Wiley Post/Will Rogers Memorial Airport

MASTER PLAN UPDATE

January 2014

Prepared for

State of Alaska
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& Public Facilities
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Acronyms and Abbreviations

AAC.......... Alaska Administrative Code
AASP .... Alaska Aviation System Plan
ABR.......... ABR, Inc. Environmental Research & Services
AC .... Advisory Circular
ACAIS .... Air Carrier Activity Information System
ACMP.......... Alaska Coastal Management Plan
ADCCED.......... State of Alaska Department of Commerce, Community and Economic Development
ADEC .... State of Alaska Department of Environmental Conservation
ADF&G .... State of Alaska Department of Fish & Game
ADNR.......... State of Alaska Department of Natural Resources
ADOL&WD.......... State of Alaska Department of Labor & Workforce Development
ADOT&PF .... State of Alaska Department of Transportation & Public Facilities
AHRS .... Alaska Heritage Resource Survey
AIDEA .... Alaska Industrial Development & Export Authority
AIP .... Airport Improvements Program
ALP .... Airport Layout Plan
AMBBA .... Alaska Municipal Bond Bank Authority
AMP .... Airport Master Plan
ANC.......... Alaska Native Corporation
ANCSA.......... Alaska Native Claims Settlement Act
APDES.......... Alaska Pollution Discharge Elimination System
APEB .... Aviation Projects Evaluation Board
APM .... Airport Planning Manual
ARC.......... Airport Reference Code
ARFF.......... Aircraft Rescue & Firefighting Facility
ASDA .... Accelerate Stop Distance Available
ASOS .... Automated Surface Observing System
ASRC .... Arctic Slope Regional Corporation
ASTAC .... Arctic Slope Telephone Association Cooperative
ASV .... Annual Service Volume
BBO.......... Buy-Build-Operate
BDO .... Build-Develop-Operate
BIA .... United States Bureau of Indian Affairs
BLM.......... United States Bureau of Land Management
BOEM .... Bureau of Ocean Energy Management
BOO.......... Build-Own-Operate
BOT .... Build-Operate-Transfer
BRL.......... Building Restriction Line
BRW .... Wiley Post/Will Rogers Memorial Airport
BTO .... Build-Transfer-Operate
BUECI.......... Barrow Utilities & Electric Coop Inc.
CEDS.. Comprehensive Economic Development Strategies
CFR .... Code of Federal Regulations
CIP.......... Capital Improvements Plan
CVRF.......... Coastal Villages Region Fund
CZMA .... Coastal Zone Management Act
DBO.......... Design-Build-Operate
DME.......... Distance-Measuring Equipment
DMVA .... Alaska Department of Military & Veterans Affairs
DPOR .... Division of Parks & Outdoor Recreation
EDA .... Economic Development Administration
EFH .... Essential Fish Habitat
EMAS .... Engineered Material Arrestor System
EPA.......... United States Environmental Protection Agency
FAA.......... Federal Aviation Administration
FEMA.......... Federal Emergency Management Administration
FIRM.......... Flood Insurance Rate Map
FSS.......... Flight Service Station
FY .... Fiscal Year
GA .... General Aviation
GCI .... General Communications, Inc.
GDP.......... Gross Domestic Product
GO .... General Obligation
GPS .... Global Positioning System
HAT.......... Height Above Touchdown
HIRL .... High-Intensity Runway Lighting
HUD.......... Heads-Up Display
IAP.......... Integrated Activity Plan
IATA .... International Air Transport Association
IFR.......... Instrument Flight Rules
IHLC .... Inupiat History, Language, and Culture
ILS .... Instrument Landing System
IMC .... Instrument Meteorological Conditions

