Airports in Northwest Alaska

Item	B-I or A-II Standards FAR Part 135 Capability	B-II Design Standards FAR Part 121 Operations for Passenger and Mail (Maximum Bush Aircraft Capacity 7,500 Pounds)
Design Aircraft for Runway Length	Piper Navajo	Beech 1900
Runway Length	3,700 feet	4,000 feet
Runway Width (safety where high winds exist)	75 feet	100 feet (or 75)
Airplane Design Group Level		
Runway Shoulder	10 feet	10 feet
Runway Safety Area Width	150 feet	150 feet
Runway Safety Area Length beyond the Runway End	300 feet	300 feet
Runway Object free Area Width	500 feet	500 feet
Runway Object Free Area beyond Runway End	300 feet	300 feet
		Recommended for all Airports in Northwest Alaska

DOT/PF might limit maintenance and snow removal to 3,700 feet forcing the airport to be operated as FAR Part 135. The width 75 or 100 feet is up to the design and the nature of landing winds, etc.

3.3.4 Carrier Impact

To meet the requirement to carry both mail and passengers simultaneously, carriers will have to obtain new aircraft to continue some air routes. The legislation puts pressure on the carriers to institute FAR Part 121 service. The aircraft in Table 3-11 have operated in remote Alaska and meet FAR Part 121 service requirements. Runway requirements are given for each type of aircraft. Note that in the analysis, the Beech 1900 is configured as a twelve-passenger aircraft with a displaced bulkhead to carry more mail.

Table 3-11 Aircraft Meeting Criteria for FAR Part 121 Air Service

Aircraft Type	Number in Alaska	Carriers[a]	Capacity	Runway Length Requirement	Passenger Capacity	Production Status
Beech 1900	7	FFS, HAG, BER, PNA	4,000 lbs	4,000 feet	19	207 Cs produced; now D model
Beech 1300	2	FFS	—	3,600 feet	13	—
Beech C99	2	CSY	3,200 lbs	3,400 feet	13 to 15	75 Cs, last one in 1986
Beech King Air 200	4	BER, GRT, YUT	4,000 lbs	4,000 feet	13	2,100 built & still in production
CASA 212	4	BER, RYA, VLA	6,200 lbs	2,900 feet	23	Over 435 built
Bombardier, Twin Otter	4	ERA	4,100 lbs	3,100 feet	19	Over 800 built; last one in 1988
Fairchild Metro	3	PNA	3,700 lbs.	4,000 feet	19	Over 1,000 built

a. See footnote to Table 3-2 for carrier names.

3.3.5 Supply to Meet Demand

We conclude that 4,000-foot runways are needed at all Northwest Alaska airports. Which airports will be addressed first? Which ones can wait awhile? Certainly, neither passengers nor mail delivery travels in a constant steady stream. Passengers tend to fly more at certain times of the year. There are times when stores in communities order for several weeks at a time and when the orders exceed several thousand pounds. The average for most major orders is about 4,000 pounds.

In order to set priorities, statistics on passenger travel and mail movement were gathered. Then these statistics were applied to the aircraft on a given route. This method, developed for this plan, is called the Northwest Planning Simulation. The OAG provided information on the number of flights currently going to each community on a given route.

The simulation then "flew" the route every day for one 350-day year. The flight operations consisted of an identical number of flights on each of five weekdays, plus operations on Saturday and Sunday.

The simulation was first run for the flights in 2000. Then the simulation was run for flights in 2005, 2015, and 2025 using the demand figures presented in Section 3.2.

In the simulation, each route is examined using Cessna Caravan 208s (Figure 3-15).

Figure 3-15 Cessna Caravan 208 with Belly Pod for Added Cargo

As the demand for passenger service on that route grows with time, the simulation provides the number of Caravan 208 flights that would be needed to meet that demand. When the scheduled flights could no longer carry 95 percent of the mail or more, flights were added. In the simulation, priority was given to passenger travel; passengers were accommodated on almost all flights. When the number of Cessna Caravan 208 flights needed to accommodate passenger and mail demand on that route became excessive, then the simulation was used to determine how many flights of the Beech 1900 would be needed on this route to accommodate the demand.

Figure 3-16 Raytheon Beechcraft 1900C

3.4 Northwest Arctic Borough Subregion

3.4.1 Demand Forecast

Demand for air service was forecast using techniques presented in Section 3.2. Three decades of population, enplanements, and mail volume for the Northwest Arctic Borough subregion are presented in Table 3-12 — actual data for 1995 and forecasts for 2005, 2015, and 2025. Point Hope is included in the enplanement/mail portion of the demand, as it is served from the Kotzebue hub although it is located in the North Slope Borough. By 2025, the Kotzebue hub is forecast to receive over 16,000 tons of mail, more than one ton for every person in the subregion.

3.4.2 Route Structure and Analysis

Figure 3-17 shows four main routes from Kotzebue that serve eleven communities. The longest route is Route 1 - Kotzebue to Ambler to Kobuk and Shungnak. The round trip flight distance is approximately 315 miles. Route 2 serves the communities of Deering and Buckland from Kotzebue with a round trip flight distance of approximately 177 miles. Route 3 is the most heavily flown route and is reasonably close to the hub. The Kotzebue-Kiana-Selawik-Noorvik flight covers a distance of approximately 164 miles. Route 4 goes north from Kotzebue to Noatak, Kivalina, and Point Hope, a flight distance of approximately 313 miles.

The next four sections present the results of the simulation analysis for these routes. Each analysis ascertains the capability of a scheduled fleet of aircraft equivalent to the Cessna Caravan 208 to deliver both passengers and mail. Each analysis begins with the best estimate of the current service. Then Cessna Caravan 208s are substituted for the actual aircraft (often Cessna 206s and 207s) and mail volume is added to the number of passengers carried.

As prescribed by federal law, the mail to be loaded is 70 percent of the total mail. Each day simulated flights are loaded with mail and passengers. There are some days when there is not sufficient capacity in the aircraft fleet to handle the mail. In those cases, extra flights are added to the service to allow complete carriage of mail and passengers. If the number of extra flights it takes to carry the passengers exceeds 50 or if more than five percent of the mail cannot be delivered on scheduled flights, then the simulation indicates the need to increase the number of scheduled daily flights.

When in order to serve the projected passengers and mail it is necessary to add three or more scheduled weekday flights, the route is upgraded to a FAR Part 121[6] route, with the result that the aircraft utilized must have the capability of a Beech 1900. Of the four routes, Routes 3 and 4, the two most heavily traveled, are shown to need upgrading to FAR Part 121 routes — Route 3 within the next five years and Route 4 in ten to twelve years.

6. See section Table 3-8 for the differences between Federal Air Regulation (FAR) Part 135 and Part 121 air service.

Table 3-12 Northwest Arctic Borough Subregion Forecast of Population, Enplanements, and Mail

Community	1995			2005			2015			2025		
	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)
Ambler	282	1,684	290	341	1,988	338	419	2,500	455	502	3,108	584
Buckland	386	3,422	352	448	3,591	480	550	4,489	655	660	5,569	857
Deering	156	1,684	133	150	1,859	164	184	2,068	209	221	2,308	255
Kiana	413	3,930	358	428	3,427	418	526	4,269	570	630	5,263	742
Kivalina	377	2,975	320	416	4,520	458	511	5,251	623	612	6,089	808
Kobuk	99	807	77	120	2,593	112	148	2,753	142	177	2,923	170
Noatak	385	4,508	343	473	4,544	466	580	5,810	638	695	7,326	835
Noorvik	574	4,109	496	700	1,715	693	860	2,238	972	1,030	2,878	1,299
Point Hope[a]	717	4,910	974	812	5,414	1,159	920	6,325	1,453	992	6,972	1,667
Selawik	654	4,697	555	852	5,743	808	1,047	7,487	1,144	1,254	9,590	1,545
Shungnak	241	1,674	230	283	1,975	266	347	2,300	353	416	2,680	448
Community Total	**4,284**	**34,400**	**4,129**	**5,023**	**37,370**	**5,361**	**6,092**	**47,505**	**7,216**	**7,189**	**54,704**	**9,209**
Kotzebue	2,751	58,127	3,908	3,403	58,933	5,105	4,179	66,241	6,269	5,007	74,534	7,511
Subregion Total	**7,035**	**92,527**	**8,148**	**8,426**	**96,303**	**10,566**	**10,271**	**113,745**	**13,585**	**12,196**	**129,238**	**16,821**

a. Point Hope is located in the North Slope Borough, but most of its scheduled air service is from Kotzebue.

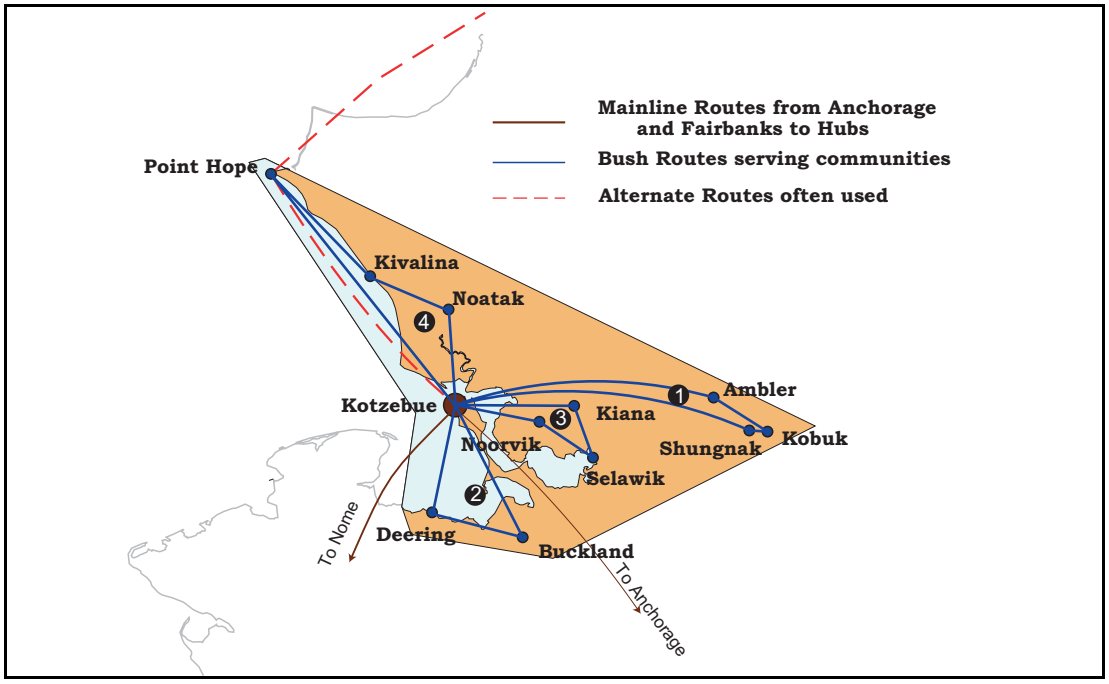


Figure 3-17 Air Carrier Route Structure for Northwest Arctic Borough Subregion

Service Analysis for Route 1

The analysis of Route 1 in Table 3-13 shows that through 2025, 100 percent of passenger traffic and the requisite 70 percent of the mail can be easily handled by scheduled service provided by Cessna Caravan 208s and equivalent aircraft; only a small increase in the number of flights is necessary. The route can remain a FAR Part 135 route. As Table 3-13 shows, all of the passengers and 97 percent of the mail in 2025 can be handled with the addition of one flight a day over the service level in 2015. However, problems of delivering fuel by barge on the shallow Kobuk River are significant, a fact that requires DOT/PF to plan for an occasional air delivery of fuel by DC-6 aircraft. This would require a 4,000-foot runway at all three communities. Table 3-14 summarizes the airport runway dimension requirements.

Table 3-13 Route 1 Service Performance

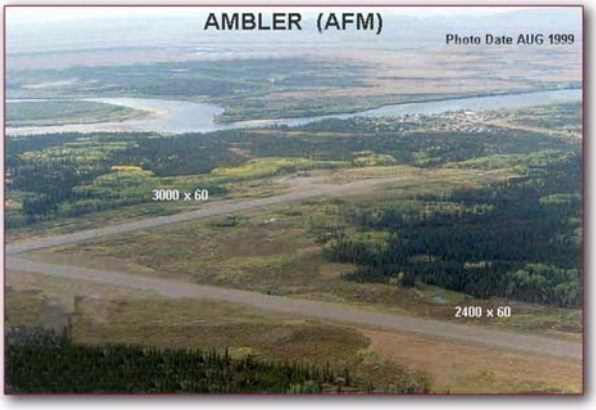
Kotzebue-Ambler-Shungnak-Kobuk Round-trip Distance: 315 miles	Current Service Without Mail	Forecast with Passengers & Mail		
		2005	2015	2025
Number of Flights on: Weekdays / Saturday / Sunday	6/3/2	6/3/2	6/4/2	7/5/3
Number of Annual Scheduled Flights (50-week year)	1,750	1,750	1,800	2,150
Number of Non-Scheduled Flights Added to Fulfill Service	0	9	20	16
Number of Passengers Enplaned	7,862	12,547	15,869	17,828
% Passengers Accommodated on Scheduled Flights	100%	100%	100%	100%
Mail Delivered (tons)	0	512	640	714
% Mail Delivered on Scheduled Passenger Flights [a]	0	98%	96%	97%

a. The law requires that passenger flights accommodate 70% of the mail. All-cargo flights and other flights carry the remaining 30%. Currently, a small amount of mail is delivered on scheduled aircraft that also carries passengers, but not nearly close to 70%.

Table 3-14 Route 1 Runway Dimension Recommendations

Airport	Present Runway (feet)[a]	Design Aircraft[b]	Needed Runway (feet)	Remarks
Ambler:				
Primary Crosswind	3,000 x 60 2,400 x 60	Beech 1900	4,000 x 75 3,200 x 75	Occasional fuel delivery is the major reason for runway length of 4,000 feet. Crosswind runway essential for service during the fall.
Kobuk	2,360 x 58	Beech 1900	4,000 x 75	Occasional fuel delivery is the major reason for runway length of 4,000 feet.
Shungnak	4,000 x 60	Beech 1900	4,000 x 75	Meets need to 2025. Occasional fuel delivery does not require wider runway.

a. State standards for runway dimensions exist for FAR Part 135 airports. These standards are 3,400 x 60 feet. Public-use airports should have at least one runway that meets these standards.
b. Note that the design aircraft for Ambler, Kobuk, and Shungnak is not the DC-6 (B-III) because fuel delivery is only occasional.



http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-18 Ambler Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-20 Shungnak Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-19 Kobuk Airport

Service Analysis for Route 2

Route 2 is fairly close to the hub, Kotzebue. As can be seen in Table 3-15, passenger and mail demand can be handled easily with the current level of service. It need not be changed from its present status as a FAR Part 135 route. Fuel delivery is not an issue for these communities. The requirements on the airport runway dimensions are summarized in Table 3-16.

Table 3-15 Route 2 Service Performance

Kotzebue-Buckland-Deering Round-trip Distance: 177 miles	Current Service Without Mail	Forecast with Passengers & Mail		
		2005	2015	2025
Number of Flights on: Weekdays /Saturday / Sunday	4/4/2	4/4/2	4/4/2	5/5/3
Number of Annual Scheduled Flights (50-week year)	1,300	1,300	1,300	1,650
Number of Non-Scheduled Flights Added to Fulfill Service	0	8	12	9
Number of Passengers Enplaned	9,556	9,500	9,700	11,100
% Passengers Accommodated on Scheduled Flights	100%	100%	100%	100%
Mail Delivered (tons)	0	350	398	469
% Mail Delivered on Scheduled Passenger Flights	0	97%	96%	97%

Table 3-16 Route 2 Runway Dimension Recommendations

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Buckland	3,200 x 70	Beech 1900	4,000 x 75	Primary runway length meets need to 2025.
Deering: Primary Crosswind	 2,600 x 50 2,080 x 60	Beech 1900	 4,000 x 75 3,200 x 75	Primary runway length will be brought up to 4,000 feet but low priority due to proximity to Kotzebue. Crosswind runway is usually 80% of primary runway.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-21 Buckland Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-22 Deering Airport

Service Analysis for Route 3

Route 3 is one of the most heavily traveled routes in the Northwest region. An additional 550 flights per year of a Cessna Caravan 208 or equivalent aircraft will be needed by 2025 to carry passengers and mail. This increase in scheduled air service would reduce the needed non-scheduled flights from 84 to 44. The last column shows that a reduction from 14 to 11 weekday flights will provide adequate service in 2025 when the Beech 1900 is substituted for the Cessna Caravan 208. This route should accommodate FAR Part 121 aircraft within five years. The runway dimension requirements for these airports are summarized in Table 3-18. The Selawik airport presents the most difficult problem. The present primary and crosswind runways cannot be extended without impinging on the rivers. Selawik airport must be relocated as soon as possible so that it does not impair the performance on this very busy route.

Table 3-17 Route 3 Service Performance

Kotzebue-Kiana-Noorvik-Selawik Round-trip Distance: 164 miles	Current Service		Forecast with Passengers & Mail		
	Without Mail	With Mail	2005	2015	2025 (FAR Part 121)
Number of Flights on: Weekdays / Saturday / Sunday	10/10/4	10/10/4	12/11/4	14/13/5	11/10/6
Number of Annual Scheduled Flights (50-week year)	3,200	3,200	3,750	4,400	3,450 (1900s)
Number of Non-Scheduled Flights Added to Fulfill Service	0	84	44	50	39 (208s)
Number of Passengers Enplaned	28,600	29,400	29,600	37,800	45,800
% Passengers Accommodated on Scheduled Flights	100%	100%	100%	100%	100%
Mail Delivered (tons)	0	1,430	1,435	1,834	2,050
% Mail Delivered on Scheduled Passenger Flights	0	91.5%	96%	96%	97%

Table 3-18 Route 3 Runway Dimension Recommendations

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Kiana	3,400 x 100	Beech 1900	4,000 x 100	Needs 4,000 x 100 runway as soon as possible.
Noorvik	4,000 x 100	Beech 1900	4,000 x 100	Meets need to 2025.
Selawik: Primary Crosswind	 3,000 x 60 2,670 x 60	Beech 1900	 4,000 x 75 3,200 x 60	Water at both ends of both runways requires relocation of airport. Heavy traffic suggest that this is a high priority.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-23 Kiana Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-24 Noorvik Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-25 Selawik Airport

Service Analysis for Route 4

Route 4 is both long and heavily traveled. The key community on this route is Point Hope. Its airport receives large numbers of passengers and large amounts of bypass mail. In addition, it is on one passenger route (one round-trip per day) connecting Barrow and Kotzebue, though this route is not analyzed here. Point Hope receives all its mail through Kotzebue. Table 3-19 shows that this route needs to accommodate FAR Part 121 service with Beech 1900 aircraft before 2025.

The airport serving the community of Kivalina is unique. Situated on a narrow spit of land between the sea and a bay, both the community and airport are subject to weather patterns causing large, increasingly severe wave impingement and flooding. Kivalina must consider a move inland. Until that move occurs, research is needed to determine the feasibility of strengthening the taxiway in order to accommodate Beech 1900 aircraft. Both Noatak and Point Hope airports already have sufficient runway capacity to meet the upgrade requirements for handling 1900s and FAR 121 service.

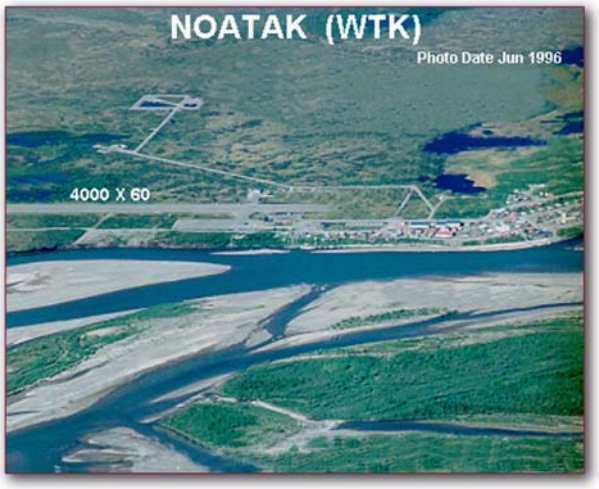
Table 3-19 Route 4 Service Performance

Kotzebue-Noatak-Kivalina-Point Hope Round-trip Distance: 313 miles	Current Service		Forecast with Passengers & Mail		
	Without Mail	With Mail	2005	2015	2025 (FAR Part 121)
Number of Flights on: Weekdays / Saturday/ Sunday	7/7/3	7/7/3	11/10/4	13/12/4	7/7/3
Number of Annual Scheduled Flights (50-week year	2,250	2,250	3,750	4,050	2,250 (1900s)
Number of Non-Scheduled Flights Added to Fulfill Service	0	31	25	16	29 (208s)
Number of Passengers Enplaned	21,900	22,700	30,100	34,100	36,400
% Passengers Accommodated on Scheduled Flights	100%	99%	100%	100%	100%
Mail Delivered (tons)	0	930	1,330	1,485	1,550
% Mail Delivered on Scheduled Passenger Flights	0	96%	96%	99%	99%

Table 3-20 Route 4 Runway Dimension Recommendations

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Noatak	4,000 x 75	Beech 1900	4,000 x 75	Meets need to 2025.
Point Hope	4,000 x 75	Beech 1900	4,000 x 75	Meets need to 2025.
Kivalina	3,000 x 60	Beech 1900	4,000 x 75	The airport runway extension will occur with relocation of community. Meanwhile, consider strengthening the taxiway; obtain permission from the FAA[a] for special use.

a. FAA – Federal Aviation Administration



http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-26 Noatak Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-28 Point Hope Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-27 Kivalina Airport

3.4.3 The Hub Airport at Kotzebue

The Ralph Wien Memorial Airport in Kotzebue is the hub for this subregion. It is a primary airport with over 60,000 enplanements per year and an average 175 operations per day. It receives about 8,500 tons of mail and 1,300 tons of air-freight annually. The primary runway is 5,900 by 150 feet, and the crosswind runway is 3,800 by 100 feet. There is a precision instrument approach on Runway 8. The airport serves regular jet flights from Anchorage (two or three times a day) as well as enplanements from outlying communities, mostly in small light aircraft.

Kotzebue Airport is running out of available lease lots. The Aviation Improvement Program includes a project to expand the general aviation apron and create additional lease lots. Other issues are:

- Inadequate area to meet FAA standards for safety areas
- Obstructions on the approach to runway 26, scheduled to be addressed by an upcoming obstruction removal project
- Highly traveled road within the Runway Protection Zone of Runway 8 that poses a safety hazard.

The City of Kotzebue is limited in its ability to expand; facilities such as its sewage lagoons are located on airport property. There have been some discussions about relocating the airport to Cape Blossom, which is approximately 12 miles south of the city. The Kotzebue Airport Master Plan was completed in 1998. A relocation feasibility study is currently scheduled for 2005.