ITA .... Individual Training Account
kWH .... kilowatt-hours
LDA .... Landing Distance Available
L_{DN} .... 24-Hour Day/Night [Noise] Level
LDO .... Lease-Develop-Operate
LOC .... Localizer
M&O .... Maintenance & Operations
MALSR .... Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
MW .... megawatts
NAAQS .... National Ambient Air Quality Standards
NAC .... Northern Air Cargo
NARL .... Naval Arctic Research Laboratory
navaids .... navigational aids
NDB .... Non-Directional Beacon
NEPA .... National Environmental Policy Act
NHPA .... National Historic Preservation Act
NLURA .... Northern Land Use Research of Alaska, LLC
NMFS .... National Marine Fisheries Service
NOAA .... National Oceanic & Atmospheric Administration
NPIAS .... National Plan of Integrated Airport Systems
NPR-A .... National Petroleum Reserve – Alaska
NR .... ADOT&PF Northern Region
NRHP .... National Register of Historic Places
NSB .... North Slope Borough
NWS .... National Weather Service
OCS .... Outer Continental Shelf
OFA .... Object-Free Area
OFZ .... Obstacle-Free Zone
OHA .... Office of History & Archaeology
OSV .... Offshore Supply Vessel
PAPI .... Precision Approach Path Indicators
PFC .... Passenger Facility Charge
PPP .... Public-Private Partnership
REIL .... Runway End Identifier Lights
RITA .... US DOT Board of Transportation Statistics
RNAV .... Area Navigation
ROD .... Record of Decision
ROW .... Right of Way
RPZ .... Runway Protection Zone
RSA .... Runway Safety Area
RVR .... Runway Visual Range
SAFO .... Safety Alert for Operators
SAR .... Search and Rescue
SCASDP .... Small Community Air Service Development Program
sf .... square feet
SHPO .... State Historic Preservation Officer
SIDA .... Security Identification Display Area
SREB .... Snow Removal Equipment Building
STEM .... Science, Technology, Engineering, and Mathematics
STEP .... State Training and Employment Program
STIP .... State Transportation Improvement Program
SWPPP .... Storm Water Pollution Prevention Plan
TAF .... Terminal Area Forecast
TALPA .... Takeoff and Landing Performance Assessment
TAR .... Total Area Ration
TDG .... Taxiway Design Group
THPO .... Tribal Historic Preservation Officer
TLUI .... Traditional Land Use Inventory
TODA .... Takeoff Distance Available
TORA .... Takeoff Run Available
TOS .... Thermal Oxidation System
TSA .... Transportation Security Administration
TVEP .... Technical Vocational Education Program
UAF .... University of Alaska Fairbanks
UIC .... Ukpeavik Inupiat Corporation
US DOT .... United States Department of Transportation
USACE .... United States Army Corps of Engineers
USC .... United States Code
USCG .... United States Coast Guard
USDA .... United States Department of Agriculture
USFWS .... United States Fish & Wildlife Service
VFR .... Visual Flight Rules
VMC .... Visual Meteorological Conditions
VOR .... VHF Omnidirectional Range
WHA .... Wildlife Hazard Assessment
WHMP .... Wildlife Hazard Management Plan
WIA .... Workforce Investment Act

Executive Summary

The Barrow Airport Master Plan Update is a comprehensive study of the airport. It compares the aviation demand with existing conditions and facilities to identify the need for future development. The plan describes development plans for the short (5-year), medium (10-year), and long (20-year) terms and provides the framework needed to guide future airport development cost-effectively while considering potential environmental and socioeconomic impacts.

This airport master plan is an update to the previous master plan developed in 2000. The first Barrow Airport planning document, the *Barrow Airport Development and Land Use Plan*, was completed in 1983. To assist in the development of this master plan update, three public meetings were held in Barrow, a steering committee was created, surveys were distributed to the public, and a project website was developed.

Background

Barrow Airport (BRW) is a state-owned, public-use airport that functions as a critical element of the transportation system of the North Slope. Barrow Airport provides regularly scheduled passenger air service to communities throughout the region, as well as the only regional connection to Ted Stevens Anchorage International Airport. In recent years, BRW has become increasingly important in the development of offshore oil and gas reserves, and as a base of assets for the US Coast Guard's efforts to monitor the Bering Strait.

Facilities

Future development at BRW was planned by translating the aviation demand forecasts (Chapter 3) into the specific type and quantity of facilities necessary to fulfill the needs at the airport (Chapter 4). Key recommendations include construction of new Maintenance & Operations facilities, expansion of the existing apron, additional leasing opportunities, and dedication of special land use areas for USCG.

To meet the identified needs, several alternative development scenarios were developed and analyzed (Chapter 5), culminating in the selection of a preferred alternative. Each alternative was evaluated using a set of criteria that included environmental impacts, safety, cost, operational efficiency, etc.

Implementation

The recommended implementation plan (Chapter 6) lays out the sequencing of the projected facility development needed to meet the airport's operational, safety, and economic development needs over the 20-year planning period. A summary of suggested projects follows.

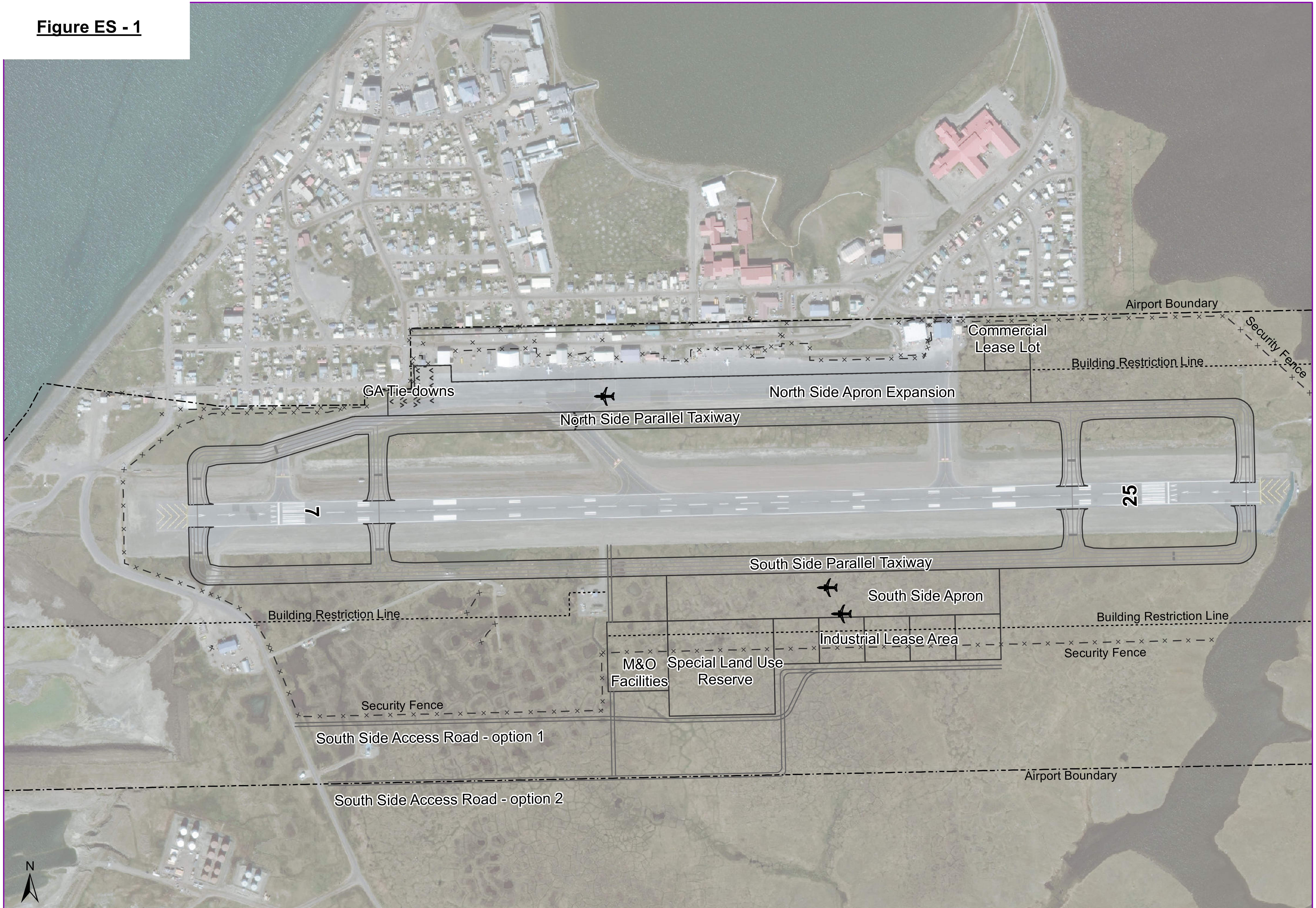
Table ES-1 – Project Phasing and Estimated Costs

	Project Description	Total Estimated Cost
Phase I: 2014-2019		
I-1	Runway Repair	$3.6 million
I-2	M&O Facilities	$13.5 million
I-3	Apron Expansion	$12.0 million
I-4	Stormwater Management Plan	$0.1 million
I-5	South Side Parallel Taxiway	$40.0 million
	Phase I Total	**$69.2 million**
Phase II: 2019-2024		
II-1	South Side Apron	$16.0 million
II-2	Master Plan & ALP Update	$1.5 million
II-3	ARFF/SREB Expansion	$1.5 million
II-4	Runway Repaving	$12.0 million
	Phase II Total	**$31.0 million**
Phase III: 2024-2034		
III-1	South Side Apron Expansion	$10.5 million
III-2	North Side Parallel Taxiway	$40.0 million
III-3	Apron Repaving	$5.7 million
III-4	BRL Shift and Lease Lot Expansion	N/A
III-5	Relocation of GA Tie-downs	$1.3 million
III-6	Ahkovak Street Realignment and Lease Lot Expansion	$13.5 million
	Phase III Total	**$71.0 million**

The full implementation of the master plan recommendations would require a $171.2 million commitment over the 20-year planning period. Based on current economic conditions and federal funding changes, implementation of the recommended improvements will require unique financing instruments with a keen eye toward leveraging every available funding source (Chapter 7).

As outlined in the master plan and the supplemental environmental report, there will be some environmental challenges related to any airport expansion. Of particular concern are the numerous wetlands throughout the area that will require impact mitigation and the prevalence of potential cultural sites that will require delineation and documentation.

Figure ES - 1



CONSULTANT:

PLANS DEVELOPED BY:
PDC, INC.