3.4.4 Action Plan Summary

Runways at airports serving Buckland, Noatak, Noorvik, Point Hope, and Shungnak are adequate to meet air service needs past 2025. Table 3-21 summarizes the recommendations for the remaining airports in this subregion.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-29 Ralph Wien Memorial Airport, Kotzebue

Table 3-21 Northwest Arctic Borough Subregion Recommended Runway Improvements

Airport	Priority	Present Runway	Needed Runway	Remarks
Selawik Primary	High	3,000 x 60	4,000 x 75	Water at both ends of both runways requires relocation of airport. Heavy traffic suggests that this is a high priority.
Selawik Crosswind		2,670 x 60	3,200 x 60	Construct at same time.
Kiana	High	3,400 x 100	4,000 x 100	Needs 4,000 x 100 runway as soon as possible.
Kivalina	High	3,000 x 60	4,000 x 75	The Kivalina airport is located on a narrow spit of land with its taxiway at the end of the runway. The airport runway extension will occur with relocation of community. Meanwhile, consider strengthening the taxiway; obtain permission from the Federal Aviation Administration for special use.
Ambler Primary	Medium	3,000 x 60	4,000 x 75	Occasional fuel delivery is the major reason for runway length of 4,000 feet.
Ambler Crosswind		2,400 x 60	2,720 x 60	Crosswind runway essential for service during the fall.
Deering Primary	Medium	2,600 x 50	4,000 x 75	Primary runway length will be brought up to 4,000 feet.
Deering Crosswind		2,080 x 60	3,200 x 75	Crosswind runway is usually 80% of primary runway.
Kobuk[a]	Medium	2,360 x 58	4,000 x 75	Occasional fuel delivery is the major reason for runway length of 4,000 feet.

a. Kobuk may need to be expanded at some point to 4,000 feet for fuel delivery. A possible alternative: The Dahl Creek airport (4,000 feet) is about eight miles north. A road connects this airport with the community of Kobuk. While it is not open all year, the road plus a tank truck operating in summer may be an alternative solution.

3.5 North Slope Borough Subregion

3.5.1 Demand Forecast

Table 3-22 presents the passenger and mail demand forecasts for the North Slope Borough subregion. Anaktuvuk Pass and Point Hope are listed because they are located in the North Slope Borough. However, they are not served from Barrow, the hub for this subregion, but from Fairbanks and Kotzebue respectively. Deadhorse is not a community airport, but the airport serves an important function of transfer of passengers, mail, and freight in support of the oil exploration in the Prudhoe Bay area. Its enplanements of oil workers and related personnel are largely from Anchorage on Alaska Airlines jet aircraft with workers entering and leaving the area every three or four weeks.

Bypass mail destined for Nuiqsut or Kaktovik is brought to the Deadhorse airport on the Dalton Highway from Anchorage or Fairbanks and then flown out to these communities. The relatively high enplanement forecast for Nuiqsut is due to its increasing role as a support base for oil and gas exploration and production in the National Petroleum Reserve–Alaska.

Table 3-22 North Slope Borough Subregion Forecast of Population, Enplanements, and Mail

Community	1995			2005			2015			2025		
	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)
Anaktuvuk Pass[a]	278			301			339			364		
Atqasuk	230	1,944	228	245	2,356	292	278	3,004	359	300	3,765	418
Kaktovik	212	1,899	294	313	2,847	370	352	3,607	451	378	4,474	523
Nuiqsut	411	1,783	305	465	3,022	431	527	4,008	594	569	5,080	755
Point Hope [b]	717			812			961			1,046		
Point Lay	177	1,674	237	263	2,481	395	295	3,138	443	316	3,906	474
Wainwright	534	5,083	775	587	3,298	766	666	4,776	936	719	6,293	1,083
Community Total	**2,559**	**42,918**	**1,839**	**2,986**	**38,572**	**2,255**	**3,418**	**44,949**	**2,784**	**3,692**	**50,229**	**3,253**
Barrow	4,181	55,301	5,332	4,828	52,576	6,210	5,309	63,481	7,360	5,633	73,748	8,372
Subregion Total	**6,740**	**98,219**	**7,171**	**7,814**	**91,147**	**8,465**	**8,727**	**108,430**	**10,144**	**9,325**	**123,977**	**11,625**
From Fairbanks/Deadhorse to Nuiqsut and Kaktovik			531			883			1,176			1,417

a. Anaktuvuk Pass is served from Fairbanks (see Route 7).
b. Point Hope is served from Kotzebue (see Route 4).

All airports in this subregion except those in Barrow and Deadhorse are owned and operated by the North Slope Borough. This plan reviews airports in this subregion regarding their capacity, but responsibility for new master plans, Airport Layout Plans, and capital projects rest with the borough government.

3.5.2 Route Structure and Analysis

Figure 3-30 presents the air route structure in this subregion. There is one main air route (Route 5) emanating from Barrow, the hub. That route serves Atqasuk, Point Lay, and Wainwright over a round-trip distance of 381 miles.

There is also passenger service (Route 6) to Nuiqsut and Kaktovik from both Fairbanks and Barrow. The service from Barrow currently serves about 60 percent of the passenger traffic on the route, while most of the remaining passengers go to Deadhorse to connect to Fairbanks or Anchorage. Kaktovik enplanes 40 percent of its passengers for Fairbanks, 20 percent for Deadhorse (then on to Fairbanks or Anchorage) and 40 percent for Barrow. The mail for Kaktovik and Nuiqsut comes up the Dalton Highway to Deadhorse before it is flown to the two communities.

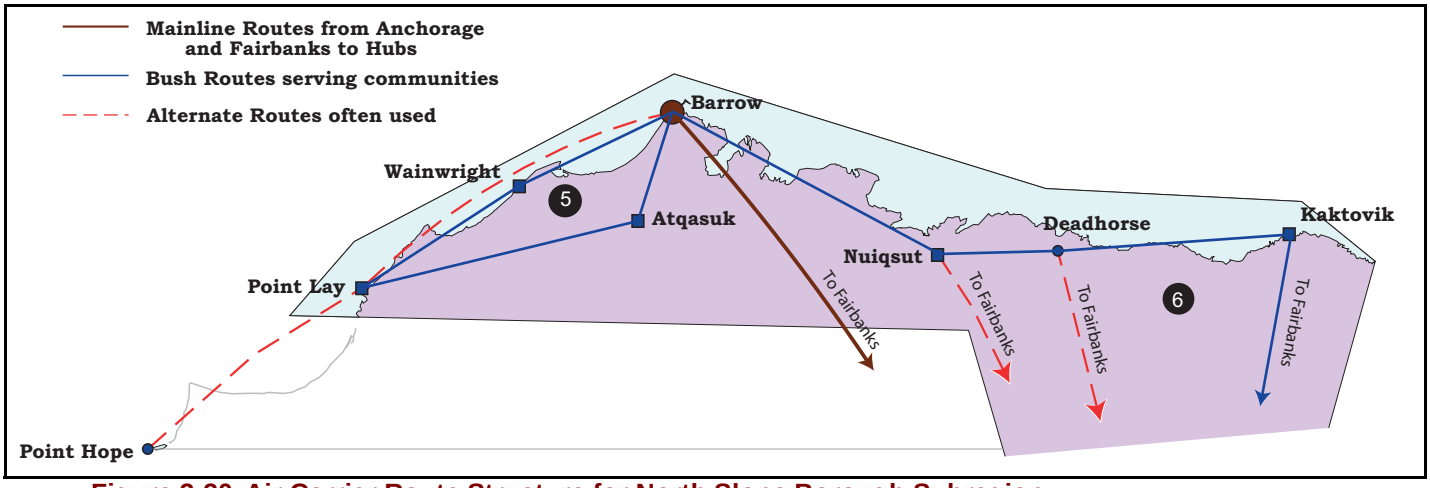


Figure 3-30 Air Carrier Route Structure for North Slope Borough Subregion

Service Analysis for Route 5

The analysis of Route 5 in Table 3-23 shows that through 2025, 100 percent of the passenger traffic and the requisite 70 percent of the mail can be handled within the scheduled service provided by aircraft equivalent to Cessna Caravan 208. The dual column in the middle reflects the fact that the current service does not include Point Lay for all scheduled flights. However, for the analysis, all flights assumed Point Lay as a stop.

This route can remain a FAR Part 135 route. But, given the weather, long distances, and rugged terrain, two-engine, two-pilot aircraft (Beech 1900) would provide safer service. All the runways except Point Lay's are of sufficient length to accommodate the Beech 1900. Since FAR Part 135 operation will serve the area, if two-engine aircraft are deemed necessary, the Piper Navajo, requiring 3,700 feet, can be handled by all airports. Table 3-24 provides the runway dimension recommendations for Beech 1900 service.

Table 3-23 Route 5 Service Performance

Barrow-Wainwright-Point Lay-Atqasuk (not all flights go to Point Lay) Round-trip Distance: 381 miles (without Point Lay: 207 miles)	Current Service		Forecast with Passengers & Mail		
	Without Mail Without Pt. Lay	Without Mail With Pt. Lay	2005	2015	2025
Number of Flights on: Weekdays / Saturday / Sunday	3/2/0	6/5/2	9/8/2	10/8/2	10/9/2
Number of Annual Scheduled Flights (50-week year)	850	1,850	2,750	3,750	4,050
Number of Non-Scheduled Flights Added to Fulfill Service	0	0	25	25	21
Number of Passengers Enplaned	14,700		15,700	18,700	22,100
% Passengers Accommodate on Scheduled Flights	100%		99%	100%	100%
Mail Delivered (tons)	0		1,023	959	1,095
% Mail Delivered on Scheduled Passenger Flights	0		97%	99.5%	97%

Table 3-24 Route 5 Runway Dimension Recommendations

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Atqasuk	4,370 x 110	Beech 1900	4,000 x 75	Meets need to 2025.
Wainwright	4,494 x 90	Beech 1900	4,000 x 75	Meets need to 2025.
Point Lay	3,590 x 80	Beech 1900	4,000 x 80	Two-engine, two-pilot aircraft are recommended to provide full service over the entire route, but this is a decision for the North Slope Borough to make.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-31 Atqasuk Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-32 Wainwright Airport

Service Analysis for Route 6

The two communities served by Barrow on this route are Nuiqsut and Kaktovik. The latter includes the Barter Island Long Range Surveillance System. Eighty percent of Kaktovik enplanements are evenly split between Fairbanks and Barrow, with about 20 percent going to Deadhorse (and on to Fairbanks and Anchorage). Nuiqsut has 60 percent of its enplanements going to Barrow with most of the rest to Deadhorse. Nuiqsut enplanements have more than doubled since 1995 as it has become increasingly involved as a center for nearby oil exploration.

No service performance table is provided since most of the mail is distributed separately from the passenger traffic and the runways are all capable of FAR Part 121 operations. Eventually there may be jet service at Nuiqsut if the movement of personnel to the oil fields warrants it.

As indicated in Table 3-25, no improvement is needed for any of the airports on this route.

Table 3-25 Route 6 Runway Dimension Recommendations

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Barter Island / Kaktovik	4,820 x 100	Beech 1900	4,000 x 100	Meets need to 2025.
Nuiqsut	4,343 x 90	Beech 1900	4,000 x 100	Meets need to 2025.
Deadhorse	6,000 x 150	Boeing 737-400	Jet service	Meets need to 2025.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-33 Barter Island/Kaktovik Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-34 Nuiqsut Airport

3.5.3 The Deadhorse Airport

Deadhorse is a transfer airport serving both commuter lines and regular jet service from Fairbanks and Anchorage. Its largest role is in support of the oil exploration in the region. Alaska Airlines, under contract with the oil companies, brings 11,000 passengers per year from Anchorage to Deadhorse mostly for work in the oil fields. Most workers are on a two-week on and two-week off rotation with their off time usually spent in the greater Anchorage area. Alaska Airlines also brings about 3 million pounds of airfreight and 70,000 pounds of mail each year, some of it bypass mail.

Cape Smythe Airlines and Frontier Flying Service provide passenger service to Barrow, Nuiqsut, and Kaktovik and carry the mail to Nuiqsut and Kaktovik. The paved runway at Deadhorse, 6,500 by 150 feet, serves about 55 operations per day.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-35 Deadhorse Airport

3.5.4 The Hub Airport at Barrow

The Will Rogers/Wiley Post Memorial Airport at Barrow is the hub for this subregion. The Barrow hub is classified by the FAA as a primary airport with over 40,000 enplanements per year. It also handled about 5,200 tons of mail and about 2,700 tons of airfreight in 2002. The primary runway is 6,500 by 150 feet and averages about 35 operations a day. The airport serves regular jet flights from Anchorage with a stop in Fairbanks three times a day. The present location of the airport limits access largely due to fog. However, precision instrument landing system (ILS) is available on runway 6.

Improvements underway to the Barrow airport include runway reconstruction and paving, apron and taxiway expansion and paving, safety area expansion, and the extension and replacement of its security fencing. These projects are identified in the 2000 Barrow Airport Master Plan. A new master plan in the future will explore relocating the airport away from coastal fog. Relocation would also permit the town of Barrow to expand. Not currently deemed economically feasible, airport relocation will be addressed in the next Master Plan Update fifteen or twenty years from now.

3.5.5 Action Plan Summary

Point Lay is the only airport recommended for runway lengthening as shown in Table 3-26.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-36 Wiley Post / Will Rogers Memorial Airport, Barrow

Table 3-26 North Slope Borough Subregion Recommended Runway Improvements

Airport	Priority	Present Runway	Needed Runway	Remarks
Point Lay	Medium	3,590 x 80	4,000 x 75	Two-engine, two-pilot aircraft are recommended to provide full service over the entire route, but this is a decision of the North Slope Borough to make.

3.6 Middle Yukon River Basin Subregion

3.6.1 Demand Forecast

The demand for air service in the Middle Yukon River Basin is based on projected enplanements and mail volume as seen in Table 3-27. Anaktuvuk Pass is included here since it is served from Fairbanks even though it is located in the North Slope Borough. Galena serves as a hub for communities located near it. The notes (F) or (G) in the table indicate whether the community is served by Fairbanks (F) or Galena (G).

Road connections to Minto and Manley Hot Springs bring mail and some passengers into those communities. Nenana does not receive mail by air since it is on the Parks Highway. In addition, there is no scheduled air carrier passenger service for Nenana reported in the commuter statistics or the OAG.

The demand forecast is based on the overall community growth forecast and does not reflect the recent downturn in enplanements reflective of the economic difficulties in the region (poor fishing, loss of military base at Galena, etc.). Figure 3-37 suggests that enplanements will grow by a mere 0.26 percent per year. However, using the full ten-year historical data, growth in enplanements of about 1.25 percent per year can be expected.

3.6.2 Route Structure and Analysis

Figure 3-38 presents the route structure for the Middle Yukon River Basin subregion. There are five main routes. Routes 7, 8, and 9 emanate from Fairbanks. Routes 10 and 11 include Galena: Route 10 serves Galena from Fairbanks with Ruby and Tanana along the route, while Route 11 emanates from Galena to the three closest communities: Koyukuk, Nulato and Kaltag. Routes 7, 8, and 10 are the longest routes, each covering more than 500 miles. Routes 9 and 11 are both very close to the hubs, Fairbanks and Galena, respectively.

An analysis of air service in this subregion is presented in the next five sections. As in previous sections, each route analysis ascertains the ability of a fleet of Cessna Caravan 208 or equivalent aircraft to deliver both the projected passengers and the mail. In most cases all passengers plus 95 to 98 percent of the mail is delivered on regularly scheduled flights. However, on some routes extra flights are needed to ensure that all the mail is delivered. As in all the analyses, the

amount of mail used in the simulation is 70 percent of the total mail shown in the forecast.

Table 3-27 Middle Yukon River Basin Subregion Forecast of Population, Enplanements and Mail

Community Served by Fairbanks (F) or Galena (G)	1995			2005			2015			2025		
	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)
Allakaket (F)	177	2,758	95	176	1,797	169	191	2,278	209	201	2,679	242
Anaktuvuk Pass (F)[a]	295	3,443	355	295	3,728	378	320	4,547	463	337	5,207	531
Bettles (F)	60	2,526	92	74	2,468	80	80	2,838	100	85	3,137	117
Hughes (F)	61	1,073	50	82	1,525	59	88	1,898	74	93	2,208	87
Huslia (F)	245	2,443	197	306	3,121	220	332	3,886	270	350	4,507	309
Kaltag (G)	233	1,997	216	240	2,393	236	261	3,005	290	275	3,506	334
Koyukuk (G)	128	1,360	109	106	1,235	91	114	1,590	113	121	1,887	132
Manley Hot Springs (F)	95	147	17	75	49	17	82	132	18	86	221	18
Minto (G)	235	148	12	270	198	17	292	410	17	308	616	18
Nenana (F)	353	–	Road	414	–	Road	435	–	Road	445	–	Road
Nulato (G)	347	3,170	314	351	3,643	330	381	4,519	403	402	5,226	461
Rampart (F)	76	827	42	47	847	32	51	1,110	40	54	1,334	46
Ruby (G)	188	1,620	203	196	1,970	227	213	2,490	278	225	2,919	318
Tanana (F)	303	4,685	303	322	4,079	311	349	4,967	378	368	5,680	430
Community Total	**2,501**	**26,197**	**1,911**	**2,659**	**27,053**	**2,165**	**2,869**	**33,669**	**2,650**	**3,013**	**39,124**	**3,040**
Galena	**531**	**7,260**	**586**	**705**	**10,981**	**847**	**765**	**13,168**	**918**	**807**	**14,880**	**968**
Galena to Communities		2,832	459		5,655	650		6,781	795		7,663	912
Mail to Galena			1,045			1,496			1,713			1,880
FAI to Communities		23,205	1,453		23,536	1,516		29,291	1,855		34,038	2,128
Galena Enpl to FAI/ANC[b]		4,428			5,326			6,386			7,217	
FAI Enpl. to Galena		4,248			4,185			5,017			5,670	
Total for Subregion		**60,910**	**2,498**		**65,754**	**3,012**		**81145**	**3,568**		**93,712**	**4,008**
Community Enplanements		26,197			27,053			33,668			39,124	
Hub Enplanements		34,713			38,702			47477			54,588	

a. Anaktuvuk Pass population is not included in the totals since it is located in the North Slope Borough.
b. FAI = Fairbanks; ANC = Anchorage

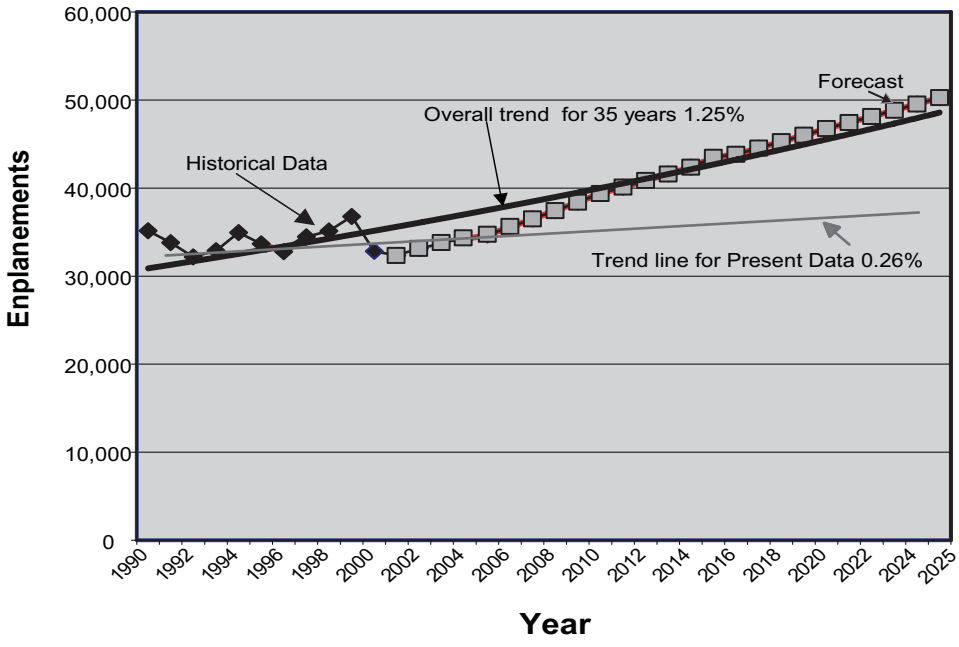


Figure 3-37 Enplanement Forecast for the Middle Yukon River Basin Subregion

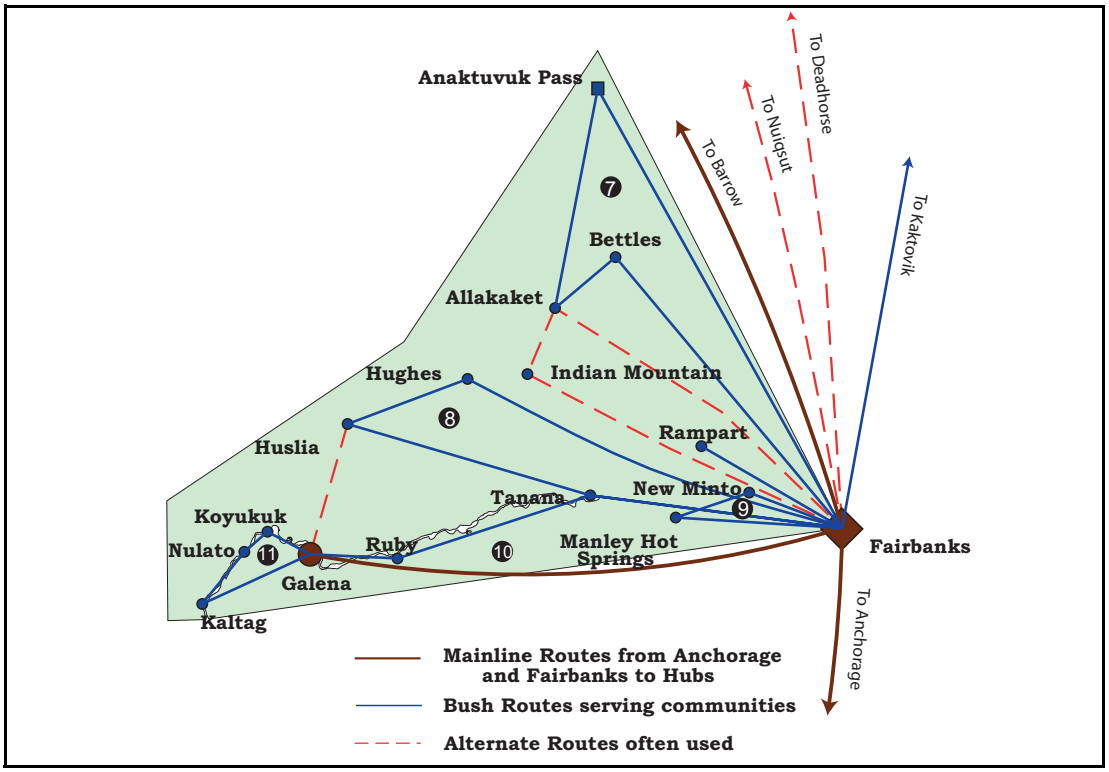


Figure 3-38 Air Carrier Route Structure for the Middle Yukon River Basin Subregion

Service Analysis for Route 7

Although Anaktuvuk Pass is located in the North Slope Borough, its primary air service is from Fairbanks; it is often on the same route as Bettles and Allakaket. This route is not heavily traveled, though there is seasonal activity as Bettles is a "jumping off" point for hunting and other sporting activities. Seasonal variation, though, does not change the route's forecasted air service demand. FAR Part 135 service will be adequate for some time though the airports already can accommodate FAR Part 121 service if necessary. There is no need for airport improvements through 2025 as indicated in Tables 3-28 and 3-29.