PROJECT:
Barrow Airport Master Plan Update
Barrow, AK

SHEET TITLE:
Ultimate Airport
Development Plan

DESIGN	PWC
DRAWN	PWC
CHECKED	RLC
DATE	JANUARY, 2014

PROJECT No.
12190FB

SHEET NUMBER
1
OF 1 SHEETS

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1 Introduction

1.1 What Is an Airport Master Plan?

An airport master plan is a comprehensive study of an airport that describes the short- (5-year), medium- (10-year), and long-term (20-year) development plans to meet future aviation demand. The goal of a master plan is to provide the framework needed to guide future airport development that will cost-effectively satisfy aviation demand, while considering potential environmental and socioeconomic impacts.

The general goals and objectives addressed by an airport master plan include the following:

- Provide a framework for long-range planning
- Graphically present preferred airport development concepts
- Define, in general terms, the purpose and need for development projects
- Identify facility requirements for all airport users
- Evaluate alternative solutions to meet the facility needs
- Comply with applicable FAA requirements
- Enable the airport to achieve its mission
- Assure compatible land use development
- Support the financial health of one of a city's most powerful economic engines

A successful master plan includes the following characteristics:

- ***Financially feasible:*** The phasing of the plan's capital projects should be aligned with identified need and the ability to secure available funding.
- ***Environmentally compatible:*** The plan should minimize potential environmental impacts.
- ***Balanced:*** The plan should maintain a balance between airport development needs and community impacts.
- ***Technically sound:*** The plan should comply with federal, state, and local requirements, and the capital projects should be able to be constructed efficiently and cost-effectively.
- ***Responsive:*** The plan should address the physical and operational needs of stakeholders.
- ***Flexible:*** The plan should consider changes in industry dynamics which will enable the entity that owns and manages the airport (at Barrow, this is the Alaska Department of Transportation & Public Facilities [ADOT&PF]) to be responsive.

The master plan process provides a blueprint for the future. The plan is just that, a plan, and will only be implemented as warranted by actual activity. The recommendations contained in a master plan are contingent upon further environmental study and financial feasibility.

Funding for the Barrow Airport Master Plan Update is being provided through an Airport Improvement Program (AIP) grant from the Federal Aviation Administration (FAA).

1.1.1 Issues Barrow Airport's Master Plan Must Address

Relevant issues were identified during the initial phase of the project. Discussions were held with the airport users, including air taxi and commercial operators and lease lot owners, as well as Barrow businesses and residents. Site inspections were conducted and previous airport studies reviewed. Comments came primarily through personal telephone conversations, e-mail correspondence, public meetings, and responses to questionnaires. Chapter 8 contains a summary of the public involvement program.

The issues to be addressed at Barrow Airport (BRW) include:

- Airport development south of the runway
- Proposed U.S. Coast Guard (USCG) and Department of Military and Veterans Affairs (DMVA) facilities
- Community expansion
- Increasing demand for lease lots
- Changing fleet mix
- Congestion on Ahkovak Street, just north of the airport
- Highest and best use of airport land

1.2 Barrow

Situated on the shores of the Chukchi Sea, the City of Barrow, population 4,974, is the northernmost city in the United States. Barrow has been inhabited since 500 A.D. During the late nineteenth century, commercial whalers set up a station in Barrow, and in the 1940s and 1950s, the US military installed a radar station and research center north of town.

The community has experienced net population growth since 2007 after several years of flat or declining population (Figure 1-1).

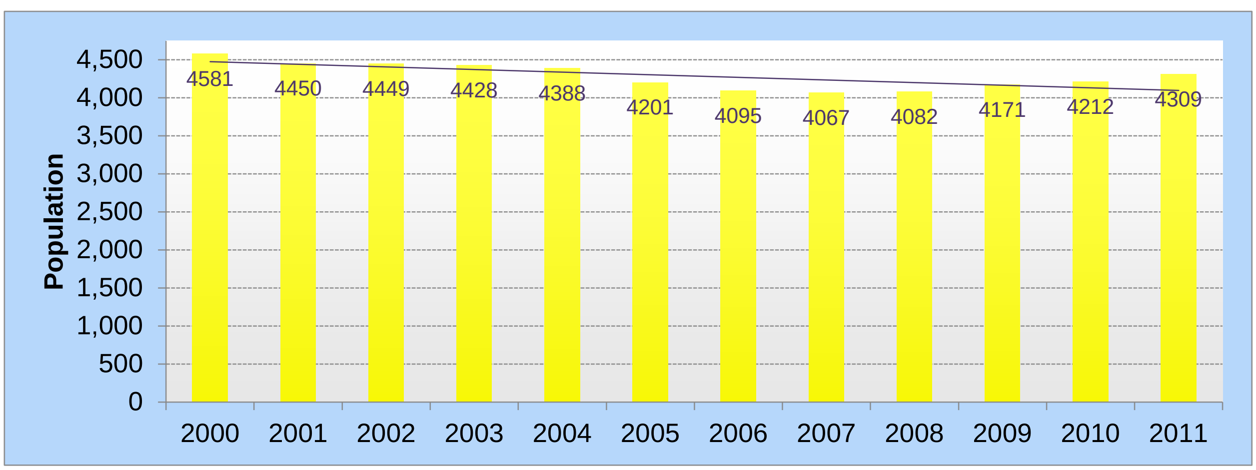

Figure 1-1 – Historic Barrow Population Estimates
Source: ADOL&WD (2013b) and Northern Economics, Inc. analysis