Table 3-28 Route 7 Service Performance

Fairbanks-Anaktuvuk Pass-Bettles-Allakaket Round-trip Distance: 588 miles	Current Service		Forecast with Passengers & Mail	
	Without Mail	With Mail	2015	2025
Number of Flights on: Weekdays / Saturday / Sunday	5/3/2	5/3/2	6/4/3	6/4/4
Number of Annual Scheduled Flights (50-week year)	1,550	1,550	1,850	1,900
Number of Non-Scheduled Flights Added to Fulfill Service	0	31	9	7
Number of Passengers Enplaned	11,534		9,100	10,500
% Passengers Accommodated on Scheduled Flights	100%	99%	100%	100%
Mail Delivered (tons)	0	456	542	493
% Mail Delivered on Scheduled Passenger Flights	0	96%	96%	99%

Table 3-29 Route 7 Runway Dimension Recommendations

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Anaktuvuk Pass	4,760 x 100	Beech 1900	4,000 x 75	Airport owned by North Slope Borough. Meets need to 2025.
Bettles	5,200 x 150	Beech 1900	4,000 x 75	Meets need to 2025.
Allakaket	4,000 x 80	Beech 1900	4,000 x 75	Meets need to 2025.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-39 Anaktuvuk Pass Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-40 Bettles Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-41 Allakaket Airport

Service Analysis for Route 8

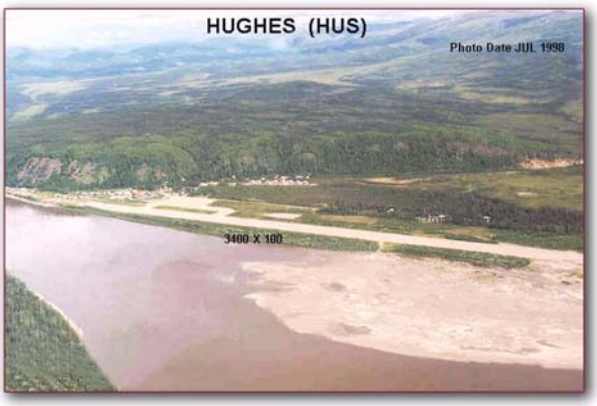
As can be seen in Figure 3-38, Hughes and Huslia are quite far from many other communities in the subregion. The passenger and mail demand can be handled easily with the current level of service as a FAR Part 135 route; fuel delivery is not an issue for these communities. The requirements on the airport runway dimensions are summarized in Table 3-31.

Table 3-30 Route 8 Service Performance

Fairbanks-Hughes-Huslia Route-Trip Distance: 521 Miles	Current Service		Forecast with Passengers & Mail	
	Without Mail	With Mail	2015	2025
Number of Flights on Weekdays / Saturday / Sunday	3/2/1	3/2/1	4/3/2	4/3/2
Number of Annual Scheduled Flights (50-week year)	900	900	1,250	1,250
Number of Non-Scheduled Flights Added to Fulfill Service	0	19	4	7
Number of Passengers Enplaned	7,183	8,000	10,140	11,822
% Passengers Accommodated on Scheduled Flights	100%	99%	100%	100%
Mail Delivered (tons)	0	225	272	285
% Mail Delivered on Scheduled Passenger Flights	0	93%	98%	98%

Table 3-31 Route 8 Runway Dimension Recommendations

Airport	Present Runway (ft)	Design Aircraft	Needed Runway (ft)	Remarks
Hughes	3,400 x 100	Beech 1900	4,000 x 75	Adequate for FAR Part 135 service. Flooding limits use in the spring. This may necessitate moving runway.
Huslia	3,000 x 60	Beech 1900	4,000 x 75	Present runway mostly adequate for FAR Part 135 service. Runway eventually a candidate for increased length.



http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-42 Hughes Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-43 Huslia Airport

Service Analysis for Routes 9a and 9b

Route 9a to Minto and Manley Hot Springs is flown three times per week. Traffic on this route in 2002 numbered 192 passengers and 32 tons of mail. Clearly, FAR Part 135 service will handle the traffic on this route for a very long time, considering that there is a road connection to both. The airports of Minto and Manley Hot Springs should be brought up to the state standard runway length of 3,400 feet as suggested in Table 3-32.

Route 9b is direct from Fairbanks to Rampart with once-a-day service. The largest number of enplanements was 48 in July along with one half ton of mail. FAR Part 135 service will also suffice on this route through 2025 since there is a road under construction to Rampart from Fairbanks. Rampart's runway length at 3,500 feet meets the state standard. Table 3-32 indicates that the Rampart airport meets the demand for air service to 2025.

Table 3-32 Route 9 Runway Dimension Recommendations

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Manley Hot Springs	2,875 x 40	Cessna 208	3,400 x 60	Since it is on the road, the state standard of 3,400 feet is sufficient.
Minto	2,000 x 65	Cessna 208	3,400 x 60	Since it is on the road, the state standard of 3,400 feet is sufficient.
Rampart	3,500 x 75	Cessna 208	3,400 x 60	Meets need to 2025.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-44 Manley Hot Springs Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-46 Rampart Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-45 New Minto Airport

Service Analysis for Route 10

This route serves the three Yukon River communities of Tanana, Ruby, and Galena from Fairbanks. Table 3-33 shows a continual increase in the number of flights per year to meet the forecasted demand. By 2025, more extensive service provided by the Beech 1900 under FAR Part 121 will be needed. Since the mail comes to Galena on flights from both Anchorage and Fairbanks, this Fairbanks route does not carry all the mail. The airports currently are all adequate for FAR Part 121 service.

Table 3-33 Route 10 Service Performance

Fairbanks-Tanana-Ruby-Galena Round-trip Distance: 542 miles	Current Service Without Mail	Forecast with Passengers & Mail			
		2005	2015	2025	2025 (FAR Part 121)
Number of Flights on Weekdays / Saturday / Sunday	5\3\2	5/3/2	6/4/3	7/5/3	5/3/2
Number of Annual Scheduled Flights (50-week year)	1,500	1,500	1,850	2,150	1500 (1900s)
Number of Non-Scheduled Flights Added to Fulfill Service	0	15	26	24	26 (208s)
Number of Passengers Enplaned	19,050	20,050	23,700	27,000	29,980
% Passengers Accommodated on Scheduled Flights	100%	100%	100%	100%	100%
Mail Delivered (tons)	0	386	428	451	489
% Mail Delivered on Scheduled Passenger Flights	0	98%	99%	99%	98%

Table 3-34 Route 10 Runway Dimension Recommendations

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Tanana	4,400 x 150	Beech 1900	4,000 x 75	Meets need to 2025.
Ruby	4,000 x 100	Beech 1900	4,000 x 75	Meets need to 2025.
Galena	7,254 x 150	Jet	5,000 x 100	Meets need to 2025.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-47 Tanana Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-48 Ruby Airport

Service Analysis for Route 11

This route serves the communities of Kaltag, Nulato, and Koyukuk from Galena as shown in Table 3-35. Galena has direct passenger service to Anchorage. The close proximity of these airports to Galena, with the mail being processed through Galena, means that travel will remain a FAR Part 135 route. Only the airport at Koyukuk needs an increase to meet state standards.

Table 3-35 Route 11 Service Requirements

Galena-Kaltag-Nulato-Koyukuk Round-trip Distance: 135 Miles	Current Service		Forecast with Passengers & Mail	
	Without Mail	With Mail	2015	2025
Number of Flights on Weekdays / Saturday / Sunday	5/3/2	5/3/2	6/3/3	6/3/3
Number of Annual Scheduled Flights (50-week year)	1,500	1,500	1,800	1,800
Number of Non-Scheduled Flights Added to Fulfill Service	0	1	5	5
Number of Passengers Enplaned	13,400	13,200	17,588	18,559
% Passengers Accommodated on Scheduled Flights	100%	99%	99%	100%
Mail Delivered (tons)	0	250	332	367
% Mail Delivered on Scheduled Passenger Flights	0	99%	99%	99%

Table 3-36 Route 11 Runway Dimension Recommendations

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Kaltag	5,000 x 100	Beech 1900	4,000 x 75	Meets need to 2025.
Nulato	4,000 x 100	Beech 1900	4,000 x 75	Meets need to 2025.
Koyukuk	3,000 x 60	Beech 1900	4,000 x 75	Bring up to state standards.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-49 Kaltag Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-50 Nulato Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-51 Koyukuk Airport

3.6.3 The Hub Airport at Galena

The Edward G. Pitka Sr. Airport at Galena serves as a hub mainly for mail, although there is daily passenger service to Anchorage. There are several daily flights to Fairbanks. It is a primary airport with just under 10,000 enplanements per year. Before the military base closed in the early 1990s, annual enplanements exceeded 10,000. As a mail hub, it receives over 1,700 tons of mail and about 135 tons of airfreight each year. The primary runway is 7,254 by 150 feet with Instrument Landing System (ILS) Precision Instrument Approach on Runway 25. The airport averages about 230 daily operations.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-52 Edward G. Pitka Sr. Airport, Galena

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-53 Nenana Airport

3.6.4 The Airport at Nenana

This subregion includes the airport at Nenana. This airport serves general aviation with 15 based aircraft and 115 operations a day. It is not part of any air route serving other cities. The community is located very close to the Parks Highway, so receives its fourth-class mail by truck rather than by air. The runway is 5,000 by 100 feet. There is a parallel floatplane runway as well. The Nenana airport meets the need to 2025.

3.6.5 Action Plan Summary

There is no need for expansion or increased capability for airports at Anaktuvuk Pass, Allakaket, Bettles, Galena, Hughes, Kaltag, Nenana, Nulato, Rampart, Ruby, or Tanana. The remaining airports and recommendations for improvements are given in Table 3-37.

Table 3-37 Middle Yukon River Basin Subregion Recommended Runway Improvements

Community	Priority	Present Runway	Needed Runway	Remarks
Huslia	Medium	3,000 x 60	4,000 x 75	Present runway mostly adequate for FAR Part 135 service. Runway eventually a candidate for increased length.
Koyukuk	Medium	3,000 x 60	4,000 x 75	Bring up to state standards.
Minto	Low	2,000 x 65	3,400 x 60	Since it is on the road, the state standard of 3,400 feet is sufficient.
Manley Hot Springs	Low	2,875 x 40	3,400 x 60	Since it is on the road, the state standard of 3,400 feet is sufficient.

3.7 Seward Peninsula / Norton Sound Subregion

3.7.1 Demand Forecast

The demand forecast of enplanements and mail for the Seward Peninsula and Norton Sound subregion is presented in Table 3-38. Nome is the subregional hub. Unalakleet serves as a secondary hub for mail to four communities in the southern portion of Norton Sound. Gambell and Savoonga, the largest outlying communities in this subregion, are located on St. Lawrence Island. The fact that Unalakleet serves as a hub for mail while Nome is the hub for passengers makes Routes 16 and 17 from Nome to Unalakleet and the communities on Norton Sound difficult to analyze.

Figure 3-54 provides a view of the way demand is forecast from past data. The chart shows two separate forecasts, for the communities and for the hubs. As we have seen in most of the areas of the Northwest, there has been a decrease in the number of flights. A forecast based only on the last four years would show little or no growth due to the stagnant or declining economic situation. However, the communities continue to grow in population at a rate of one to two percent per year and a return to the normal growth rate is assumed.

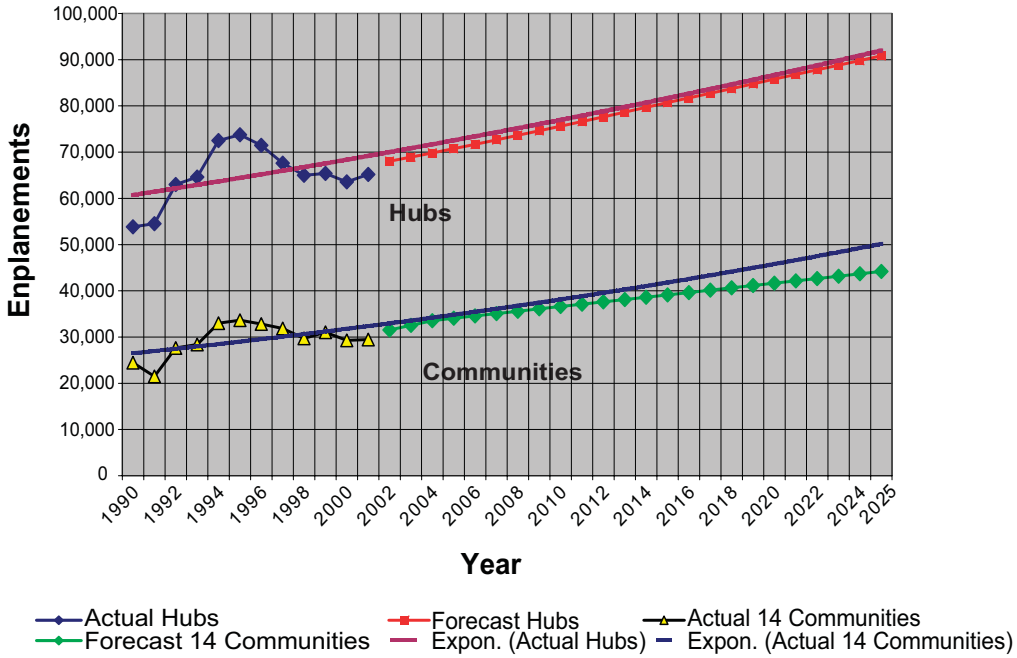


Figure 3-54 Enplanement Forecast for Hubs and Communities in the Seward Peninsula/Norton Sound Subregion

Table 3-38 Seward Peninsula/Norton Sound Subregion Forecast of Population, Enplanements, and Mail

Community	1995			2005			2015			2025		
	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)	Population	Enplanements	Mail (tons)
Brevig Mission	264	1,996	194	297	2,225	300	345	2,684	384	394	3,192	479
Elim	280	2,866	258	337	2,597	358	391	3,126	460	447	3,710	575
Gambell	623	3,989	545	698	4,343	679	811	5,414	886	926	6,620	1,124
Golovin	148	2,344	131	155	1,804	177	180	2,120	224	206	2,464	276
Koyuk	258	2,735	294	320	2,516	322	371	3,022	413	424	3,581	517
Savoonga	603	3,970	491	692	4,304	698	804	5,362	911	918	6,555	1,155
Shaktoolik	204	1,962	251	247	2,190	282	287	2,608	359	328	3,066	447
Shishmaref	537	3,724	580	605	3,786	676	702	4,692	879	802	5,710	1,112
Saint Michael	324	2,006	339	396	2,887	449	460	3,495	579	525	4,170	727
Stebbins	477	2,370	405	588	3,694	553	684	4,573	719	781	5,560	909
Teller	272	1,430	272	288	1,457	297	335	1,828	381	383	2,245	475
Wales	174	1,664	235	164	1,838	214	190	2,163	270	217	2,517	333
White Mountain	205	2,570	228	218	2,065	233	254	2,449	296	290	2,870	367
Diomede (Inalik)[a]	235	n/a	186	180	n/a	201	207	n/a	252	232	n/a	307
Communities Served by Nome	**3,341**	**24,553**	**3,120**	**3,633**	**24,419**	**3,832**	**4,219**	**29,838**	**4,942**	**4,814**	**35,883**	**6,202**
Nome	3,507	63,966	5,160	3,771	64,968	5,467	4,380	79,297	6,351	5,003	96,828	7,254
Nome Mail In		63,966	8,280			9,300			11,293			13,456
Communities Served by Unalakleet	**1,263**	**9,073**	**1,289**	**1,551**	**11,287**	**1,606**	**1,802**	**13,698**	**2,071**	**2,058**	**16,377**	**2,599**
Unalakleet	754	9,789	928	804	10,624	971	934	13,031	1,127	1,066	15,942	1,301
Unalakleet Mail In			2,217			2,578			3,198			3,900
Total for Subregion	**8,865**	**107,381**	**10,497**	**9,759**	**111,298**	**11,877**	**11,335**	**135,865**	**14,491**	**12,941**	**165,029**	**17,356**

a. Diomede is served primarily by helicopter which includes the transport of mail from Nome.
n/a – data not available

3.7.2 Route Structure and Analysis

Figure 3-55 presents the structure of the six routes in this subregion. The first four (Routes 12 through 15) on the Seward Peninsula and St. Lawrence Island are straightforward and reflect the usual round robin routing. The two on Norton Sound (Routes 16 and 17) are more complex because the bulk of the mail for the four communities comes through Unalakleet while passengers generally come through Nome. There is daily air service from Unalakleet to Anchorage. In 2000, 2,689 Unalakleet enplanements were bound for Anchorage, 30 percent for Nome, with the

remainder bound for Stebbins, Saint Michael, Shaktoolik, and Koyuk. The route structure in the analysis does not mirror perfectly all the flights in this area (for example, flights from Shishmaref to Savoonga are not included). Some flights from Unalakleet are part of a round robin to Nome, some flights serve Shaktoolik and Koyuk, while others serve Stebbins and Saint Michael mostly for mail. The mail for Stebbins or Saint Michael can go by road from one to the other, but they are treated as independent airports for the purposes of the forecast.

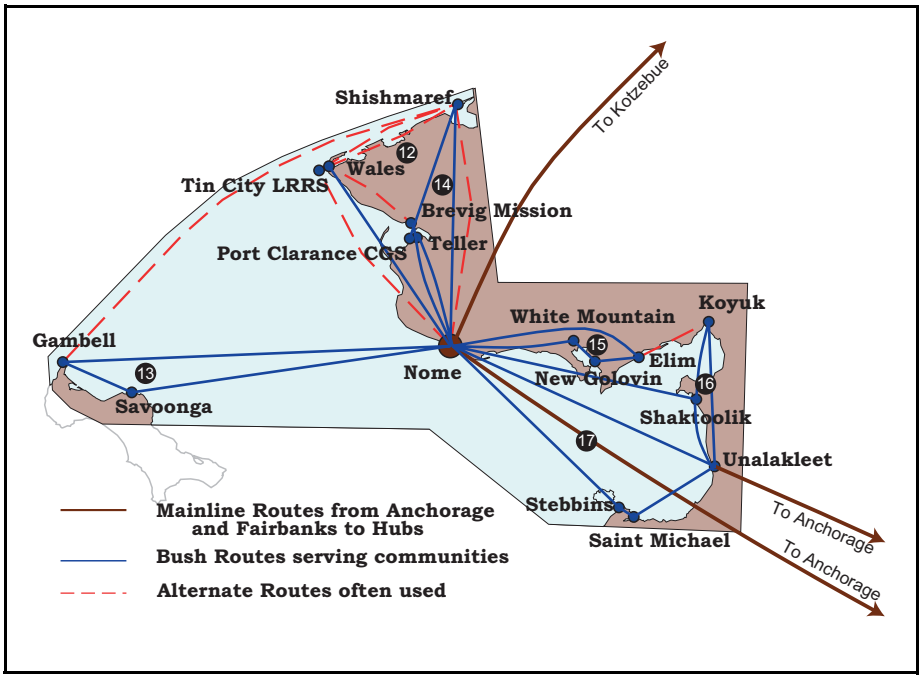


Figure 3-55 Air Carrier Route Structure for Seward Peninsula/Norton Sound Subregion

Service Analysis for Route 12

Although the present FAR Part 135 air service from Nome to Shishmaref and Wales using Cessna Caravan 208s is somewhat more than is currently needed, air travel on this route is forecast to grow considerably. This growth calls for FAR Part 121 service using Beech 1900s or other 121 aircraft by 2025 (Table 3-39). As Table 3-40 indicates, the runways for these airports are very adequate, though a study of runway widening for wind coverage at Wales could be undertaken.

Table 3-39 Route 12 Service Performance

Nome-Shishmaref-Wales Round-trip Distance: 292 miles	Current Service Without Mail	Forecast with Passengers & Mail			
		2005	2015	2025	2025 (FAR Part 121)
Number of Flights on Weekdays / Saturday / Sunday	6/6/3	6/6/3	8/7/3	8/7/3	6/6/2
Number of Annual Scheduled Flights (50-week year)	1,950	1,950	2,500	2,500	1900 (1900s)
Number of Non-Scheduled Flights Added to Fulfill Service	0	2	9	33	13 (208s)
Number of Passengers Enplaned	8,841	10,239	11,514	13,014	12,914
% Passengers Accommodated on Scheduled Flights	100%	100%	100%	100%	100%
Mail Delivered (tons)	0	679	702	921	860
% Mail Delivered on Scheduled Passenger Flights	0	99%	98%	95%	98%

Table 3-40 Route 12 Runway Dimension Requirements

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Shishmaref	5,000 x 70	Beech 1900	4,000 x 75	Meets need to 2025.
Wales	4,000 x 75	Beech 1900	4,000 x 75	Study needed on runway widening for wind coverage.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-56 Shishmaref Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-57 Wales Airport

Service Analysis for Route 13

The level of air traffic to Gambell and Savoonga on St. Lawrence Island will soon support FAR Part 121 service as shown in the last column of Table 3-41. Fortunately, as Table 3-42 shows, the runways are already capable of handling that type of service, though high crosswinds at certain times of the year create potential safety hazards at both airports. Thus, a study on the need for crosswind runways is appropriate.

Table 3-41 Route 13 Service Performance

Nome-Gambell-Savoonga Round-trip Distance: 400 Miles	Current Service Without Mail	Forecast with Passengers & Mail			
		2005	2015	2025	2025 (FAR Part 121)
Number of Flights on Weekdays / Saturday / Sunday	6/6/3	7/6/3	8/7/3	8/7/3	6/6/2
Number of Annual Scheduled Flights (50-week year)	1,950	2,200	2,500	2,500	1,900 (1900s)
Number of Non-Scheduled Flights Added to Fulfill Service	0	13	38	26	44 (208s)
Number of Passengers Enplaned	13,560	15,971	18,188	20,626	20,693
% Passengers Accommodated on Scheduled Flights	100%	100%	100%	100%	100%
Mail Delivered (tons)	0	841	917	1,111	1,156
% Mail Delivered on Scheduled Passenger Flights	N/A	98%	98%	95%	98%

Table 3-42 Route 13 Runway Dimension Requirements

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Gambell	4,500 x 96	Beech 1900	4,000 x 75	Meets need to 2025. Study needed for crosswind runway.
Savoonga	4,402 x 100	Beech 1900	4,000 x 75	Meets need to 2025. Study needed for crosswind runway.

http://www.airnav.com/airport/PAGM

Figure 3-58 Gambell Airport

Service Analysis for Route 14

Data in Table 3-43 indicate that only FAR Part 135 service on the route from Nome to Teller and Brevig Mission is needed to fulfill projected passenger and mail demand. Even so, the 3,000-foot runways at Teller and Brevig Mission are marginal and should be brought up to state standards of 3,400 feet (though 3,700 feet would be preferable to accommodate the Piper Navajos that typically fly this route). The Brevig Mission airport needs additional width on the primary runway and added length on the crosswind runway to improve safety of aircraft landing in heavy crosswinds.

Table 3-43 Route 14 Service Performance

Nome-Teller-Brevig Mission Round-trip Distance: 128 Miles	Current Service		Forecast with Passengers & Mail	
	Without Mail	With Mail	2015	2025
Number of Flights on Weekdays / Saturday / Sunday	4/4/2	4/4/2	5/5/3	5/5/3
Number of Annual Scheduled Flights (50-week year)	1,300	1,300	1,650	1,650
Number of Non-Scheduled Flights Added to Fulfill Service	0	10	4	7
Number of Passengers Enplaned	3,407	3,873	5,598	6,311
% Passengers Accommodated on Scheduled Flights	100%	100%	100%	100%
Mail Delivered (tons)	0	378	433	498
% Mail Delivered on Scheduled Passenger Flights	0	99%	99%	99%

Table 3-44 Route 14 Runway Dimension Requirements

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Teller	3,000 x 60	Cessna 208	3,400 x 60	Bring up to state standards. Road connection not maintained in winter.
Brevig Mission:				
Primary	3,000 x 100	Beech 1900	4,000 x 100	
Crosswind	2,110 x 75	Beech 1900	3,200 x 75	Needs extra length and width for crosswinds.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-59 Teller Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-60 Brevig Mission Airport

Service Analysis for Route 15

This route serves White Mountain, Elim, and Golovin along the southern coast of the Seward Peninsula. One or two flights per day also include Koyuk. Table 3-45

indicates that the present FAR Part 135 service will handle the air traffic demand generated by passengers and mail for some time. The last column shows the forecast for 2025 when enplanements from Koyuk are added to Elim's enplanements. This is forecast at about 500 enplanements.

Table 3-45 Route 15 Service Performance

Nome-White Mountain-Elim-Golovin (and Koyuk sometimes) Round-trip Distance: 195 Miles (+ 80 miles to Koyuk)	Current Service		Forecast with Passengers & Mail		
	Without Mail	With Mail	2015	2025	2025[a]
Number of Flights on Weekdays / Saturday / Sunday	6/5/3	6/5/3	6/5/3	6/5/3	6/5/3
Number of Annual Scheduled Flights (50-week year)	1,900	1,900	1,900	1,900	1,900
Number of Non-Scheduled Flights Added to Fulfill Service	0	6	8	20	27
Number of Passengers Enplaned	9,913	11,768	14,671	16,674	17,425
% Passengers Accommodated on Scheduled Flights	100%	100%	100%	100%	100%
Mail Delivered (tons)	0	518	595	719	702
% Mail Delivered on Scheduled Passenger Flights	0	99%	98%	96%	95%

a. For the 2025 forecast, enplanements from Koyuk are added to Elim's enplanements

Table 3-46 Route 15 Runway Dimension Requirements

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
White Mountain	3,000 x 60	Beech 1900	4,000 x 75	Evaluate need to extend runway not just to 3,400 feet but also to 3,700 feet to accommodate the Piper Navajo; could extend to 4,000 feet at that time.
Golovin	4,000 x 75	Beech 1900	4,000 x 75	Meets need to 2025.
Elim	3,000 x 60	Beech 1900	4,000 x 75	Evaluate need to extend runway not just to 3,400 feet but also to 3,700 feet to accommodate the Piper Navajo; could extend to 4,000 feet at that time.

http://www.alaska.faa.gov/fai/airports2.htm

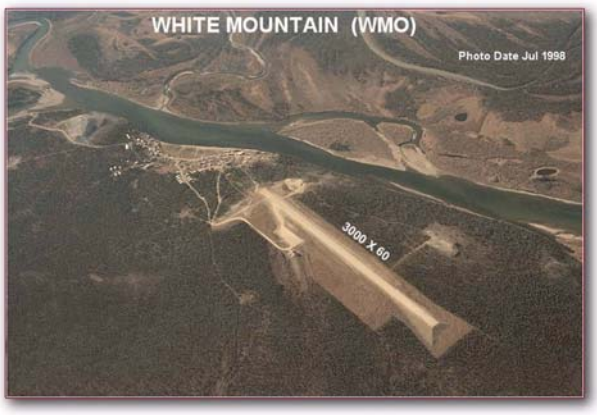


Figure 3-61 White Mountain Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-62 Elim Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-63 New Golovin Airport

Service Analysis for Route 16

FAR Part 135 service will suffice for the near future for the flight to Unalakleet, Shaktoolik, and Koyuk. This route is difficult to analyze because Unalakleet is a hub for mail, and has direct air service of one flight per day to Anchorage so not all of the passengers come through Nome. The data used in the analysis for this route and Route 17 take these anomalies into account. The results are presented in Tables 3-47 and 3-48. The Unalakleet runway is adequate to handle the current and projected level of service.

Table 3-47 Route 16 Service Performance

Nome-Unalakleet-Shaktoolik-Koyuk Round-trip Distance: 153 Miles Round-trip Distance including Nome: 393 miles	Current Service		Forecast with Passengers & Mail	
	Without Mail	With Mail	2015	2025
Number of Flights on Weekdays / Saturday / Sunday	5/4/3	5/4/3	5/4/3	5/4/3
Number of Annual Scheduled Flights (50-week year)	1,600	1,600	1,600	1,600
Number of Non-Scheduled Flights Added to Fulfill Service	0	4	9	11
Number of Passengers Enplaned	9,785	10,221	12,377	14,248
% Passengers Accommodated on Scheduled Flights	100%	100%	100%	100%
Mail Delivered (tons)	0	354	463	494
% Mail Delivered on Scheduled Passenger Flights	0	99%	98%	98%

Table 3-48 Route 16 Runway Dimension Requirements

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Koyuk	3,000 x 60	Beech 1900	4,000 x 75	Bring up to state standards.
Shaktoolik	4,000 x 75	Beech 1900	4,000 x 75	Meets need to 2025.
Unalakleet:				
Primary	6,004 x 150	Jet	5,000 x 150	Meets need to 2025.
Crosswind	2,000 x 80	Cessna 208	2,720 x 60 (80% of 3,400)[a]	Bring up to state standards for a general aviation crosswind, but as a low priority.

a. State standard for crosswind runway length is 80 percent of 3,400-foot primary runway length.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-64 Koyuk Airport

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-65 Shaktoolik Airport

Service Analysis for Route 17

This route, Nome to Unalakleet to Saint Michael to Stebbins, has the same anomaly as Route 16. Unalakleet is a mail hub and has direct service to Anchorage. The number of enplanements was adjusted to account for that, and the number of enplanements was reduced to remove those counted in Route 16. It is clear from Table 3-49 that even with those adjustments, FAR Part 121 service is needed by 2025. There is a nine-mile road between Saint Michael and Stebbins. Transporting mail from Saint Michael to Stebbins on the road could make upgrading the Stebbins airport unnecessary, even past 2025 (see Table 3-50).

Table 3-49 Route 17 Service Performance

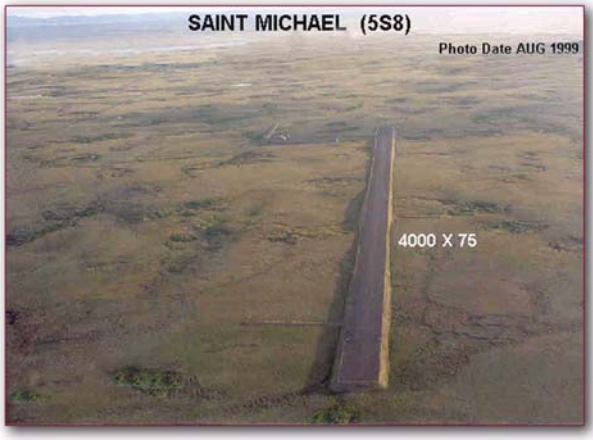
Nome-Unalakleet-Saint Michael-Stebbins Round-trip Distance: 110 Miles Round trip Distance including Nome: 325 miles	Current Service		Forecast with Passengers & Mail		
	Without Mail	With Mail	2015	2025	2025 (FAR Part 121)
Number of Flights on Weekdays / Saturday / Sunday	5/4/2	5/4/2	7/5/2	8/6/3	6/4/2
Number of Annual Scheduled Flights (50-week year)	1,550	1,550	2,100	2,450	1,800
Number of Non-Scheduled Flights Added to Fulfill Service	0	31	22	13	5
Number of Passengers Enplaned	15,907	15,930	19,469	22,061	22,027
% Passengers Accommodated on Scheduled Flights	100%	99%	100%	100%	99%
Mail Delivered (tons)	0	636	819	868	910
% Mail Delivered on Scheduled Passenger Flights	0	94%	97%	98%	97%

Table 3-50 Route 17 Runway Dimension Requirements

Airport	Present Runway (feet)	Design Aircraft	Needed Runway (feet)	Remarks
Stebbins	3,000 x 60	Beech 1900	4,000 x 75	When brought up to state standards of 3,400 feet, consider extending to 4,000, but road connection to Saint Michael reduces the urgency.
Saint Michael	4,000 x 75	Beech 1900	4,000 x 75	Meets need to 2025.
Unalakleet (see Table 3-48)	6,004 x 150	Jet	5,000 x 150	Meets need to 2025.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-66 Stebbins Airport

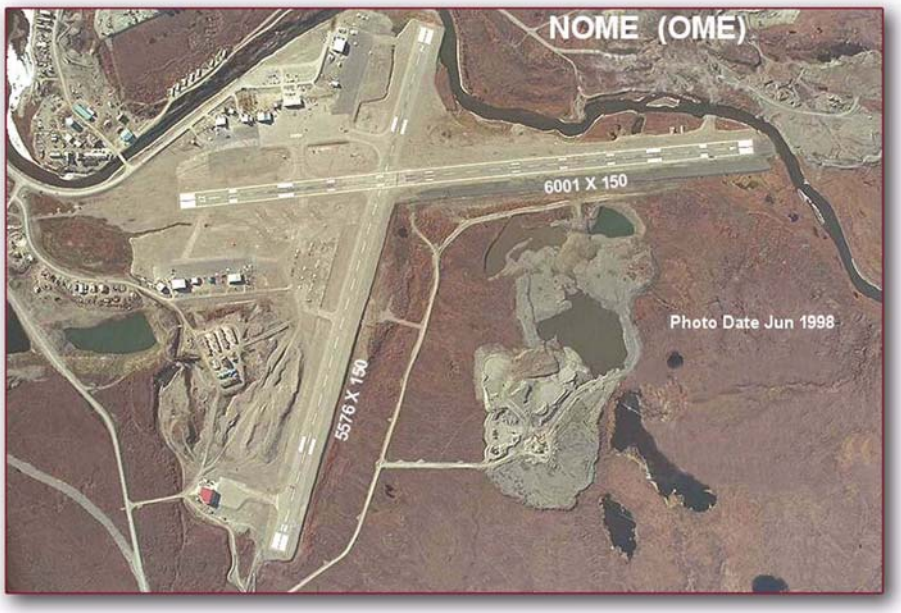


http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-67 Saint Michael Airport

3.7.3 The Hub Airport at Nome

The Nome airport serves as the major hub for the Seward Peninsula / Norton Sound subregion. There are several daily flights to Anchorage. It is a primary airport with over 25,000 enplanements per year. As a mail hub, it receives almost 20 million pounds of mail and over 400 tons of airfreight a year. The primary runway, 6,000 by 150 feet, is situated east-west. It has an ILS Precision Instrument Approach on Runway 27. Wind conditions have dictated a crosswind Runway 2–20. It has a non-precision instrument approach using Variable Omni Range (VOR) or Global Positioning System (GPS). The airport averages about 80 operations a day. The airport is located in a depression; fog often is a problem.



http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-68 Nome Airport

An upcoming master plan for the airport will evaluate expansion issues at the Nome Airport, including potential relocation. The Snake River blocks the extension of the main 6,000-foot runway on both ends. DOT/PF is working on an Airport Layout Plan update that shows relocation of the Snake River and a 10,000-foot runway. The crosswind runway would also be extended to 8,000 feet. Preliminary consultations with resource agencies indicate there would be some environmental benefits to relocating the river, although this option has raised concerns with some Nome citizens. A general aviation expansion project at the airport is scheduled in FAA's Aviation Improvement Program sometime in the next decade and, once constructed, DOT/PF will close down Nome City Field, whose use creates potential airspace conflicts with Runway 27 traffic at Nome Airport. Future lease lots are needed.

3.7.4 The Mail Hub Airport at Unalakleet

Primarily a mail hub, the airport at Unalakleet serves the large DC-6s and small jets that deliver about 4 million pounds of mail a year plus airfreight. There is one passenger flight per day to Anchorage (SAAB 340 or Fairchild Metro), none to Fairbanks, and six small general aviation aircraft to Nome. Altogether, Unalakleet handles about 6,000 enplanements a year. The primary runway (14) is 6,004 by 150 feet. It is gravel with ILS Localizer/DME (Distance Measuring Equipment) Instrument Approach on Runway 14. Very short at 2,000 feet, the crosswind Runway 8–26 needs to be lengthened to serve general aviation traffic.

http://www.alaska.faa.gov/fai/airports2.htm

Figure 3-69 Unalakleet Airport

3.7.5 Action Plan Summary

There is no need for expansion or increased capability recommended for airports at Golovin, Shaktoolik, Shishmaref, Wales, Gambell, Savoonga, nor for the primary runway at Unalakleet. Recommendations for the remaining airports are presented in Table 3-51.

Table 3-51 Seward Peninsula/Norton Sound Subregion Recommended Runway Improvements

Airport	Priority	Present Runway	Needed Runway	Remarks
Brevig Mission: Primary	High	3,000 x 100	4,000 x 100	
Crosswind	High	2,110 x 75	3,200 x 75	Needs extra length and width for crosswinds.
White Mountain	Medium	3,000 x 60	4,000 x 75	Evaluate need to extend runway not just to 3,400 feet but also to 3,700 feet to accommodate the Piper Navajo; could extend to 4,000 feet at that time.
Elim	Medium	3,000 x 60	4,000 x 75	Evaluate need to extend runway not just to 3,400 feet but also to 3,700 feet to accommodate the Piper Navajo; could extend to 4,000 feet at that time.
Koyuk	Medium	3,000 x 60	4,000 x 75	Bring up to state standards.
Stebbins	Low	3,000 x 60	4,000 x 75	When brought up to state standards of 3,400 feet, consider extending to 4,000. Road from Saint Michael reduces the urgency.
Teller	Low	3,000 x 60	3,400 x 60	Bring up to state standards. The road connection to Nome is not maintained in winter.
Unalakleet Crosswind	Low	2,000 x 80	2,720 x 60 (80% of 3,400)	Bring up to state standards for a general aviation crosswind, but as a low priority.

3.8 Summary of Aviation Recommendations

For priorities in making airport improvements, refer to the subregional recommendations:

- Table 3-21 - Northwest Arctic Borough Subregion Recommended Runway Improvements
- Table 3-26 - North Slope Borough Subregion Recommended Runway Improvements
- Table 3-37 - Middle Yukon River Basin Subregion Recommended Runway Improvements
- Table 3-51 - Seward Peninsula/ Norton Sound Subregion Recommended Runway Improvements

3.8.1 Funding Airport Improvements

The FAA *National Plan of Integrated Airport Systems, 2001 to 2005* (NPIAS, 2000) is used by federal and state aviation officials to help guide funding decisions on airport improvements. The NPIAS assigns each public-use airport a rating based on the number of enplanements, as shown in Table 3-52.

The NPIAS is updated every five years. The NPIAS Primary Airports in Northwest Alaska (those with 10,000 or more enplanements) are given in Table 3-53. If the forecast for enplanements holds (and the criteria stay constant), there will be two more primary airports in Northwest Alaska by 2020 (Unalakleet and Selawik). Unalakleet may actually qualify as a Primary Airport in 2015.

The NPIAS commercial airports (those with 2,500 or more enplanements) are given in Table 3-54.

Primary and commercial airports are eligible for various levels of federal funding. Most of the funds are used for the more active airports (10,000 enplanements and higher). The FAA funding formula does not take into account either construction difficulties or the fact that airports are primary transportation links for both people and most freight movement in Northwest Alaska.

Based on the enplanement forecasts, the airports in Table 3-55 should be added to future versions of the NPIAS as commercial airports.

Table 3-52 Requirements for NPIAS Ratings

NPIAS[a] Designation	Designation Abbreviation	Annual Enplanements in 2020
Commercial Service – Primary	PR	≥10,000
Commercial Service – Non-primary	CM	≥2,500
Reliever Airport	RL	Functional
General Aviation Airport	GA	< 2,500

a. NPIAS – National Plan of Integrated Airport Systems

Table 3-53 Primary Airports in Northwest Alaska in the NPIAS

City	Airport ID	Current Role	Airport Category in 2005	Forecast Enplanements for 2005	2001-2005 Development Cost	Airport Category in 2020	Forecast Enplanements for 2020
Kotzebue	OTZ	PR	PR	56,017	$62,986,667	PR	
Nome	OME	PR	PR	53,133	$29,600,000	PR	74,165
Barrow	BRW	PR	PR	37,254	$16,512,000	PR	
Galena	GAL	PR	PR	11,693	$ 3,733,334	PR	13,185
Deadhorse	SCC	PR	PR	10,582	$ 9,487,999	PR	12,000
Unalakleet	UNK	CM	CM	8,413	$15,999,999	PR	11,127
Selawik	WLK	CM	CM	7,710	$ 4,800,001	PR	10,241

Table 3-54 Commercial Airports in Northwest Alaska in the NPIAS (Page 1 of 2)

City	Airport ID	Current Category	Airport Category in 2005	Forecast Enplanements for 2005	2001-2005 Development Cost	Forecast Enplanements for 2020
Unalakleet	UNK	CM	CM	7,126	$15,999,999	9,197
Tanana	TAL	CM	CM	4,209	$ 4,800,000	3,864
Point Hope	PHO	CM	CM	4,198	$ 5,866,667	5,439
Selawik	WLK	CM	CM	4,083	$ 4,800,001	7,710
Bettles	BTT	CM	CM	4,000	$10,133,334	2,089
Shishmaref	SHH	CM	CM	3,966	$ 7,560,000	4,015
Wainwright	AWI	CM	CM	3,883	$ 5,439,999	4,203
Noorvik	ORV	CM	CM	3,861	$ 6,720,000	6,147
Gambell	GAM	CM	CM	3,856	0	4,307
Savoonga	SVA	CM	CM	3,789	$ 3,200,000	4,515
Buckland	BVK	CM	CM	3,253	$ 3,200,000	3,230
Nulato	NUL	CM	CM	3156	$ 2,133,333	3,561
Atqasuk	ATK	CM	CM	3000	$ 213,333	2,632
Kiana	IAN	CM	CM	3,000	0	3,311
Elim	ELI	CM	CM	2,900	$ 5,000,000	3,091
Huslia	HSL	CM	CM	2,829	$ 480,000	3,032
Noatak	WTK	CM	CM	2,550	$ 3,199,999	3,796
Kivalina	KVL	CM	CM	2,535	$14,600,000	3,034
Anaktuvuk Pass	AKP	CM	CM	2,260	0	3,761

Table 3-54 Commercial Airports in Northwest Alaska in the NPIAS (Page 2 of 2)

City	Airport ID	Current Category	Airport Category in 2005	Forecast Enplanements for 2005	2001-2005 Development Cost	Forecast Enplanements for 2020
The following should be Commercial Service Non-Primary (CM) in 2001 to 2005 NPIAS but are not mentioned:						
Nuiqsut	NUI	GA			$1,706,667	3,601
Kaktovik[a]	BTI	GA			$15,146,667	2,916
Stebbins	WBB	GA			$5,866,667	2,910
Koyuk	KKA	GA			$7,466,667	2,727
Point Lay[b]	PIZ	GA			$12,426,666	2,708
Ambler	ABL	GA			$5,866,667	2,689

a. Also airport in support of Barter Island LRRS.
b. Also airport in support of the DEW line.
Source: National Plan of Integrated Airport Systems, Federal Aviation Administration, 2000.

Table 3-55 Suggested Additions as Commercial Airports to Future NPIAS

Suggested Additions to NPIAS	Enplanements Forecast
2006 to 2010 NPIAS	**Forecast for 2010**
Nuiqsut	3,952
Kaktovik	3,177
Stebbins	3,127
Koyuk	2,930
Point Lay	2,943
Ambler	2,967
Kaltag	2,726
2011 to 2015 NPIAS	**Forecast for 2015**
Shungnak	2,686
Saint Michael	2,641
2016 to 2020 NPIAS	**Forecast for 2020**
White Mountain	2,631
Allakaket	2,533

Table 3-56 contains the recommendations for airport improvements. There are very few airports in Northwest Alaska that cannot adequately accommodate the aircraft required to carry mail and passengers. Already many airports in this region have 4,000-foot runways, the length needed to accommodate twin-engine aircraft. With the new federal requirement to fly both passengers and mail on the same plane (which favors the use of twin-engine aircraft), it is prudent to upgrade virtually all community airports in this region to that length. For a few airports in smaller communities, the current state standard of 3,400-foot runways (or 3,700-foot runways to better accommodate the Piper Navajo) will suffice to handle projected passenger and mail traffic through 2025.