Due to its location, Barrow has seen several prominent aviation pioneers and explorers pass through:

- Roald Amundsen, 1926 blimp flight to the North Pole
- Ben Eielson, 1928 trans-arctic flight
- Charles and Anne Lindbergh, 1931 Orient surveying expedition

Today, Barrow is the supply, service, education, government, and transportation center of its region. It is the seat of government for the North Slope Borough (NSB). Incorporated in 1972, the NSB includes eight villages and over 89,000 square miles of land, making it the largest municipal subdivision in the United States. Likewise, Barrow is the corporate headquarters for the Arctic Slope Regional Corporation, the regional native corporation established under the Alaska Native Claims Settlement Act (ANCSA) of 1971. The ANCSA village corporation, Ukpeagvik Inupiat Corporation (UIC), as well as the regional native non-profit corporation, Arctic Slope Native Association, is also headquartered in Barrow.

Barrow’s location and existing infrastructure have made it a hub of arctic research, and the Barrow Arctic Science Consortium provides research facilities and field logistics for visiting scientists. Barrow is also seeing increased offshore oil and gas exploration activity in the Chukchi Sea.

1.2.1 Transportation

Barrow is the transportation hub for villages in the northwest Arctic, providing air links to the communities of Atqasuk, Wainwright, Point Lay, and Nuiqsut. Several air carriers provide scheduled service to Barrow from the outlying communities and the population centers of Fairbanks and Anchorage.

Marine transportation of goods to Barrow is limited to ice-free months in the summer. Barges land at a location north of town.

1.3 Barrow Airport (BRW)

The Barrow airfield was originally constructed in 1964 as a dirt and gravel strip long enough to accommodate small aircraft. The timeline below highlights milestones in the airport's history.

1960 Gravel runway construction begins

1964 Gravel runway completed (5,000 feet x 150 feet)

1968 Runway extended to 6,500 feet and paved

1974 Apron expanded

1983 Runway resurfaced; eastern end painted white to reduce permafrost thaw

2003 Expansion of gravel apron between Taxiways B and C

2012 Major runway reconstruction completed

The current configuration of the airport was completed in 2012. Improvements at this time included a new rotating beacon and localizer and a shift of the runway 210 feet south to accommodate required safety areas.

The Barrow Airport has supported regional oil and gas exploration and development throughout most of its existence. In 2012, Royal Dutch Shell began using the airport to transfer crews to offshore exploratory drilling platforms. Other oil and gas companies may begin offshore exploration as soon as 2014; however, this is subject to change.

The USCG is considering this airport as a seasonal base of operations to monitor arctic marine traffic and offshore oil and gas exploration.

2 Existing Conditions and Issues

The first step in the airport master planning process involves gathering information about the airport and its environment from a variety of sources. An inventory of current conditions is essential to the success of a master plan, since the information also provides a foundation, or starting point, for subsequent evaluations.

The inventory of existing conditions for the Barrow Airport Master Plan Update includes the following:

- Information pertaining to airport ownership and management, the general airport setting, transportation access, the airport's role in regional transportation, and airport history
- An overview of the area's airspace and navigational aids and procedures
- Descriptions of facilities and services now provided at the airport including a general description of airside, terminal, landside, and support facilities, as well as utilities and other infrastructure
- A summary of environmental and meteorological conditions at the airport
- Population and socioeconomic information for the geographic area where most of the passengers are coming from (Chapter 3)
- A review of historic and current airport activity (Chapter 3)

2.1 Issues

Several issues were raised during the initial phase of the project. These issues surfaced during discussions with airport users including air taxis, commercial operators, and lease lot owners, as well as Barrow businesses and residents; additionally, site inspections were conducted and previous airport studies reviewed. Comments came primarily through personal telephone conversations, e-mail correspondence, public meetings, and responses to questionnaires/online survey.

The following issues at the Barrow airport (BRW) were brought up during the investigation phase of the master plan. This is not an exhaustive list, but represents the major themes encountered.