Table 3-56 Overall Airport Plan (including Safety Areas) (Page 1 of 4)

FAR Part	Capability to Fly Fuel	Route Number	Community Runway	Present Runway	Safety Area Meet Existing Standards	Design Runway	Needed Safety Area[a]	Fuel Delivery by Air	Approach Minimum (nautical miles)	Priority to 4,000 feet	Proposed	Date Needed
Northwest Arctic Borough												
135	Yes	1	Ambler Primary	3,000 x 60	Yes	A-I	B-II	Yes	>1	D	Occasional fuel delivery is the major reason for runway length of 4,000 feet.	2005
		1	Ambler Crosswind	2,400 x 60	Yes	A-I	B-II	No	>1	D	Crosswind runway essential for service during the fall.	2005
135	Yes	1	Kobuk	2,518 x 50	No	A-I	B-II	Yes	>1	D	Occasional fuel delivery is the major reason for runway length of 4,000 feet.	2005
135	Yes	1	Shungnak	4,000 x 60	Yes	B-I	B-II	Yes	>1		Meets need to 2025. Occasional fuel delivery does not require wider runway.	2005
135		2	Deering Primary	2,600 x 50	No	A-I	B-II	No	>1	B	Primary runway length will be brought up to 4,000 feet.	2002
		2	Deering Crosswind	2,080 x 60	No	A-I	B-II	No	>1		Crosswind runway is usually 80% of primary runway.	2002
135		2	Buckland	3,200 x 75	Yes	B-I	B-II	No	>1	D	Primary runway length meets need to 2025.	2010
121	Yes	3	Kiana	3,400 x 100	Yes	B-II	B-II	Yes	>1	A	Needs 4,000 x 100 foot runway as soon as possible.	2010
121	Yes	3	Noorvik	4,000 x 100	No	B-III	B-II	Yes	>1		Presently under construction.	
121		3	Selawik Primary	3,000 x 60	Yes	A-I	B-II	No	>1	A	Water at both ends of both runways requires relocation of airport. Heavy traffic suggests that this is a high priority.	Now
		3	Selawik Crosswind	2,870 x 60	Yes	A-I	B-II	No	>1	A	Water at both ends of both runways requires relocation of airport. Heavy traffic suggests that this is a high priority.	Now
121	Yes	4	Kivalina	3,000 x 60	Yes	A-I	B-II	Yes	>1	C	The airport runway extension will occur with relocation of community. Meanwhile, consider strengthening the taxiway; obtain permission from the FAA for special use.	
121	Yes	4	Noatak	4,000 x 60	Yes	A-I	B-II	Yes	>1	C	Meets need to 2025.	2005
121	Yes	4	Point Hope	4,000 x 75	No	B-II	B-II	Yes	>3/4	B	Meets need to 2025.	2006

Table 3-56 Overall Airport Plan (including Safety Areas) (Page 2 of 4)

FAR Part	Capability to Fly Fuel	Route Number	Community Runway	Present Runway	Safety Area Meet Existing Standards	Design Runway	Needed Safety Area[a]	Fuel Delivery by Air	Approach Minimum (nautical miles)	Priority to 4,000 feet	Proposed	Date Needed
North Slope Borough												
135	Yes	5	Atqasuk	4,370 x 110	Yes		B-II	No	>1		Meets need to 2025.	
135	Yes	5	Wainwright	4,494 x 90	Yes		B-II	No			Meets need to 2025.	
135	Yes	5	Point Lay	3,590 x 80	Yes		B-II	No			Two-engine, two-pilot aircraft are recommended to provide full service over the entire route, but this is a decision for North Slope Borough to make.	
121	Yes	6	Nuiqsut	4,343 x 90	Yes		B-II	No			Meets need to 2025.	
		6	Deadhorse	6,000 x 150	No	C-IV	C-IV	No	>1/2		Meets need to 2025.	
121	Yes	6	Barter Island /Kaktovik	4,820 x 100	Yes		B-II	No			Meets need to 2025.	
Middle Yukon River Basin												
121	Yes	7	Anaktuvuk Pass	4,800 x 100		B-III	B-III	No	I		Airport owned by North Slope Borough. Meets need to 2025.	
121	Yes	7	Allakaket	4,000 x 100	No	B-III	B-III	Yes	I		Meets need to 2025.	2005
121	Yes	7	Bettles	5,200 x 150	No	C-IV	B-III	Yes	>3/4		Meets need to 2025.	
135	Yes	8	Hughes	4,000 x 100	Yes	B-III	B-III	Yes	1	C	Adequate for FAR Part 135 service. Flooding limits use in the spring. This may necessitate moving runway.	
135	Yes	8	Huslia	4,000 x 75	No	B-III	B-III	Yes	1		Present runway mostly adequate for FAR Part 135 service. Runway eventually a candidate for increased length.	
135	Road	9a	Manley Hot Springs	2,875 x 30	No	A-I	B-II	No	1	E	Since it is on the road, the state standard of 3,400 feet is sufficient.	2005
135	Road	9a	Minto (New)	2,400 x 80	No	A-I	B-II	No	1	E	Since it is on the road, the state standard of 3,400 feet is sufficient.	2004
135	No	9b	Rampart	3,500 x 75	Yes	B-II	B-II	No	1	E	Meets need to 2025.	
		10	Galena	7,254 x 150				No			Meets need to 2025.	
121	No	10	Ruby	4,000 x 100	Yes	B-II	B-II	No	1		Meets need to 2025.	

Table 3-56 Overall Airport Plan (including Safety Areas) (Page 3 of 4)

FAR Part	Capability to Fly Fuel	Route Number	Community Runway	Present Runway	Safety Area Meet Existing Standards	Design Runway	Needed Safety Area[a]	Fuel Delivery by Air	Approach Minimum (nautical miles)	Priority to 4,000 feet	Proposed	Date Needed
121	No	10	Tanana	4,400 x 100	No	B-III	B-III	Yes	1		Meets need to 2025.	2004
135	Yes	11	Kaltag	3,900 x 100	Yes	B-II	B-IV	Yes	1		Meets need to 2025.	2007
135	Yes	11	Koyukuk	3,000 x 60	Yes	A-I	B-III	Yes	1	D	Bring up to state standards.	2002
135	Yes	11	Nulato	4,000 x 75	Yes	B-II	B-III	Yes	1		Meets need to 2025.	2010
Seward Peninsula / Norton Sound												
121	No	12	Wales	4,000 x 75	Yes	B-II	B-II	No	>1		Study needed on runway widening for wind coverage.	2005
	No	12	Shishmaref	5,000 x 75	Yes	B-II	B-II	No	>3/4		Meets need to 2025.	2006
121	Yes	13	Savoonga	4,400 x 100	Yes	B-II	B-II	Yes	>3/4		Meets need to 2025. Study need for crosswind runway.	2005
	Yes	13	Gambell	4,500 x 100	Yes	B-II	B-III	Yes	>3/4		Meets need to 2025. Study need for crosswind runway.	2010
135	No	14	Brevig Mission Primary	3,000 x 100	Yes	B-II	B-II	No	>1	D		2005
		14	Brevig Mission Crosswind	2,110 x 75	No	A-I	B-II	No	>1		Need extra length and width for crosswinds.	2005
	Road	14	Teller	3,000 x 60	Yes	A-I	B-II	No	>1	E	Bring up to state standards. Road connection not maintained in winter.	2005
135	No	15	White Mountain	3,000 x 60	Yes	A-I	B-II	No	>1	D	Evaluate need to extend runway not just to 3,400 feet but to 3,700 feet to accommodate the Piper Navajo. Could extend to 4,000 feet at that time.	2006
	No	15	Elim	3,000 x 60	Yes	A-I	B-II	No	>1	D	Evaluate need to extend runway not just to 3,400 feet but to 3,700 feet to accommodate the Piper Navajo. Could extend to 4,000 feet at that time.	2004
	No	15	Golovin Primary	4,000 x 75	Yes	B-II	B-II	No	>1		Meets need to 2025. Study need for crosswind runway.	
135	No	16	Koyuk	3,000 x 60	Yes	A-I	B-II	No	>1	D	Bring up to state standards.	2006
	No	16	Shaktoolik	4,000 x 75	Yes	B-II	B-II	No	>1		Meets need to 2025.	
121	No	17	Saint Michael	4,000 x 75	Yes	B-II	B-III	No	>1		Meets need to 2025.	2025

Table 3-56 Overall Airport Plan (including Safety Areas) (Page 4 of 4)

FAR Part	Capability to Fly Fuel	Route Number	Community Runway	Present Runway	Safety Area Meet Existing Standards	Design Runway	Needed Safety Area[a]	Fuel Delivery by Air	Approach Minimum (nautical miles)	Priority to 4,000 feet	Proposed	Date Needed
	Road	17	Stebbins	3,000 x 60	Yes	B-I	B-II	No	>1	D	When brought up to state standards of 3,400 feet, consider extending to 4,000 but road connection to Saint Michael reduces the urgency. Low priority.	2005
		Mail Hub	Unalakleet Primary	6,000 x 150	No	B-III	B-III	No	>3/4		Meets need to 2025.	
			Unalakleet Crosswind	1,900 x 75	Yes	B-II	B-II	No	>3/4		Bring up to state standards for a general aviation crosswind, but as a low priority.	
		Hub	Nome Primary	6,000 x 150	No	C-III	C-III	No	<3/4		Nothing needed; Meet Safety Area standards. Pave.	
			Nome Crosswind	5,576 x 150	No	C-III	C-III	No	<3/4		Nothing needed; Meet Safety Area standards. Pave.	

a. For all approaches greater than 3/4 mile: B-II Safety Areas are 150 feet wide with 300 feet overruns off each end.

Chapter 4. Ports, Harbors, & Shipping

Navigation improvements, harbors, and ports remain critical to the economic well-being and quality of life for the residents of Northwest Alaska. More than 90% of Alaska's population live within ten miles of a major navigable waterway and most goods arrive in Alaska through waterborne commerce.[1] Most communities in the study area depend on water transportation for freight and fuel delivery. However, due to ice conditions, waterborne deliveries to the area's communities are only possible during certain times of the year.

To the extent funding is available, demand for infrastructure improvements can generally be met over time. Airfields, roads, and winter trail-marking, for example, have funding sources available from federal transportation programs for improvements to infrastructure. Marine transportation has very limited federal support with very high economic thresholds. Where traditional federal programs can find economic viability and a federal interest, projects can be proposed by a financially capable public entity in the United States Army Corps of Engineers (USACE) Navigation Improvement Program. This program provides dredging and breakwater improvements. Barge landings and small boat harbor projects needed in the northwest and arctic are not supported by federal transportation construction programs because they lack economic viability to satisfy national criteria, and often do not include project elements of federal interest. DOT/PF's ability to address marine transportation needs are subject to state legislative appropriations. Thus, reliable and predictable funding programs are not in place at either the federal or state level to address marine needs.

Alaska DOT/PF

Figure 4-1 Yukon River

The marine operating environment is seasonal and tonnage volumes for each community are generally low. Traditional docks and loading equipment are almost non-existent. Barges unload directly to unimproved beaches or riverbanks using equipment that is carried along with the barge. Beach operations are weather- and tide-dependent, making it unpredictable and risky. River operations are water level-dependent requiring tremendous experience and skill to read the river, evaluate risks, and negotiate a constantly moving current. Varying water levels and

1. Alaska DOT/PF, *Sustaining and Developing Alaska's Ports and Harbors; A Statewide Proposal*, "Executive Summary," 1991, page 1.

occasional groundings that lead to lost days add to the challenges of river operations.

4.1 System Description

The Northwest area is relatively undeveloped without protective harbors. Vessel movements along the coast, rivers, and estuaries are dependent on local knowledge and excellent seamanship. With few exceptions, landing facilities at communities are unimproved riverbank or coastal sites convenient to the community. Boat landings are along riverbanks, in backwater sloughs, and coastal estuaries behind beach berms.

In highly developed areas, economic activity justifies private investment in transportation infrastructure. In developing areas, public construction often precedes private investment to help develop a system where private investment becomes feasible. Except for Nome and Kotzebue, there are no communities in the area that have developed harbors.

Although marine facilities are needed to allow fuller utilization of the region's resources, the need is not presently sufficient to warrant large public investments.

People in the communities and the marine operators have a realistic assessment of both the benefit and cost of marine infrastructure for the conditions they live and operate in. It is well understood by operators, communities, and agencies that adequately addressing the deficiencies of

Bowhead Transportation

Figure 4-2 Complement of Lightering Equipment used in Northwest Alaska

port and harbor facilities is inherently difficult and costly due to the area's geography, small population, low cargo volumes, seasonal access controlled by ice, and a relatively weak cash economy.

Long distances, small population concentrations, open coast, and shoal waters are characteristic of marine transportation in the Northwest area. The predominant vessels used are seasonal cargo barges, small landing craft, open deck scows, and outboard watercraft. Outboard skiffs are a common means of transportation for subsistence activity.

The region begins at Saint Michael Bay on the southern shore of Norton Sound where five months of open water are followed by seven months of ice extending across the Sound and the Bering Sea to the Asian continent. Access to individual communities is from Norton Sound, Kotzebue Sound, and Bering Strait with few geographic land features or natural harbors.

Most long haul ocean-going rigs originate in Puget Sound, Washington. Some of the voyages to the Northwest area come via Anchorage. Ocean-going tugs, similar to Crowley Maritime's Sea Robin Class tugboats (126' x 34' x 16.5', length, beam and draft respectively) towing panamax size (100' x 400') fuel or deck cargo barges, bring cargo into the region and, for the most part, return empty or very lightly loaded.

Typical lightering equipment (Figure 4-2) is a shallow-draft landing craft equipped with a 28' x 25' hydraulic bow ramp with a 50' x 185' flat deck cargo barge in tow and a complement of cargo equipment such as a 140,000-pound capacity crane, 60,000-pound hydraulic crane, three front-end loaders with forks (38,000-pound, 28,000-pound, and 14,000-pound), a Cat D6 bulldozer, and a Rough Terrain truck tractor with 45' flatbed trailer.[2] Outfitted with an additional 50-foot portable ramp, the vessel can deliver cargo to almost any dock or beach site.

4.1.1 River and Coastal Navigation

The federal government provides services necessary for safe navigation. Weather information, charting, and aids to navigation are all essential elements of a complete transportation system. These are functions appropriately relegated to the federal domain. The National Weather Service, Office of Coast Survey, and the United States Coast Guard are important supporting service providers.

National Weather Service Forecasts

National Weather Service forecasts for the seven marine forecast areas in the region are essential to safe navigation. The areas covered are:

9A	**Norton Sound from Sledge Island to Nunaktuk Island**
9B	**Dall Point to Wales, including Saint Lawrence Island waters**
10A	**Kotzebue Sound**
10B	**Wales to Cape Lisburne**
11A	**Cape Lisburne to Cape Halkett**
11B	**Cape Halkett to Demarcation Point**

2. Vessel specifications from Bowhead Transportation, http://www.bowhead.com

Forecasts by the National Weather Service include Sea Ice Analysis for the Western and Arctic Coastal Waters for the edge of new and young ice, the areas of open water, and ice-fast areas. These forecasts include the predicted edge of ice edges influenced by current weather systems.

Freight transfer at sea from ocean barge to lighter barge, then from lighter to beach, is a weather-dependent activity. Accurate wind speed, direction, and duration predictions are critical to safe and efficient operations. Diligent seamanship by operators, along with years of personal observation and experience, enable them to operate in unimaginable conditions on open coastlines.

Tides in the region are reported from eight stations; Saint Michael and Point Barrow are the harmonic stations in the area. Operating on incoming tides is preferred to avoid grounding and being beached through a full 24-hour tide cycle. Once on station, freight must be quickly unloaded and the lighter barge extracted from the beach before the tide begins falling.

Navigational aids, such as river and coastal buoys, are administered by the U.S. Coast Guard and maintained on a seasonal basis.

Excerpts from the United States Coast Pilot[3] offer a flavor of the challenges in navigating these waters and the approaches to communities.

Alaska DOT/PF

Figure 4-3 Beach at Wales

Wales. Anchorage off Wales is in depths of 10 fathoms 0.8 mile from the beach. A narrow naval restricted area extends nearly 4 miles due W from the beach midway between Wales and the light. (See 334.1330, chapter 2, for limits and regulations). Caution is advised to avoid being dragged N over the restricted area and to Prince of Wales Shoal by the non-tidal current which usually has a velocity of more than 1 knot.

Kotzebue. Deep-draft vessels approach Kotzebue as closely as possible and lighter their freight ashore. The usual anchorage for deep draft vessels is in depths of 5 to 6 fathoms 3 to 6 miles SW of Cape Blossom; protection is afforded from N and E winds. The trip by small boat from the anchorage to Kotzebue is about 15 miles and over many sandbars that are constantly shifting; local pilotage is advised.

Barrow. Medium-draft vessels should be able to round Point Barrow at a distance of 1 mile; 30-foot drafts should stay at least 3 miles off. Caution: A 1957 report places a 25-foot shoal 7 miles NE of Point Barrow;

3. United States Coast Pilot, Volume 9, *Pacific and Arctic Coast of Alaska: Cape Spencer to Beaufort Sea*, 2002, 20th Edition, pages 335 to 355.

this may indicate a possible NE extension of Point Barrow spit. If passage must be made E of Point Barrow, August is the best month for the attempt.

These descriptions reveal the stark reality that marine operators in the region are exposed to extreme conditions.

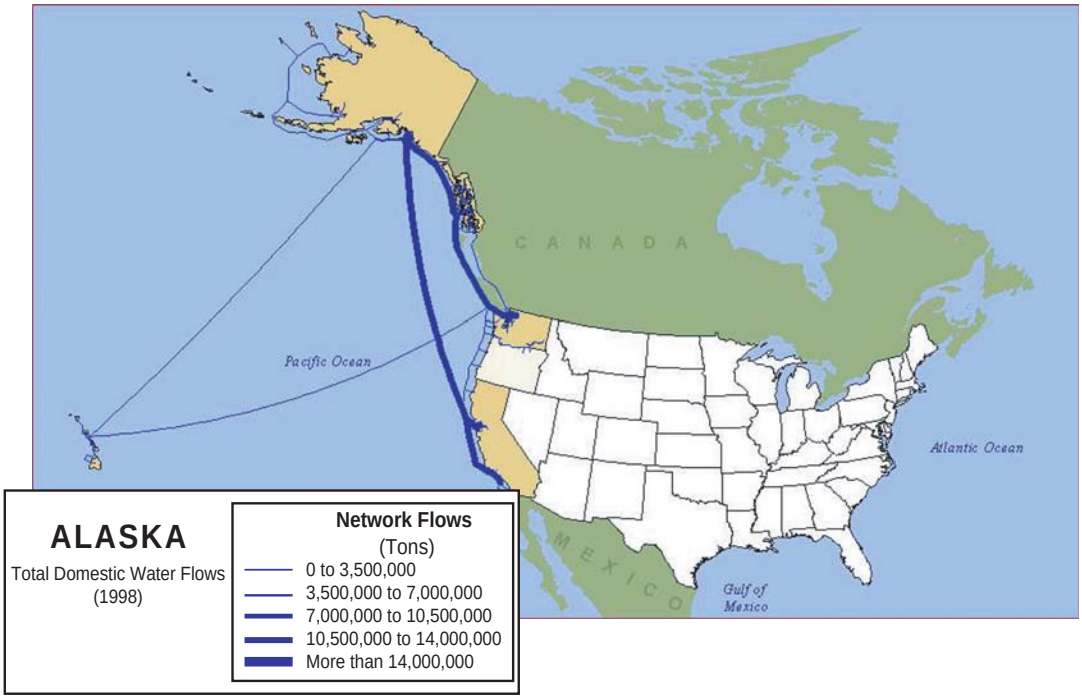
4.1.2 Coastal Freight and Fuel Movements

Under ideal conditions, water transportation promises to be the cheapest delivery mode, and since many of the communities in the region are adjacent to the coast or a river, water transportation has the advantage of being the least complex. However, in this region, goods shipped by water can have several transfer points, each adding cost. Most cargo originates in Seattle or Anchorage (Figure 4-4). Nome and Kotzebue serve as centers for government and commercial service and function as hubs for waterborne fuel and freight transportation.

Nome

The only moderately deep port in the region is Nome. The Port of Nome has a linear causeway with two docks distant from the onshore staging and consolidation activity. This is not optimum for efficiency of operations.

Reshipping from Nome can involve the delivery of the cargo to land-based staging areas and sorting into units for delivery to the receiving communities. Sorting the cargo at Nome involves several pieces of machinery, distant storage areas, and a number of personnel. This intermediate but necessary operation minimizes time, confusion, risk, and breakage when the lighter making the final delivery beaches itself to unload at the community



USDOT, Federal Highway Administration
http://ops.fhwa.dot.gov/freight/Waterway%20flows%20by%20State/AK.htm

Figure 4-4 Freight Flow to Alaska

destination. In general, this additional handling and lightering doubles the cost of transportation to outlying communities.

Ernest Schneider, Alaska Division of Tourism

Figure 4-5 Seismic Vessel

Freight data for Nome show the port received 48 tons in 1997 and 71 tons in 2000. Major product categories are gasoline and distillate fuel with sand and gravel being the biggest variable.[4] Reported ship movements for the port of Nome are 73 inbound and 73 outbound, and consist mostly of tugs and barges.

Fuel is delivered to Nome on barges, 100' x 400' with a 19' draft, towed by 126' tugs with 17' draft. Deck cargo barges are similar in size with slightly less draft. Smaller tugs and barges, and landing craft from 64' to 150' with drafts of 3.5' to 8', take freight from Nome to smaller coastal communities and communities in the region.[5]

The Port of Nome keeps records that indicate annual tonnage through the port in the early 1990s was 22,100 tons of freight and 28,970 tons of fuel (approximately 8.3 million gallons). Fuel reshipment data varies from zero to 2,100 tons shipped from shore tanks in the port area. The preferred method for reshipment of fuel is direct barge to lighter so the Nome data does not capture all the activity for fuel movements. Lighter transfers can occur at the dock in Nome or offshore nearer the receiving community. Of the 8 to 11 million gallons of fuel per year that comes into Nome (Table 4-1), approximately 600,000 to 800,000 gallons of it is reshipped to communities in the region by water.[6]

Gravel and quarry stone shipments for construction in western Alaska come from a high quality granite quarry in Nome. Annual quantities are highly varied, depending on construction activity in the region. Future exports of sand and gravel are within the 20-year timeframe of the plan.

Housing units are the other product frequently shipped to Nome via ocean barge, where they are transferred to lighters and shipped to the communities. The count on these is vague, but appears to be approximately 20 units per year.

4. U.S. Army Corps of Engineers, Water Resources Support Center, *Waterborne Commerce of the United States, Part 4, Waterways and Harbors*, "Pacific Coast, Alaska, and Hawaii," Calendar Year 1997.
5. *Navigation Improvements Final Interim Feasibility Report*, Nome, Alaska, Appendixes, July 1998, pages B-38 and 39.
6. Ibid. page B-26

Table 4-1 Port of Nome Cargo Activity 1998 – 2002

	1998	1999	2000	2001	2002	Annual Average
Causeway						
Dry Cargo (tons)	12,978	9,984	10,823	9,532	10,444	10,752
Fuel (gallons)	8,835,159	8,130,570	9,255,109	8,245,287	11,961,455	9,285,516
Gravel (tons)	29,739	78,131	47,992	9,122	2,839	33,565
Jetty						
Dry Cargo (tons)	4,020	3,497	4,859	5,675	4,821	4,575
Fuel (gallons)	3,312,476	3,181,474	2,316,941	2,614,479	2,570,742	2,799,222
Gravel (tons)	151	—	—	—	—	30
Compiled from Port of Nome records provided by Joy Hodges, Harbormaster						

Kotzebue

Fuel is also delivered to Kotzebue and then redistributed to ten outlying communities – Kivalina, Noatak, Noorvik, Kiana, Selawik, Deering, Buckland, Ambler, Shungnak, and Kobuk. To reduce draft, a Crowley Marine barge offloads 1.25 million gallons of its 5.25 million-gallon load bound for the Red Dog Mine north of Kotzebue. Due to the shallow depths of the water in the vicinity of the Crowley Marine-owned tank farm in Kotzebue, the fuel has to be lightered onto shore from 12-15 miles offshore. Depending on the weather, the time required for this lightering varies from 1.5 to 3 days. Lightering adds 16 to18 cents per gallon to the cost of fuel to Kotzebue. Estimates of quantities of annual fuel consumption in Kotzebue and the ten outlying communities are summarized in Table 4-2.

Table 4-2 Fuel Demand through Kotzebue

Annual Demand	Gallons
End use at Kotzebue	4.5 million
Electrical generation at Kotzebue	2.0 million
End use at communities via Kotzebue	1.75 million

Once fuel is in the Kotzebue tanks, it has to be redistributed to the outlying communities. This is done by barge whenever possible, but due to occasional navigation problems in the Noatak and Kobuk rivers, fuel is sometimes flown in. It is difficult to estimate the fuel transportation costs to the outlying communities. According to one source, there are 27 different fuel purchase agreements between entities within the outlying communities (stores, schools, etc.) and the supplier. Prices vary with volume, payment history, or any other factor that influences private-sector prices.[7]

7. *Trip Report,* Longtin and Geiger, USACE, Kotzebue Tank Farm Relocation Project, November 21 and 22, 2002.

There are two tugs and four barges permanently located in Kotzebue. The tugs are 85' long with a 2.5' draft. The barges, two each measuring 156' x 40' and 120' x 36', are wintered in the area. These operate out of the Kotzebue Lagoon, accessed from the sound through a 1.3-mile channel with a control depth of eight to ten feet. The lagoon is shallow, less than four feet deep.

Removing fuel and freight movements from lightering to direct discharge from ocean barge at any location offers the most potential for reducing the cost of living in the region. A recent study by the USACE to assess the fuel cost savings that would result from establishing a tank farm at Cape Blossom, 12 miles southeast of Kotzebue, found the project would not be economically feasible given the service area's current population and fuel consumption levels.

4.1.3 River Freight and Fuel Movements

Major rivers in the area used for transportation during the summer months are the Tanana, Yukon, and Koyukuk. Few communities along these rivers have improved barge or boat landings. The carriers maneuver the barges into position next to the riverbank as close to the community as possible. Since no dredging is done, these "landings" may be conveniently located or may be some distance from the community. The barge is normally moored to a tree on the bank while unloading and loading occur. Planks are extended from the barge deck to a solid point on the riverbank, and the fuel hoses are run to the nearby fuel tanks. Dry cargo carried on the deck is shuttled from the barge to the riverbanks with a forklift that precariously navigates the plank "gangway." Due to the instability of planks on dirt, occasionally the forklift or freight falls into the river.

Improved barge landings would allow barges to be moored to the landing while loading and unloading take place – saving tugboat fuel and expense – and would make cargo handling more efficient. The difficulty with an improved dock in most communities is that a prerequisite is a stable riverbank in the vicinity of the dock. This is often not possible without significant investment in riverbank erosion control.

Bowhead Transportation

Figure 4-6 ***Sam M. Taalak***

While the absence of landing facilities is an impediment to efficient movement of cargo between barges and land, in some communities the lack of a road between the landing and the community is an equal or greater problem. In the smaller communities, a small graveled freight landing area and a pioneer-level road connecting the landing with the community would be sufficient.

Tanana River

Nenana has a strong seasonal private sector economy as a hub for rail-to-river barge transportation services for the Interior. The Nenana Port Authority operates the dry cargo loading and unloading facilities, dock, bulkhead, and warehouse.

River freight service begins at Nenana on the Tanana River, and flows downriver to Tanana on the Yukon River, then up or down river to its destination. Yutana Barge Lines, a major private employer in Nenana, supplies communities along the Tanana and Yukon Rivers each summer with cargo and fuel.

The Tanana River is navigable by shallow draft, flat bottom vessels and barges. Dredging has been considered on the Tanana River to allow larger, more efficient barges, which draw more water to be used between Nenana and the downstream section of the Yukon. Past analysis of the economic feasibility of dredging the Tanana River conclude that the amount of freight shipped annually is not sufficient to justify the expense.

Yukon River

The Yukon River, navigable from the Canadian border to the Bering Sea, is a major transportation corridor in the interior. It cannot be entered or navigated by ocean-going vessels. Controlling depths are seven feet to Stevens Village and three to five feet upriver to Circle. Records of freight movements on the river are proprietary and unpublished; however, the level of freight movement is generally relative to the population of river communities.

Communities on the Yukon that depend on the river for transportation and the delivery of freight and fuel are Rampart, Tanana, Ruby, Galena, Koyukuk, Nulato, and Kaltag.

Yutana Barge Lines

Figure 4-7 Yutana Barge on Yukon River

Koyukuk River

The Koyukuk River is navigable by vessels drawing up to three feet to Allakaket during normally high river flow in spring and to Bettles during occasional higher flows. Normally, commercial barge traffic goes only to Hughes.

4.1.4 Shore Facilities

The Port of Nome is the only coastal community in the region that has a traditional port structure that ocean barges can moor against in a semi-protected basin to receive or transfer cargo. The Nome port consists of two-sheet pile docks on the east side of a 2,700-foot long causeway projecting into Norton Sound. The causeway shelters from the west and north and is fully exposed to the south and east. The outer dock has approximately 22 feet of water at the face, while the inner structure has only about 12 feet of water. Barges are sometimes partially unloaded

at the outer dock in fair weather, and then moved to the inner dock for further unloading or safety, if not forced offshore by inclement weather. Two stub causeways on each side of the entrance channel and a sharp left turn to the inner harbor shelters the small lightering fleet and the local fishing fleet from the violent storms that occur in Norton Sound.

The City of Nome is sponsoring a major navigation improvement project to their port to add a breakwater to improve the function and maintainability of the inner harbor, and create a protected operating environment for dock operations. Each dock will have an operating depth of 22 feet. The added protection will allow smaller lighters to operate concurrent with the larger barges in the outer harbor during inclement weather. The project benefits are estimated to be approximately $3.6 million per year, a significant element of which (approximately $2.4 million) is based on preserving the existing activity in the inner harbor facilities. Enhanced protection of the causeway docks provides annual benefit of approximately $1.2 million per year. The value to the community and the fishing industry at that port is apparent. Port expansion to handle bulk freight, including sand and gravel exports, is seen as a next stage of development for the port.

Nome has a small boat harbor for a fleet of commercial fishing boats and a viable commercial fishing industry consisting of crab, salmon and halibut. Subsistence is also a significant component of the total economic picture.

The only other customary coastal port facility is the sunken barges at Saint Michael.

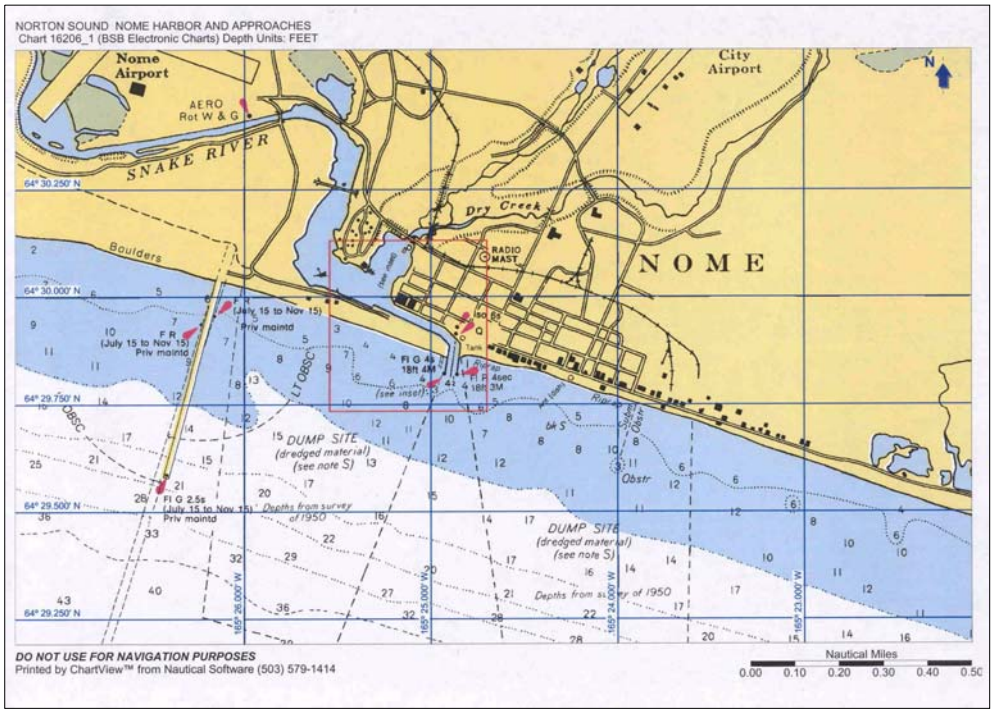
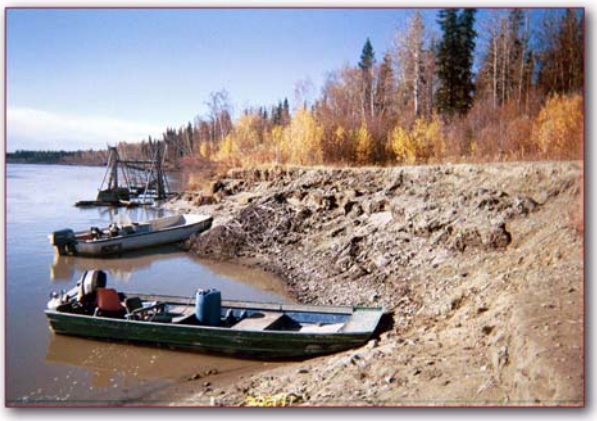


Figure 4-8 Chart 16206, Nome Harbor and Approaches

Kotzebue, a shallow-draft port, has a beached barge and small sheet pile dock owned and operated by the local freight company. Kotzebue has a small boat basin at Swan Lake. Access is through a backwater slough, through a lagoon to a shallow channel and under a low bridge. The City desires to expand the capacity of this facility and improve access. Other communities use sloughs, barrier sand bars, and other natural features to protect skiffs and small boats used for transportation for subsistence activity.

As we have seen, the Nenana Port Authority operates a dock, dry cargo loading and unloading facilities, bulkhead, and warehouse on the Tanana River. Nenana has a strong seasonal private sector economy as a hub for rail-to-river barge transportation services for the Interior.

Other coastal and river communities in the area lack shore facilities. Most fuel and cargo movements occur at beach-landing sites.



Tanana Chiefs Conference

Figure 4-9 Manley Hot Springs Barge Landing, Tanana River

Along the coast, barges equipped with ramps move to connect to shore on incoming tides in near still-water conditions. Forklifts, front-end loaders, and cranes transport cargo to shore depending on beach conditions and equipment. This seasonal operation is time-consuming and weather-dependent, and results in high fuel and freight costs. Breakwater construction can mitigate weather delays. Infrastructure can minimize inefficiencies, damage losses, and handling costs, but construction and infrastructure cannot mitigate seasonal conditions affecting the cost of shipping in the region.

4.2 State and Federal Role in Development

The state has a history of supporting critical port and harbor infrastructure, and has directly financed and constructed hundreds of facilities across Alaska. However, there is no annual program for regular construction and upgrade of the state's ports and harbors, unlike the programs that exist for highways and aviation. Options for federal funding include special Congressional appropriation and the USACE Navigation Improvement Program.

Navigation improvements eligible for USACE funding are limited to channel dredging, erosion control, and breakwaters where 65-80 percent of project cost is covered by the federal government. Local sponsors are responsible for all costs associated with other services needed to make the project viable, including inner-basin structures and facilities. DOT/PF assists a

community or borough with the federal and state funding process, and provides support for legislative requests for assistance to meet the non-federal costs. The local sponsor uses other federal and local funds for the balance of development costs. Projects that do not have substantial local financial support are often not successful in competing for limited state funds.

Except where no other appropriate authority exists, current state policy requires local governments to assume the operation and maintenance of state-owned port and harbor projects, and is encouraging local governments in some instances to assume local ownership of the facilities.

4.3 System Needs and Development

The Northwest coast lacks the deep water and relatively sheltered coastline found in other regions of the state where facilities have been constructed even in communities with small populations. Except for Nome and Kotzebue, there has been no substantial marine development in the region to support community development. While most of the communities have expressed a need for port and harbor improvements, there is an acknowledgement that cost far exceeds economic benefits in most cases. Carriers have responded to these conditions by adapting operations, vessels and handling equipment to the Northwest Alaska environment.

While the potential for more subregional ports is enhanced if roads can connect several communities, the distances between communities are vast, road construction costs are high, and consolidated freight volumes still are relatively low. For example, at the port facility at Nome, the 2,700-foot causeway required to get to deep water cost over $30 million. The proposed addition of another breakwater extension and dredging the entrance channel is estimated to cost $36 million more. Most communities have similar conditions where deep water is a mile or more offshore. Dredging and maintaining a channel or constructing long causeways costing several tens of millions of dollars is infeasible by any conventional standard.

North Slope Borough

Figure 4-10 October Storm in Barrow

Subsistence and cultural concerns drive local policy on development. The worldview of many communities is ultimately tied to subsistence products and subsistence pursuits. Promoters of economic development must keep in mind the dependence of community life on the bounty of land, river, and sea. Established

land use patterns, especially involving cultural sites, are not always clear to outsiders.

Development of the coast will likely be evolutionary and occur in conjunction with mega-million dollar projects associated with mineral development in the region. Those communities in close proximity to large infrastructure investments may benefit from this in terms of more jobs, better transportation services, and perhaps lowered cost of living. However, without an external catalyst, it is unlikely any individual community will have the means to develop substantial marine facilities that would actually reduce the cost of living in that community.

The key component necessary to reduce marine transportation cost in the region is to eliminate intermediate handling. This can only be accomplished through direct community access to line-haul barges. Nevertheless, there are opportunities to improve the basic conditions found at a number of the current beach landing sites. A series of small improvements to the linear elements of the system could make a small improvement in a community's quality of life. Table 4-3 is a sample of the kinds of improvements that might be considered for coastal communities in this area.

Every riverine community in this region with barge service needs a barge landing site with adequate draft, a good ramp to the river, good access to the community, a fixed object(s) for mooring, and a staging area for goods that are being loaded and unloaded.

Table 4-3 Navigational and Waterborne Infrastructure Needs in Northwest Alaska Coastal Communities

Community	Project Proposals
Barrow	Boat harbor
Brevig Mission	Docking facility
Diomede	Barge landing and skiff ramp
Elim	Beach road improvements
Golovin	Barge landing and small boat harbor
Kiana	Deadman[a]
Kotzebue	Deepwater dock, small boat harbor improvements
Koyuk	Deadman[a], small boat harbor feasibility study
Nome	Complete the proposed breakwater and port improvements
Port Lay	Improve boat landing
Saint Michael	Barge docking facilities
Shishmaref	Deadman[a]
Unalakleet	Deadman[a]
Wainwright	Build Tukpak Bar access road, dredge harbor at Kuk River.

a. Shore tie anchor point.

Chapter 5. Roads

As part of the Community Transportation Analysis (CTA), this chapter focuses on local and inter-community road needs to serve community economies and infrastructure development. Road and transportation improvements primarily designed to promote resource development in the region will be found in the Resource Transportation Analysis (RTA).

DOT/PF asked Northwest Alaska communities early in the planning process to nominate road projects for construction or improvement. These types of roads emerged as local priorities as seen in the resulting community nominations:

- Connections between communities
- Access to local rock and gravel resources
- Access to boat launch sites for commercial and subsistence fisheries
- Access to permanent barge landings to support fuel and freight transfers
- Construction or reconstruction of evacuation roads for coastal communities

Although the purpose of this plan is to address and, where appropriate, recommend the development of inter-community roads, priority issues for community roads will also be identified.

Alaska DOT/PF

Figure 5-1 Roads in Gambell

5.1 Inter-Community Roads

Although there is not a region-wide road system, numerous roads connect several of the area's communities (Table 5-1). Year-round freight delivery and travel between communities is restricted to air service. Seasonal travel by land occurs by trails and ice roads in the winter and by boats in the summer.

In the past, residents in many parts of the region have been supportive of roads to a neighboring community but were opposed to new roads that would connect their community to the statewide road system. Many residents fear that outsiders will have a negative impact on their subsistence areas and wildlife resources. However, more recently, some communities are shifting their positions to support connections to the road system to lower transportation costs and provide economic opportunities.

Table 5-1 Northwest Planning Area Inter-Community Road Inventory

Inter-Community Roads	Communities & Facilities Served	NHS[a]	AHS[b]	SHS[c]	Length (miles)	Surface	Ownership	Maintenance	Seasonal Closures
Dalton Highway	Deadhorse	✓		✓	414	Gravel & Pavement	DOT/PF	DOT/PF	None
Elliott Highway	Manley Hot Springs, Minto, Livengood		✓	✓	154	Gravel & Pavement	DOT/PF	DOT/PF	None
Nome - Council Road	Nome, Council		✓	✓	69	Gravel	DOT/PF	DOT/PF	Winter
Kougarok Road[d]	Nome, Pilgrim Hot Springs		✓	✓	85	Gravel	DOT/PF	DOT/PF	Winter
Nome - Teller Road	Nome, Teller		✓	✓	72	Gravel	DOT/PF	DOT/PF	Winter
Parks Highway	Nenana	✓			55[e]	Pavement	DOT/PF	DOT/PF	None
Ruby - Poorman Road	Ruby, Poorman			✓	36	Gravel	Local	Local	Winter
Stebbins - Saint Michael Road	Stebbins, Saint Michael				9	Gravel	Local	Local	None

a. National Highway System (NHS): The National Highway System is an inter-connected system of routes that serve important national functions (security, commerce, and travel). The NHS is comprised of principal arterial routes and routes connecting to intermodal facilities such as airports, ports, and ferry terminals. With a few exceptions, all NHS routes in Alaska are owned by DOT/PF.
b. Alaska Highway System (AHS): The Alaska Highway System is a new category of roads established in regulation in 2002. The AHS is comprised of highways that have statewide significance but are not on the NHS. The AHS includes routes that connect communities and routes that link to recreational sites or areas of resource development. Most AHS routes are owned by DOT/PF.
c. State Highway System (SHS): The State Highway System is comprised of roads owned by DOT/PF.
d. Also known as Nome - Taylor Road.
e. From Fairbanks to Nenana.

An example is Tanana, which recently passed a resolution in support of extending the Elliott Highway from Tofty to the Yukon River just upstream of Tanana. The goal behind the resolution is to create opportunities for community residents to work in Fairbanks in the winter. This extension of the Elliott Highway is being considered as the first leg of a proposed Yukon River Highway. Other communities re-considering road connections are Stevens Village and Anaktuvuk Pass.

The proposed Yukon River Highway corridor (Map 1-3) would ultimately connect the Seward Peninsula and communities along the Yukon River with the Elliott Highway near Manley Hot Springs. The road would connect communities and provide opportunities for local economic development.

The Tanana Chiefs Conference (TCC) and DOT/PF have agreed that if funding becomes available for a Yukon River Highway Feasibility Study, they will work together to ensure the study accurately reflects affected villages' interests and goals.

5.2 Community Roads

Travel within most communities is by ATVs in the summer and snowmachines in the winter. A few coastal and tundra communities use boardwalks over wetlands and soft tundra areas to accommodate ATVs that haul mail, water, sewage, and freight. A few communities, such as Unalakleet and Tanana, have small road networks and a growing number of cars and trucks. The region's hub communities, such as Nome, Barrow, and Kotzebue, have vehicle fleets similar to most small towns in Alaska. In many cases, community road systems suffer greatly for lack of maintenance.

A high priority for the local road system in many communities is the need to improve dust control, and to improve access to sanitation facilities, subsistence areas, and gravel sources. These community projects can have a significant impact on the health and well-being of the area's residents.

Alaska Division of Tourism

Figure 5-2 Child on ATV

5.2.1 Access to Rock and Gravel Sources

Access to gravel sites to support community development was identified as a need in many of the area's communities. Despite the importance of gravel to community development, these projects do not score well in the Statewide Transportation Improvement Program (STIP) process. Processes and funding programs to give greater priority to these projects is needed, particularly when gravel is located within a reasonable distance of a community.

5.2.2 Access to Boat Launch Sites and Permanent Barge Landings

Access to boat launch sites to support community commercial and subsistence fisheries is important in many villages. While these types of projects do not currently score well in the department's STIP process, both the department and the villages look to organizations like the Denali Commission for funding.

One task identified in the plan for future action by DOT/PF, in cooperation with the U.S. Corps of Engineers (USACE) and the Denali Commission is development of a catalog of boat launch projects. The catalog can then be used with ranking criteria to prioritize projects for funding as it becomes available. DOT/PF could logically participate in the road access portion of these projects.

The same cataloging task is needed for permanent barge landings. This is one of the most important improvements that can be made at the village level for improved fuel and freight delivery. This task would

identify barge landing sites that would sustain for at least ten years. The sites would need to be able to accommodate deadman anchors at the site for the barges to tie into and an area for a gravel pad and fuel header system that would receive fuel and freight from barges. In larger communities, barge landings with a dock face would facilitate larger volume fuel and freight transfers. DOT/PF would likely participate in road construction to the barge landing sites.

5.2.3 Community Evacuation Roads

Evacuation roads are critical to communities that are frequently subjected to harsh weather and natural hazards. Flooding and erosion, for example, is a significant problem in Gambell and community evacuations occur periodically because of flooding during periods of high surf. However, construction of evacuation roads in Gambell that were started in the 1980s were never completed due to a shortage of funds. A project now under consideration by DOT/PF involves upgrading the existing community evacuation road and extending it another 4-5 miles to Aqeftabak Bay[1]. Other communities such as Diomede, Shishmaref, and Point Hope have also identified the need to build or improve evacuation roads.