- Development along the south side of the runway
- Proposed U.S. Coast Guard (USCG)/Department of Military & Veterans Affairs (DMVA) facilities
- Material source(s)
- Approach minimums
- Community expansion and continued access to areas south of the airport
- Lease lot demand
- Potential changes to fleet mix
- Congestion along Ahkovak Street
- Highest and best use of airport land
- Maintenance and operations (M&O) facilities
- Noise from increased helicopter operations

Barrow residents expressed the greatest concern with maintaining access to areas south of the airport for subsistence activities, recreation, and possible community expansion. Additionally, many residents commented on the vehicle congestion along Ahkovak Street during times when Alaska Airlines' flights are arriving. They were also concerned about noise from helicopters, particularly after the increased number of helicopter operations during 2012.

Air taxis and air carriers were most interested in obtaining additional lease space to accommodate their operations. Likewise, the USCG and DMVA are interested in developing a joint base of operations in Barrow but do not currently have a lease lot.

2.2 Regional Setting

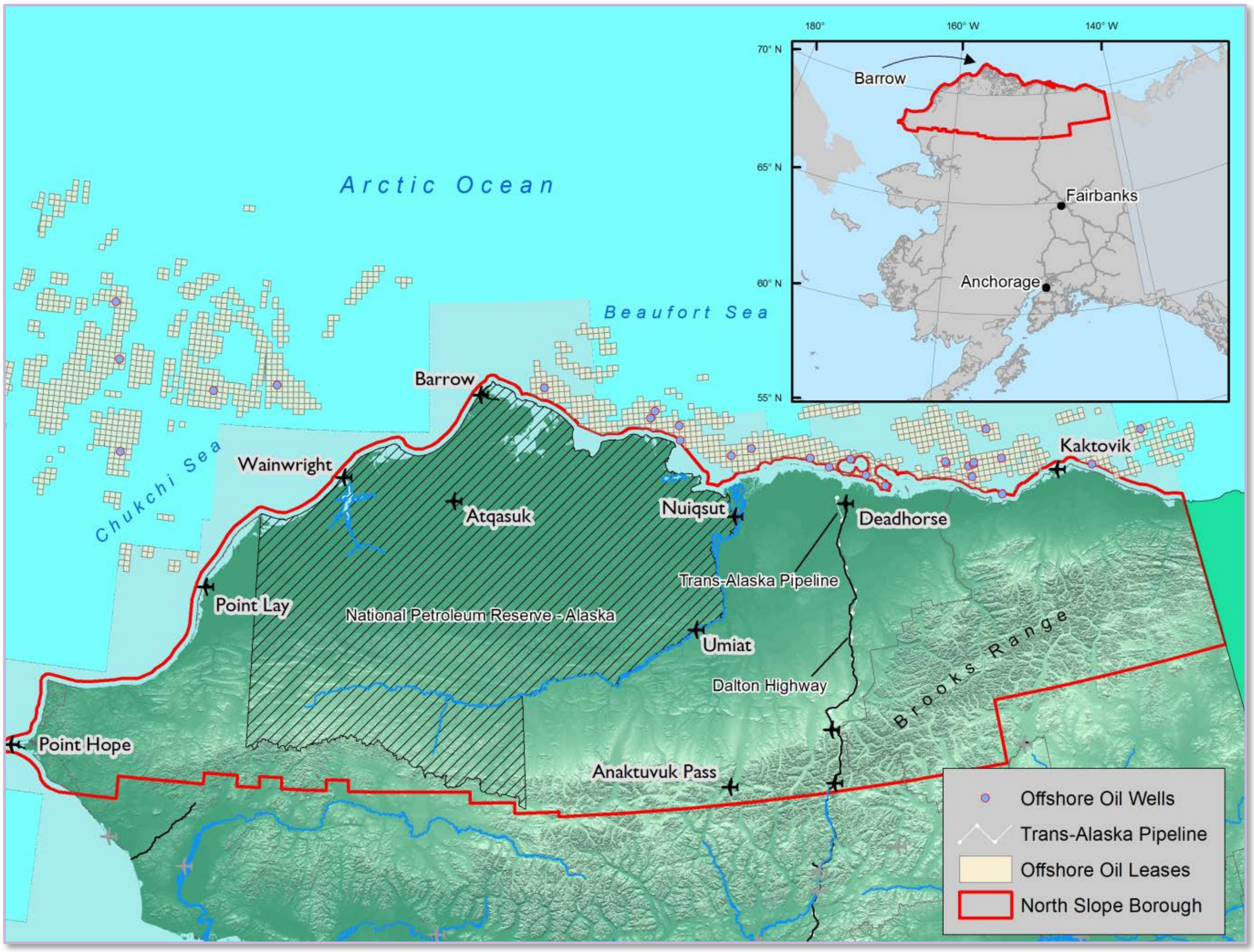