Alaska DOT/PF

Figure 5-3 Gambell Evacuation Road

5.2.4 Dispersal Points for Subsistence Activity

Communities such as Anaktuvuk Pass and Point Hope have requested new roads to improve access or provide new dispersal points for subsistence activities. This type of project does not score well in the STIP process. However, funding for these projects may be available in the future through the Denali Commission or the Bureau of Indian Affairs.

5.2.5 Sanitation Roads

Roads to new and existing sanitation facilities such as landfills and water and wastewater facilities are needed to improve health and sanitation in the communities. DOT/PF will work to improve coordination with the Alaska Department of Environmental Conservation's Village Safe Water Program and the Alaska Native Tribal Health Consortium so that road construction is concurrent with facility development whenever possible. In addition to providing road access to new sanitation facilities, many existing facilities need road service.

1. Project Summaries by Topic, Bering Strait Regional Funding Summit, April 2001.

5.2.6 Dust Control

Dust control was identified as a high priority in nearly all communities. Dust from airports and roads with untreated surfaces tend to contaminate drying food, pollute rainwater, and contribute to respiratory problems in children and the elderly.

Alaska DOT/PF

Figure 5-4 Walrus Drying

In an effort to improve dust control, DOT/PF is working with communities on programs that include the use of dust control chemicals or the chip sealing of existing roads to reduce dust pollution. A pilot program to reduce dust pollution is underway in six of the Seward Peninsula/Norton Sound communities. If successful, the program could be implemented area-wide in the future.

Despite local and state efforts to minimize dust from existing roads and runways, it is important that dust control measures be addressed in the design of future roads. Additionally, DOT/PF will continue to do dust control research.

5.3 Regional Analysis

5.3.1 Northwest Arctic Borough Subregion

There are no roads connecting the Northwest Arctic Borough's eleven communities and, like the other subregions, year-round travel between communities is restricted to air. During the warmer months when rivers are navigable, boats are the main transportation link between communities. In the winter, some communities are connected by winter trails used by snowmachines and dog teams.

While many in the region support development of inter-community roads, many are concerned that new road corridors will have a negative impact on local subsistence resources. The Northwest Arctic Borough has the second highest dependence on subsistence harvests in the entire state with an average annual harvest of 617 pounds of wild food per person per year[2]. Protecting local subsistence resources, an important economic commodity in this region, will be critical in the design of any future transportation systems in the area.

Local road needs in this area include roads to gravel sources in Kiana and Selawik and roads to ports and barge landing sites in Deering, Kotzebue, Buckland, and Noatak (Table 5-2).

2. Alaska Department of Community & Economic Development, *Alaska Economic Information System*, 2003.

Table 5-2 Northwest Arctic Borough Subregion Recommended Road Projects

Suggested Road Projects	Distance	Location	Function or Purpose & Need	Estimated Cost
Noatak Barge Landing Road	1.5 miles	Noatak	Access to barge landing site.	$1,700,000
Deering Cape Deceit Road	2 miles	Deering	Access to landfill, cemetery, and beach/ barge landing site.	$1,500,000
Kiana Gravel Source Road	3 miles	Kiana	Material site access.	$2,000,000
Shungnak Community and Landfill Road	1.5 miles	Shungnak	Access to landfill, gravel source, and cemetery.	$1,000,000
Selawik Spud Farm Road	11 miles	Selawik	Access to gravel source and subsistence areas.	$11,000,000

5.3.2 North Slope Borough Subregion

The Dalton Highway, which connects to Deadhorse/Prudhoe Bay, provides year-round vehicular access to the state highway system. The Dalton Highway, built in the 1970s in conjunction with the Trans-Alaska pipeline to establish a road connection to the Prudhoe Bay oil production facilities, now serves as an industrial route for trucks servicing the North Slope oil fields and as a travel way for visitors.

Without connecting roads elsewhere in the region, year-round travel between other North Slope Borough communities must occur by air. Travel by vehicles in the subregion is possible on a temporary basis in winter in some areas by “ice roads.” The North Slope Borough maintains approximately 43 miles of ice roads annually for winter use.

Cat-trains, an alternate form of roadless travel, are used in the North Slope area to transport freight from Barrow. Cat-trains were developed by the Crowley All-Terrain Corporation as a way of hauling freight during the summer over fragile roadless tundra without damaging the tundra by using low-pressure air bags.

Alaska DOT/PF

Figure 5-5 Dalton Highway Crossing Brooks Range (Atigun Pass Area)

These “air bag” tires distribute the weight of a loaded vehicle over a large area, minimizing damage to the fragile underlying soils. These vehicles also allow freight transport over rocky and uneven

surfaces. The company has also successfully used these transport vehicles under arctic winter conditions and to haul heavy loads in swamps, bogs, and tussock tundra.

Nuiqsut currently accesses the Dalton Highway and the Deadhorse Airport by an ice road connector to existing oilfield roads on the North Slope. The community has expressed interest in having all season access to those roads. All season access is being examined as part of the DOT/PF RTA project.

Table 5-3 lists suggested road projects in the North Slope Borough subregion.

Table 5-3 North Slope Borough Subregion Recommended Road Projects

Suggested Road Projects	Distance	Location	Function or Purpose & Need	Estimated Cost
Wainwright Tupkak Bar Road	3 miles	Wainwright	Access to a barge landing site.	$4,500,000
Barrow to Atqasuk	70 miles	Barrow & Atqasuk	Provide road connection for community/ provide trunk line for oil companies.	
Point Hope Multi-Purpose Road	29 miles	Point Hope	An evacuation road that would also open up hunting opportunities.	$32,000,000
Nuiqsut Bridge Repair		Nuiqsut	Reconstruct bridge to provide access to material site and river.	$450,000
Barrow to Wainwright	110 miles	Barrow & Wainwright	A corridor that would provide for a road and gas transmission network.	
Bettles to Dalton Highway	35 miles	Bettles	Provide access from Bettles to the state road system.	$35,400,000
Anaktuvuk Pass to Dalton Highway/Spur from proposed Foothills Road[a]		Anaktuvuk Pass	Provide access from Anaktuvuk Pass to the state road system.	
Stevens Village to Dalton Highway	30 miles	Stevens Village	All season community access to the Dalton Highway for improved fuel and freight transport and personal transport.	$20,000,000

a. Construction of the Anaktuvuk Pass to Dalton Highway/Spur from the proposed Foothills Road is beyond the 20-year horizon of this plan.

5.3.3 Middle Yukon River Basin Subregion

Few roads and inadequate docking facilities currently impede the movement of people and goods, challenging economic development in this subregion. Aviation is the principal means of transporting people and freight between communities in the area. Trails used by snowmachines and ATVs provide seasonal access between some areas.

The RTA proposes the development of a road corridor between Ruby and McGrath to access the region's mineral resources. This project, providing a connection for Ruby to McGrath's 5,400-foot airport, is appealing because of local support and the absence of significant fish and wildlife issues or land use conflicts along the corridor. The most challenging task of

developing this road will be to design a low-maintenance alignment and anticipate the region's economic development potential over time.

The proposed Yukon River Highway, for which Tanana Chiefs Conference will lead a feasibility study, has the potential to link communities along the Yukon River between Manley Hot Springs and Council and Saint Michael. This project is recognized as likely being outside the 20-year window of this plan.

Inter-community projects proposed by communities in the area include studying the feasibility of using the old Kaltag/ Unalakleet trading route to ship fuel by truck from Unalakleet to Kaltag and then onto other Yukon River communities by barge to reduce the high cost of fuel. Other priority projects include developing an 8-mile road in Kaltag and a road between Eureka and Rampart (Table 5-4).

Alaska DOT/PF

Figure 5-6 Tanana Gravel Access Road

Table 5-4 Middle Yukon River Basin Subregion Recommended Road Projects

Suggested Road Projects	Distance	Location	Function or Purpose & Need	Estimated Cost
Kaltag-8-Mile Spring/Hatchery Road	8 miles	Kaltag	The hatchery road is a trail that needs to be upgraded to a road. This project is already on the Needs List.	$4,000,000
Kaltag to Unalakleet Road	90 miles	Kaltag & Unalakleet	This road would connect the two villages via an old trading route. The route is also part of the Iditarod Trail and has been identified as a portion of the proposed Yukon River Highway.	$100,000,000
Eureka to Rampart Road	14 miles	Eureka & Rampart	This road would connect Rampart to the highway system and allow another road access point to the Yukon River.	$32,000,000

5.3.4 Seward Peninsula/Norton Sound Subregion

Air travel provides the only year-round access to and between communities in the Seward Peninsula/Norton Sound subregion. Approximately 230 miles of gravel roads provide seasonal road service between Nome, Teller, Mary's Igloo, Solomon, and Council. The lack of inter-connected roads elsewhere often means that lighter goods such as mail and perishable food products typically move by air and heavier materials arrive by water.

Residents of the region are generally supportive of new road development in the region that can decrease travel costs, create opportunities for development, and reduce freight and fuel delivery costs.

A road system to connect Golovin, White Mountain, and Elim was proposed by these communities to support development of a fuel storage farm in Golovin and eliminate the unpredictable nature of fuel delivery by river that currently occurs. Savoonga and Gambell have also requested that a road be built to connect their communities.

Local road projects needed in the area's communities include the construction or improvement of evacuation roads in Gambell, Diomede, and Shishmaref; a sanitation road to the landfill and water source in Wales; and improved access to ports and barge landings in Tin City, Unalakleet, and Koyuk (Table 5-5).

Alaska DOT/PF

Figure 5-7 Former Cushman Street Bridge from Fairbanks Relocated on the Kougarouk Road (Nome Area)

Kawerak Inc.

Figure 5-8 Local Roads in Shishmaref during Spring Melt

Table 5-5 Seward Peninsula/Norton Sound Subregion Recommended Road Projects (Page 1 of 2)

Suggested Road Projects	Distance	Location	Function or Purpose & Need	Estimated Cost
Elim, Golovin, White Mountain	50 miles	Elim	Road access between Elim, Golovin, and White Mountain benefiting inter-community travel and freight and fuel storage and delivery.	$45,000,000
Koyuk Road to Boat Launch Site	6 miles	Bering Straits Region	Road access to a potential deep water boat launch site.	$5,000,000
Nome Highways	240 miles	Nome, Teller, Solomon, & Council	Improve three highways to benefit tourism, recreation, mining, and subsistence.	Not available
Savoonga to Gambell Road	75 miles	Savoonga & Gambell	Road access between Savoonga and Gambell.	$80,000,000
Shaktoolik Foothills Road	14 miles	Shaktoolik	Road access to subsistence sites, gravel sources, and a landfill.	$9,000,000
Saint Michael to Unalakleet	75 miles	Saint Michael & Unalakleet	Road access to a potential deep water port with Unalakleet and eventually the Yukon River Road network.	$75,000,000

Table 5-5 Seward Peninsula/Norton Sound Subregion Recommended Road Projects (Page 2 of 2)

Suggested Road Projects	Distance	Location	Function or Purpose & Need	Estimated Cost
Wales to Brevig Mission Connector	50 miles	Wales & Brevig Mission	Road access between Wales, Brevig Mission, Teller and Nome.	Not available
Wales to Tin City Road Improvements	10 miles	Wales	Improve road access between Wales and Tin City to benefit access to the Tin City airport by Wales residents.	$6,000,000

5.4 Funding Sources

The State of Alaska and several federal agencies, including the Bureau of Indian Affairs (BIA), administer federal highways funds allocated to Alaska. As funding allows, the Denali Commission has also sought to help meet rural transportation infrastructure needs that are not covered by DOT/PF and BIA funding and development programs.

Alaska DOT/PF

Figure 5-9 Holy Cross

Chapter 6. Nome Tourism Study Summary

***Nome Area Tourism Demand, Potential, and Infrastructure Study*, Prepared by Land Design North, 2003**

Overview

Over the 20-year life of the Northwest Alaska Transportation Plan (2005-2025), the Seward Peninsula's economy will be challenged to diversify and grow given its predominant government service sector. As the State of Alaska trims its budget, and with recent shifts in federal funding priorities, employment opportunities may be eroded.

At the same time, traditional wage opportunities in fishing, mining, and construction are subject to seasonal fluctuations and to unforeseeable factors like world mineral prices and fish returns. For these reasons, this study examined how tourism, one of the few basic industries growing on a statewide basis, can be enhanced and encouraged in the Nome area to support the region's economic future.

This study estimates that tourism currently brings $3.7 million per year into the Nome area economy. As local beneficiaries (e.g., tourism industry workers, local business owners, and Native artisans) spend their earnings, the multiplier-effect of these dollars circulating in the region is $4.9 million.

The projected growth potential for this sector over the next twenty years ranges from a low of $3.6–$3.7 million in annual benefits for 2024, to a medium range of $8.13 million. The high projection is $14.6 million by 2024 with a multiplier impact of $19 million — a significant boost to the Seward Peninsula's economy.

Carrie M. McLain Memorial Museum

Figure 6-1 Nome's Beach during the Gold Rush

Nome clearly has the natural resources and intrinsic qualities needed to strengthen this economic sector; "there is no place like Nome." The study examined Nome's regional tourism from many angles and found that the region has a good deal going for it. Nome can capitalize on its strong name recognition, the region's history, tundra, wildlife, rare birds, outdoor activities, the Iditarod, and its established infrastructure and amenities. The area appeals to independent-minded visitors from around the world, a class of visitor that tends to spend more money and time than the typical Alaskan tour group/cruise passenger tourist.

Nome and its residents are also doing a good job of promoting and supporting tourism given the population base and the region's limited financial resources.

Improving this sector, however, is a challenge with global implications. Nome is a remote and expensive destination with a limited potential visitor base, and a limited visitor season. Nome competes with destinations that are exotic, cheaper to visit, quicker to fly to, that have more infrastructure and visitor amenities, and that have significantly greater marketing resources. Also, tourism in Nome, like everywhere else, is impacted by state and world affairs, and global economic trends that are outside local control.

John Doyle

Figure 6-2 Ocean Ice at Nome
Nome competes with tourism destinations that are warmer, cheaper, and easier to visit.

Given these opportunities and challenges, Nome tourism interests and the state need to carefully consider how to sustain and grow this economic sector without over-investing. The strategies that follow were developed to help decision-makers balance these concerns.

Strategies

This chapter presents strategies for enhancing Nome's regional tourism in general, and for cultivating each sector. Because action and investment will have to be prioritized, sectors are presented in order of their potential economic value over the next twenty years (see Table 6-1). Although the projections are speculative, this breakdown of sectors in order of their relative value is used to help area residents and the state decide which strategies will yield the most benefits.

Table 6-1 Nome Area Tourism Sectors by Market Value, 2004 - 2024

High ↕ Low	1-Small Group / Independent Tourists
	2 -Birders
	3 -Special Events / Iditarod
	4 -Air Package Tours
	5 -Hunting / Fishing
	6 -Business Travel
	7 -Winter Adventure
	8 -Expedition Cruise
	9 -Visiting Friends and Relatives

As an example, in twenty years the expedition cruise sector is estimated to have an annual value of $420,000 in the high scenario. This is much lower than the 2024 high scenario estimated birding sector value ($2.8 million) because cruise passengers are in Nome for such a short time. Although efforts should be made to accommodate the cruises, the potential overall return on the communities' investment is expected to be less than most other sectors.

Each strategy is also classified based on its relative cost to implement and its potential for economic return:

- Strategies for immediate consideration have a relatively low cost with a high potential for return.
- Wait and see strategies have a higher cost, and greater risk of return on investment. These should be acted on when cost-benefit

conditions and other considerations merit action.

Alaska DOT/PF

Figure 6-3 Sunset

6.1 General Tourism

6.1.1 Projections

Tourism in the Nome area attracts an estimated 10,000 annual visitors with direct benefit of $3.7 million, and an indirect benefit of $4.9 million each year. As summarized in Table 6-2, the estimated growth potential for this entire sector over the next twenty years ranges from a low of $3.6–$3.7 million in annual benefits by 2024, to a high of $14.6 million with a multiplier impact of $19 million.

6.1.2 Strategies for Immediate Consideration

A. Regional Tourism Working Group

Intent: To create a critical mass of regional interests that can coordinate and act on strategic issues consistently over time, and that can foster strong, beneficial, and lasting relationships with tourism interests.

Table 6-2 General Tourism Projections

Current Status	
Total estimated annual value	$3,775,000
Estimated "multiplier effect"	$4.9 million
Total estimated annual number of visitors	9,800
Current Trend	
Declines in air package tourists, Iditarod visitors, and independent travelers are partially being offset by increased numbers of birders and adventure cruise passengers.	
Potential Economic Value in 2024	
Low Case:	
Total estimated annual value	$3.6 to $3.7 million
Estimated "multiplier effect"	$4.7 to $4.8 million
Total estimated annual number of visitors	8,520
Medium Case:	
Total estimated annual value	$8.13 million
Estimated "multiplier effect"	$10.5 million
Total estimated annual number of visitors	21,380
High Case:	
Total estimated annual value	$14.6 million
Estimated "multiplier effect"	$19 million
Total estimated annual number of visitors	36,560

Although Nome already has an effective Convention and Visitor's Bureau (NCVB) and Chamber of Commerce to take the lead on the findings of this study, leaving the growth of this economic sector up to these two organizations will narrow the region's opportunities significantly.

In a competitive tourism market, it takes a broader community effort or a strong coordinated critical mass to make sure that all strategic and tactical bases are covered (e.g., to work with cruise expedition planners to iron out the logistics so that cruise ships arrive in Nome, and

then make sure that there are rest rooms open for the passengers when they arrive).

Description: Group participants would potentially include the region's communities (City of Nome, Teller, Brevig Mission, Golovin, and potentially Kotzebue and others, as interested), NCVB and Nome Chamber of Commerce, Native regional and village corporations, tourism business owners, DOT/PF, Alaska Airlines, and regional health service providers.

The group could be developed through the Nome Visitor Association, or perhaps be organized by the Bering Straits Development Council under the Alaska Regional Development Organizations Program (ARDOR). Under ARDOR, the group could receive grants from the state as a regional initiative to help develop Alaska's economy. Potentially, Alaska Airlines could provide members airfare to enable meetings both at the regional level and with Seattle- and Anchorage-based interests.

The group's work would begin by looking at the existing tourism marketing plan and revising it to explicitly address the following:

- ***Community coalition.*** How to effectively involve all affected parties in improving the region's tourism and implementing strategies presented in this study.
- ***Partnerships.*** How to build strong relationships within the tourism industry (with airlines, cruise lines, tour group planners, etc.) and work effectively with key state agencies and interests.
- ***Sub-market targets.*** How to market effectively to tourism sub-markets such as birders, adventure cruises, etc.
- ***Regional center planning.*** How to be a better host to regional residents who need goods and services, and develop tourism jobs with regional benefits.
- ***Collaboration with Kotzebue and Barrow.*** How to develop a collective tourism lobbying and marketing effort that benefits the entire region. This effort will have to build on common interests and slowly create trust (the economic summit every three years is a model to start from).

Lois McIver

Figure 6-4 1950s and '60s Water Delivery Truck

Good coordination on little and big strategic issues (like water delivery to cruise ships) is key to growing the tourism sector.

B. Tourism Jobs

Create Local Flight and Air Service Jobs

Intent: Create locally-based jobs in the flight and air service sectors.

Description: Develop a strong technology program and job-training facilities, potentially working with the University of Alaska Fairbanks (UAF) Northwest Campus.

Tourism / Customer Service Training

Intent: Train regional residents in customer service and other skills so that they can be employed in the tourism sector and/or start small businesses.

Description: Use Alaska HOST Industry Training through the Alaska Division of Trade and Market Development or through the UAF Northwest Campus program with an emphasis on customer service.

C. Attractions

Make Front Street an Attraction

Intent: Encourage tourists to spend more time and money downtown by providing amenities and improvements that encourage them to linger and shop.

John Doyle

Figure 6-5 Nome's Front Street
Nome's historic character is not as apparent downtown today because of three major fires.

Description: Provide amenities and interpretation that emphasize the local flavor and historic character of Nome including seating, interpretive information, trash cans, and perhaps develop a program with businesses for planters and/ or winter accents like lighting or ice sculpture. DOT/PF currently has partial funding to initiate this project.

Cultural Interpretive Opportunities

Intent: Help visitors understand and connect with the cultural stories and elements in the region while helping Nome capitalize on its rich heritage.

Description: A facility in Nome would be highly valuable if it served as a destination and a point of departure for outlying cultural attractions. Participants in the study agreed that this is important, and many ideas are being explored:

- Co-location with an improved museum
- Construction of an in-town Nome regional cultural center that could be used for multiple purposes such as Native art production and sales, demonstrations, cultural events, and workshops
- Sitnasuak Native Corporation is proposing a village on their property with Native-based attractions focused on the region's four aboriginal cultural groups (Solomon, King Island, Nome Eskimo, and Council)
- Developments at Mary's Igloo and Teller have been proposed

D. Access

Woolley Lagoon Road Access

Intent: Ensure that Native Alaskan artists are able to access the coast at key times of year to gather materials needed to produce arts and crafts.

Description: Keep the Woolley Lagoon Road in drivable condition.

6.1.3 Wait and See Strategies

E. Attractions

Create a Major Attraction

Intent: Develop a significant attraction or several connected attractions that would change the magnitude of tourism interest in the area.

Description: The Seward Peninsula could attract a broader range of visitors with a major attraction, although this would require a significant investment in facility and access improvements. Some of the ideas include development of:

- Bering Land Bridge National Preserve / Serpentine Hot Springs — extend the Kougarok Road out to the springs
- Pilgrim Hot Springs / Mary's Igloo
- Larger scale historic restoration (e.g., Front Street, Council, and other historic locations)
- Train to Nome — connection via the Alaska Railroad
- Road to Nome — connection via a Yukon River road

Lois McIver

Figure 6-6 Mother and Child
Many tourists are interested in Native culture but have little exposure during their trip.

- "Ring Road" connecting Teller with Pilgrim Hot Springs and Council:
  - One alternative would go by Imuruk Basin, connecting Council, Pilgrim Hot Springs, and Teller
  - Another alternative would use existing trails for the most part, connecting Glacier Creek Road to Kougarok Road via Stewart River, then connecting Kougarok Road to Council Road via Iron Creek, Casadepaga, and a Corduroy Road north of the Solomon River. This alternative would use RS2477 trails. These could become the basis for a State Scenic Byway trail system.

http://www.kicy.org/kicyretr.htm

Figure 6-7 Serpentine Hot Springs
Serpentine Hot Springs in the Bering Land Bridge National Preserve could be more of an attraction with improved access and facilities.

Figure 6-8 Nome Sunset

6.2 Small Group / Independent Tourists

(not including birding, hunting, fishing, and winter adventure)

6.2.1 Projections

Small group and independent tourists are by far Nome's most valuable tourism sector, and in some ways the least defined by this study because sub-sectors for this general category were segmented out and addressed separately (e.g., birders, hunters, anglers, visiting friends and relatives, and winter adventure travelers). It would be valuable for Nome to learn more about these independent travelers in order to better address their needs and to target marketing.

Although this market is currently flat, the sector has strong growth potential and is valuable because independent visitors tend to stay longer and spend more money than tour group participants.

Table 6-3 Small Group/Independent Tourists Projections

Current Status	
Total estimated annual value	$1,200,000
Total estimated annual number of visitors	2,000
Estimated average length of stay	3 days
Estimated average per diem	$200
Current Trend	
Flat in Alaska as a whole in response to global tensions and the weak U.S. economy.	
Growth Potential (Number of Visitors in 2024)	
Low Case:	2,000
Medium Case:	5,300
High Case:	9,330

6.2.2 Strategies for Immediate Consideration

A. Airport

Private Sector Airport Shuttle Between Air Carriers and Town

Intent: Provide small group/independent tourists and regional residents arriving in Nome with a seamless connection between air carriers and downtown.

Description: This is probably a small business opportunity that existing taxi providers could fill by using larger vehicles, which could potentially have a tour component (e.g., provide short orientation to Nome with drive by St. Joseph's Church, the museum, and the visitors center).

B. Road Maintenance

Improve Summer Road Conditions

Intent: Keep the roads maintained to a level that rental car agencies will not restrict access, and if possible, to a level that allows two-wheel-drive rentals into the market.

Description: Through the following actions, improve the road conditions:

- ***Upgrades to the Council and Teller Roads.*** Project cost should not exceed $1 million so that the limited bonding ability of local contractors does not require that the work go out of state.
- ***Pilgrim Hot Springs Access.*** Maintain this stretch of road in four-wheel-drive condition to allow tourism use.
- ***Gravel Road Maintenance Best Practices Training.*** Create a video and/or a training program to ensure that all grader operators and maintenance staff are knowledgeable about the best practices for keeping northern gravel roads in good condition, including maintaining the crown and enhancing drainage conditions.
- ***Work with the Federal Highway Administration on more cost-effective maintenance options.*** Research "high float" pavement surfacing and other potential options that may provide a more cost-effective approach to keeping the roads in good condition. Work with the Federal Highway Administration to see if there are ways of using money available for capital improvements to reduce maintenance costs, or to obtain federal funds for maintenance. The U.S. Department of the Interior could potentially provide matching funds where Native villages and corporations derive benefit.

Provide Some Basic Roadside Amenities and Interpretation

Intent: On a limited scale provide independent travelers with more amenities, services and interpretation to enhance their enjoyment of the road system.

Description: Develop aesthetic turn-outs, waysides, roadside monuments, and rest rooms for visitors in a few genuinely interesting sites (such as those currently nominated in the STIP[1]). Use materials that are well-suited to the harsh weather and easy to maintain.

C. Visitor Attractions

Information and Interpretation for Roadside Attractions

Intent: Make the history, natural features, and recreational opportunities along the road more accessible by providing a cohesive system of improvements, information, and interpretation.

Description: Document the roadside attractions, including mining canals, trails, and any public recreational sites, and develop a map, informational brochure, and website. Global Positioning System (GPS) routes and/or roadside milepost information could be incorporated to help adventurers find their way.

Trails could be developed around themes through certain areas (birding or Audubon trail, mining history and canals, Iditarod) and interlinked. Such a system of coordinated information in greater depth could be targeted to Elderhostels, birders, and history buffs.

R.S. Finnie, National Archives of Canada

Dan Heringa, Nunavut Tourism

Figure 6-10 Inuit "Inuksuk"
Roadside markers, monuments and interpretive elements should be both interesting and durable. The Inuit "Inuksuk" above are a good example of markers used on the tundra that provides meaning for the traveler (caribou, shelter) and adds interest to the landscape, while holding up to the elements. Traditionally it is said that if one destroys an Inuksuk, his or her life will be cut shorter.

Figure 6-9 Nome Convention and Visitors Bureau

6.2.3 Wait and See Strategies

D. Access

Kougarok Road Rebuild and Extension

Intent: Enhance access to the Bering Land Bridge National Preserve as an attraction, with a strong link to Pilgrim Hot Springs.

Description: Kougarok Road should be extended to Serpentine Hot Springs and the National Preserved (and mining sites) and repaired through Force Account to create local economic benefits from the road project.

1. Statewide Transportation Improvement Program.

E. Airport

Combined Terminal

Intent: Create a community airport with seamless service between carriers, consolidation of security equipment and Immigration and Naturalization Service (INS) and Customs services, with information for independent tourists that welcomes and helps orient them to the region.

Description : Develop utilities (sewer and water) and build a combined terminal community airport. Funding is a big question, although there may be a source of funding from recent security legislation. It would need to be a city effort with Alaska Airlines support, perhaps through a Port and Airport Authority (this is possible in a 1st Class City). It would combine security, baggage handling, INS and Customs services, and also offer a potential location for tourism orientation/information. Some residents suggested that it would be best if the whole airport were moved because the current airport sits on poor soil and requires repeated, costly rehabilitation, but acknowledged that this is 20-30 years in the future.

6.3 Birders

6.3.1 Projections

Birding is Nome's second most important tourism sector, and it is currently growing. Potentially it could provide $2.8 million in benefits per year by 2024. Birders tend to stay longer than any other tourist group, and also tend to come early in the summer, filling hotel rooms that might otherwise be vacant.

Table 6-4 Birding Tour Projections

Current Status	
Total estimated annual value	$600,000
Total estimated annual number of visitors	750
Estimated average length of stay	4 days
Estimated average per diem	$200
Current Trend	
Up - partly in response to a 2000 article about Nome in *Birding* magazine.	
Growth Potential (Number of Visitors in 2024)	
Low Case:	920
Medium Case:	1,360
High Case:	3,500

6.3.2 Strategies for Immediate Consideration

A. Roads

Improve Spring Access and Road Information for Birders and Anglers

Intent: Encourage growth in this sector by assuring access to birding areas.

Description: Through the following actions, try to make key birding and fishing areas accessible by road as early as possible in the spring (early May is ideal).

- ***Manage winter snow build-up.*** Even after the "no winter maintenance" signs go up in the fall, work to keep glaciers from developing in low spots on the road that will be very expensive to clear.
- ***Correct cut and fill problem areas.*** DOT/PF can save money over the long run if cut and fill areas that

make snow removal more difficult are identified and corrected. New road locations and designs should encourage snow removal by sun and wind.

- ***Real-Time Information.*** DOT/PF can help birders better plan and enjoy their trip by providing up-to-date information on whether the roads are open. This should be done via web-page, and at one bulletin board or birding log book site in town. Both should be updated daily during the break-up season. Information could include: estimated dates when the roads will be open to Safety Sound, Coffee Point, and Teller, along with a note of how far each road is open today. A fun addition would be an interactive element where birders can report back each day what birds were seen where, by whom, and what today's road conditions were like.
- ***Dust.*** During the birding season and especially in the early summer, mitigate dust problems on key stretches of road, especially in the Safety Sound area.

Figure 6-11 Spring Road Opening
Using available DOT/PF staff and equipment to "chip away" at the ice over the winter may help with spring opening of roads.

B. Attractions

Birding Resources

Intent: Generate more interest in Nome's birds both locally and globally by building on existing expertise and interest, and providing greater visitor resources on birding.

Description: Local birders can help Nome explore the potential of improving birding as an attraction through the following:

- ***Birder in Residence.*** Designate a birding expert (local or not) who can serve as a resource for birders during the birding season, and perhaps at other times of the year, teach regional school kids about birds, run a website with bird-siting information, and write articles for birding magazines.
- ***Birding Festival.*** Other communities have been successful at creating events that attract birders and local residents during key seasons. Perhaps Safety Lagoon, Pilgrim Hot Springs, or Salmon Lake could be sites for a birding festival.
- ***Birding Trails.*** An Audubon-type birding trail system could be an attraction, especially if a map with GPS coordinates and some interpretive information was developed and marketed.

6.3.3 Wait and See Strategies

A. Roads

Kougarok Road Rebuild and Plowing to Coffee Dome

Intent: Enhance access to the key birding attraction in the region – Coffee Dome at around mile 70 on the Kougarok Road during the prime season.

Description: Rebuild Kougarok Road to Coffee Dome (project cost should not exceed $1 million increments; use the state's Force Account). Plow to open Coffee Dome by a certain date each year so birders can plan accordingly.

Figure 6-12 Kougarok Road's Coffee Dome Area is a Key Birding Attraction

6.4 Special Events — Iditarod

6.4.1 Projections

The Iditarod is one of Nome's unique attractions that brings world-wide attention to the area while filling hotel rooms with tourists during the winter season. On the low end, this sector is anticipated to remain flat over twenty years. On the high end, the value of the race could more than double and reach $1.3 million in benefits by 2024.

It is important not to take this sector for granted, as the recent downturns in this sector demonstrate. Stretching out the Iditarod season and keeping the event in the world spotlight are important both for Nome's identity and tourism growth.

Table 6-5 Special Events[a] Tour Projections

Current Status	
Total estimated annual value	$600,000
Total estimated annual number of visitors	1,500
Estimated average length of stay	2
Estimated average per diem	$200
Current Trend	
Down - As Iditarod race times get faster, visitor stays are shorter.	
Growth Potential (Number of Visitors in 2024)	
Low Case:	1,500
Medium Case:	2,230
High Case:	3,270

a. Includes Iditarod Sled Dog Race

6.4.2 Strategies for Immediate Consideration

A. Attractions

Iditarod "Summer" Trail

Intent: Stretch out the Iditarod with summer hiking, interpretation, events, and activities along the Iditarod trail.

Description: Work with the U.S. Bureau of Land Management (BLM) to develop and market the Iditarod summer trail system. Tap into youth interest in the event and

sled dogs, and make the trail a "family tourism" summer destination, perhaps even with a summer youth camp component, or annual event with the winner of the youth Iditarod.

Iditarod Tourist "Special Offers"

Intent: Lengthen tourists' stay in the region by offering special fares for excursions.

Description: Flight-seeing, snowmobile and dog sledding excursions, and other businesses could work to keep tourists an extra day or two, perhaps by partnering with Alaska Airlines and offering a special Iditarod Package.

6.4.3 Wait and See Strategies

Add-on Winter Attractions

Intent: Keep Iditarod tourists in town longer by developing "add-on" winter attractions.

Description: Look into Scandinavian winter tourism (ice hotels, winter resorts, saunas) and see if there is a market to provide similar attractions (targeting Northern Europeans) at Pilgrim Hot Springs and/or Serpentine with access via dog-sled and snowmachine). Iditarod winners could also be encouraged to spend time with tourists after the race at such a facility to attract publicity.

6.5 Air Package Tours

6.5.1 Projections


Alaska Airlines

This used to be a key market segment for Nome, but the number of visitors on this tour has been dropping steadily in recent years, approximately 15% to 20% annually. Anecdotal reports from Nome tour operators and the airline suggest that the numbers for this tour exceeded 10,000 in the 1970s and 1980s. Potentially, this tour (offered by Alaska Airlines between mid-May and mid-September) could remain flat over the next twenty years, or could regain some ground to achieve 2,640 visitors per year at a $1.3 million benefit to the local economy.

Table 6-6 Air Package Tour Projections

Current Status	
Total estimated annual value	$480,000
Total estimated annual number of visitors	1,200
Estimated average length of stay	2
Estimated average per diem	$200
Current Trend	
Flat / declining - As the demographics of cruise passengers changes (passengers have less income, less time to spend) the extra money for one or two days in Nome and/or Kotzebue is not affordable and/or does not appear to provide a good product for the cost.	
Growth Potential (Number of Visitors in 2024)	
Low Case:	1,200
Medium Case:	1,780
High Case:	2,640

6.5.2 Strategies for Immediate Consideration

A. Strategic Relationships

Partner with Alaska Airlines

Intent: Work with the airline to identify how to improve the package tour and/or marketing so that cruise passengers perceive the tour as good value for the money.

Description: Develop a working relationship with Alaska Airlines' Seattle-based tour package planners, and help reinforce their marketing efforts. Also, develop surveys and /or other ways of getting feedback from participants on how to improve and market the tour.

Market to Tour Operators

Intent: The future visitation to Nome from this market is highly dependent on how this tour is marketed. It is likely that a significant number of tour participants will continue to be generated through the cruise lines. Other sources of visitors will need to be targeted to stem the decline in numbers experienced in recent years, both domestically and internationally, to encourage sales.

Description: Actively market this product to groups of tour operators, domestically and internationally.

B. Attractions

"In Town" Cultural Attractions

Intent: Enhance Nome's attractions close to town to add more value and interest to the tour.

Description: See page 6-5 and 6-6.

6.6 Hunting / Fishing

6.6.1 Projections

This sector attracts only a small number of visitors from outside the region. It has potential for expansion. However, growth depends on improved road access, marketing, and the availability of game and sport fish.

Table 6-7 Hunting/Fishing Tour Projections

Current Status	
Total estimated annual value	$240,000
Total estimated annual number of visitors	400
Estimated average length of stay	3
Estimated average per diem	$200
Current Trend	
Flat / down	
Growth Potential (Number of Visitors in 2024)	
Low Case:	400
Medium Case:	1,060
High Case:	1,880

6.6.2 Wait and See Strategies

A. Access and Strategic Relationships

Strategic Road Plowing and Marketing

Intent: Create a longer season when visitors can fish and hunt from the road system, and then market to targeted groups.

Description: Work with key interests (Alaska Department of Fish and Game, subsistence users, U.S. Fish and Wildlife Service) to determine if there is sufficient fish and game and public access to

warrant encouraging this sector. If so, plow the roads and market for spring grayling fishing (and birding) and fall hunting.

6.7 Business Travel

6.7.1 Projections

This sector is declining and will remain flat if the government service sector is reduced. However, Nome's role as a regional entity is an important part of the local economy and should be strengthened where possible. If high scenario projections are realized, much of the business travel will be related to mining.

Table 6-8 Business Travel Projections

Current Status	
Total estimated annual value	$480,000
Total estimated annual number of visitors	1,200
Estimated average length of stay	2
Estimated average per diem	$200
Current Trend	
Flat	
Growth Potential (Number of Visitors in 2024)	
Low Case:	1,200
Medium Case:	1,780
High Case:	2,640

6.7.2 Strategies for Immediate Consideration

Nome as a Regional Host

Intent: Encourage regional residents and entities to do their business and hold meetings in Nome.

Description: Anticipate ways to be a better host (e.g., help with meeting planning) and work to keep the cost of doing business in Nome competitive (e.g., off-season hotel discounts for conventioneers).

6.8 Winter Adventure

6.8.1 Projections

This is one of the few tourism sectors that is currently growing in the Nome area. Although it has a present estimated value of $180,000, winter adventure travel could potentially have a nearly five-fold increase in value over twenty years. This is ideal because it would help fill hotel rooms in the off-season, and requires few capital improvements.

What it does require to grow, however, is good marketing and a quality product. Poor snow conditions in southern Alaska for winter recreation (snowmobiling, skiing, etc.) could also work to Nome's advantage.

Table 6-9 Winter Adventure Tour Projections

Current Status	
Total estimated annual value	$180,000
Total estimated annual number of visitors	300
Estimated average length of stay	3
Estimated average per diem	$200
Current Trend	
Up	
Growth Potential (Number of Visitors in 2024) (Number of Visitors in 2024)	
Low Case:	300
Medium Case:	780
High Case:	4,410

In the Scandinavian tourism industry, creativity and exceptional service have been key to expanding the winter tourism market (see Figure 6-13, "Ice Hotel" photos; you can stay overnight, drink at the Ice Bar, take a sauna, or even get married in the Ice Chapel).

6.8.2 Strategies for Immediate Consideration

A. Attractions

Go Beyond the Iditarod

Intent: Create a winter tourism market niche for Nome that goes beyond the Iditarod. Nome could be an Alaskan winter adventure hot spot if a range of attractions were developed to go along with the obvious recreation opportunities (snowmobiling, dog sledding, skiing).

Description: Look at opportunities that could be developed in the region:

- A Hut-to-Hut system connected by snowmachine, skiing, and dog mushing trails.
- Winter-friendly facilities at Pilgrim and/or Serpentine Hot Springs–perhaps an ice hotel?

http://www.scantours.com/ice_hotel.htm

Figure 6-13 The "Ice Hotel" at Jukkasjärvi in Swedish Lapland

Partner with Alaska Airlines

Intent: Work with the airline to identify possibilities for marketing Nome as a winter destination in order to fill airplane seats in the shoulder season. An ice hotel and/or winter adventure in Nome (or even a winter package tour) could be advertised by the airline to enhance perceptions of the carrier as America's "northern" airline.

Description: Work with the Alaska Airlines Seattle-based tour package planners, and potentially get Nome tourism people on the airline's Air Advisory Board in order to find more ways to work together to build tourism, especially in the off-season.

Market to Tour Operators

Intent: The future visitation to Nome from this market is highly dependent on how this tour is marketed. Sources of visitors will need to be targeted, especially through groups of tour operators, both domestically and internationally, to encourage sales.

Description: Actively market this product to groups of tour operators, domestically and internationally, while also working to identify target audiences for marketing and a product that will sell.

Winter Ice Carving Festival

Intent: Nome knows how to do winter events. A successful ice festival in Nome before the Iditarod could bring travelers from around the world and create an attraction in the form of sculptures that would last the season, and possibly get noticed by the press at the Iditarod.

Description: Look into Fairbanks' successful event and explore possibilities for having a Nome ice festival. Perhaps Alaska Airlines would donate airline tickets for a few internationally known ice carvers to help kick-off a competition.

6.9 Expedition Cruise

6.9.1 Projections

This is a growing segment and although it is eighth in terms of the sector's local value ($90,000 per year currently and potentially $420,000 in 2024), it is a sector that should not be ignored. Cruise passengers have the financial means to come back to Nome as independent tourists if they are intrigued with the area, and in their short stay they spend an estimated $100 per person on Native arts and crafts and local goods and services. Most of the important ways to encourage this segment are relatively inexpensive because adequate port infrastructure is in place.

Table 6-10 Expedition Cruise Tour Projections

Current Status	
Total estimated annual value	$90,000
Total estimated annual number of visitors	900
Estimated average length of stay	1
Estimated average per diem	$100
Current Trend	
Up	
Growth Potential (Number of Visitors in 2024)	
Low Case:	700
Medium Case:	2,660
High Case:	4,220

6.9.2 Strategies for Immediate Consideration

A. Strategic Relationships

Work with Expedition Cruise Planners

Intent: Encourage cruise dockings in Nome by building helpful and friendly working relationships with staff from major expedition lines operating in the region.

Description: Keep communication lines developed and open so that cruise planners are encouraged to work Nome into their itinerary. Offer to help provide logistical support at the pre-cruise planning stage (e.g., scheduling), and once the cruise ship arrives, make sure the community is ready to welcome and meet the needs of cruise staff and passengers (e.g., coordinate timely water delivery, make sure gift shops and rest rooms are open to accommodate their tight schedule). As possible, help facilitate customs, immigration, and security checks.

B. Port

Improve Cruise Passengers Arrival and Departure Experience

Intent: DOT/PF should enable movement into town from the port and help create a "front door" to the community for cruise passengers.

Description: Develop pedestrian surfacing and basic amenities that are out of the way of cargo operations. This could include a local phone, visitor information, and rest rooms.

Timely Cruise Ship Water Delivery

Intent: Make water deliveries a priority for local service providers so cruise ships are not left waiting.

Description: Work with water delivery companies to help facilitate timely delivery.

C. Tourism Jobs

Cruise Supplies and Services

Intent: Determine if there are any goods or services that Nome can supply for the cruises. Most goods (food, supplies) are flown in by charter; there may be an opportunity to provide specialty items (king crab, seafood, fresh baked goods) or even basic supplies.

Description: Identify opportunities and ensure delivery.

6.9.3 Wait and See Strategies

D. Port

Construct a Port Water and Wastewater System

Intent: Allow timely water delivery to cruises and enable other services.

Description: Construct a system that meets cargo and cruise operators' needs.

Home Port a Dredge

Intent: Improve cruise ship access by home porting a dredge in Nome that could also be used to help with fuel delivery to surrounding communities, and potentially with dredging the mouth of the Yukon River to facilitate larger barges.

Description: The U.S. Army Corps of Engineers has a commitment to provide dredging of Nome's port twice a year and puts a contract out to bid. If a dredge were kept in Nome, scheduled improvements could help in maintaining depth by cutting off littoral drift. This would only be warranted if it were market driven.

Port Clarence / Grantley Harbor Deep Water Dock

Intent: Create an alternative deep water dock in the region to facilitate higher levels of cruise activity in all kinds of weather, and mining operations.

Description: If the expedition cruise sector becomes as successful in this region as in Antarctica, there may be an opportunity to extend cruise ships' stay, especially if major attractions are developed in the area.

If high-end growth occurs, Nome's port will be busier than at present, and an alternate port at Grantley Harbor with a deep water dock may facilitate growth of this sector and mining activities.

If the Ring Road connecting Teller with Pilgrim Hot Springs and Council is also developed, and the Kougarok Road extended to the Bering Land Bridge National Preserve, this harbor may offer a strategic staging point for expeditions and even larger cruise boat activities connected to the preserve.

All of these variables are highly speculative, and any successful project must be market driven. Brevig Mission has considered this option in its local 1998 economic development plan that lists a "Harbor and Dry Dock on Port Clarence" as development for future consideration.

6.10 Visiting Friends and Relatives

6.10.1 Projections

Currently, visiting friends and relatives (VFR) are estimated to spend $35 a day in the Nome area, a fairly low amount compared with tourists from other sectors.

This is low in part because of Nome's hospitality, and because of limited spending opportunities (restaurants, etc.). If VFRs can be encouraged to spend more money in the local economy, it will improve the impact of this sector locally. In the year 2024 for example, at $35 per day the value of VFRs in the high scenario is $141,400. At $100 per day, this rises to $404,000.

Table 6-11 Visiting Friends and Relatives Projections

Current Status	
Total estimated annual value	$105,00
Total estimated annual number of visitors	750
Estimated average length of stay	4
Estimated average per diem	$35
Current Trend	
Flat	
Growth Potential (Number of Visitors in 2024)	
Low Case:	750
Medium Case:	910
High Case:	1,010

6.10.2 Strategies for Immediate Consideration

VFR Specials

Intent: To encourage VFR travel to Nome, spend money, and have a great time.

Description: Businesses that offer flight-seeing, and other tourism-oriented goods and services could offer a VFR discount for friends and family of Nome residents. They may even find Nome residents coming along for the adventure.

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