Figure 2-1 – Barrow and the North Slope Borough

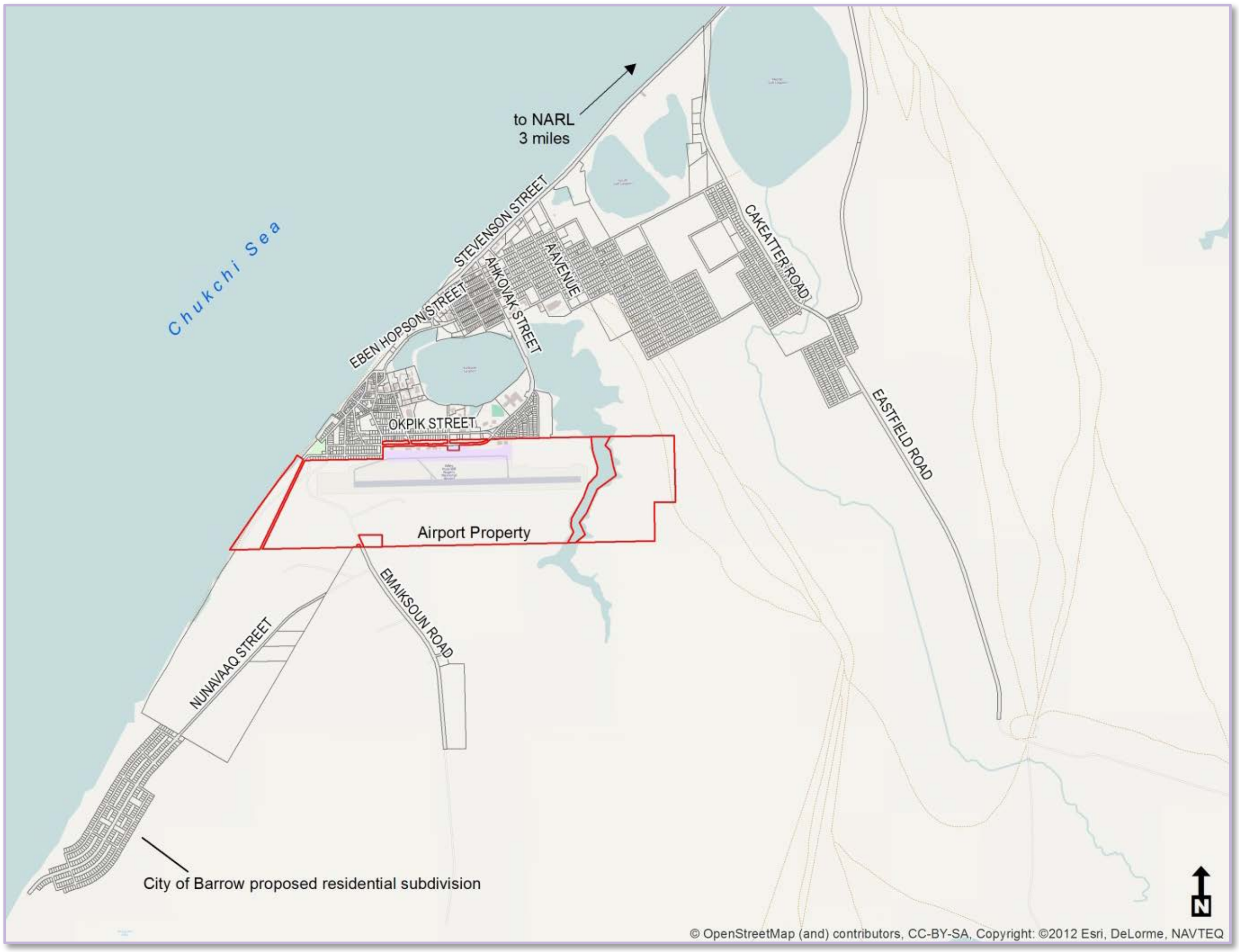

Figure 2-2 – Barrow Airport Location

The city of Barrow, population 4,974, is the northernmost city in the U.S. Situated on the shores of the Chukchi Sea (Figure 2-1), Barrow has been inhabited since 500 A.D. During the late nineteenth century, commercial whalers set up a station there, and in the 1940s and 1950s, the U.S. military installed a radar station and research center north of town. The Naval Arctic Research Laboratory (NARL) included an airstrip, laboratory facilities, and personnel housing. Today, the remaining former NARL facilities are used to support Ilisagvik College and Barrow-based research activities.

Barrow is on the Arctic Coastal Plain, an area of low tundra that stretches along the northern coast of Alaska and into Canada. The region is underlain by thick, continuous permafrost which creates a rich mosaic of thaw lakes during the short, cool summer. Precipitation is relatively low in this region. At 71° North, Barrow is above the Arctic Circle and experiences harsh winter weather, extended periods of daylight in summer and darkness in winter, and conditions typical of high-latitude communities.

Barrow's location and existing infrastructure have made it a hub of arctic research. The Barrow Arctic Science Consortium provides research facilities and field logistics for visiting scientists. Likewise, Barrow is seeing increased offshore oil and gas exploration in the Chukchi Sea as part of the Bureau of Ocean Energy Management's (BOEM) Outer Continental Shelf (OCS) leasing program. As such, Barrow's importance to the nation in supporting domestic oil production is growing.

In recent years, a relatively ice-free Arctic has meant more marine traffic in the region. This, coupled with the increased offshore oil exploration, has prompted the USCG to increase their presence in the Arctic. In 2012, the USCG kicked off Operation Arctic Shield by staging assets at Barrow Airport and conducting maneuvers out of Barrow.

Also due to its location, Barrow has seen several aviation pioneers and explorers pass through:

- Roald Amundsen, 1926 blimp flight to the North Pole
- Ben Eielson, 1928 trans-arctic flight
- Charles and Anne Lindbergh, 1931 Orient surveying expedition
- Wiley Post and Will Rogers (for whom the airport is named), 1935 Alaska tour that ended in a fatal airplane crash near Barrow

Following several years of flat or declining population, since 2007 Barrow has experienced net population growth of 1.7% (see Chapter 3).

2.2.1 Government

Barrow is the seat of government for the North Slope Borough (NSB). Incorporated in 1972, the NSB includes eight villages and over 89,000 square miles of land, making it the largest municipal subdivision in the United States.

The City of Barrow was incorporated in 1958 as a first-class city. Both the City of Barrow and the NSB are mayor-strong forms of government.

Barrow is also the administrative center of the North Slope Borough School District, which comprises 11 schools in eight communities.

Barrow is the corporate headquarters for the Arctic Slope Regional Corporation (ASRC), the regional Native corporation established under the Alaska Native Claims Settlement Act of 1971 (ANCSA). The ANCSA village corporation, Ukpeagvik Inupiat Corporation (UIC), and the regional Native non-profit corporation, Arctic Slope Native Association, are also headquartered in Barrow.

Two federally recognized tribes are located in Barrow: the Inupiat Community of the Arctic Slope and the Native Village of Barrow Inupiat Traditional Government.

2.2.2 Economy

Barrow is the supply, service, education, and transportation center of the North Slope. The local economy relies heavily on government employment; the NSB is the city's largest employer. The school district and Ilisagvik College also contribute significantly to the local workforce (see Figure 2-3).

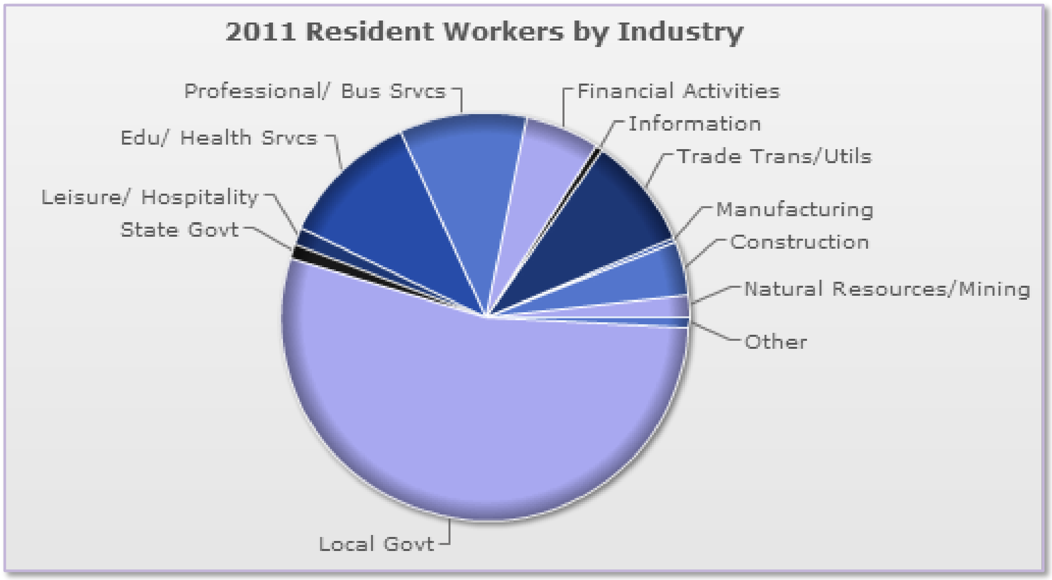

Figure 2-3 – 2011 Resident Workers by Industry

Source: Alaska Department of Labor and Workforce Development (ADOL&WD)

Much of the borough's wealth comes from oil and gas taxes. As North Slope oil production has decreased in recent years, the NSB's revenues have also diminished.

Barrow serves as a staging ground for offshore oil and gas development in the Chukchi Sea and western Beaufort Sea, and consequently, the number of jobs in the support industry has grown. There is potential for future oil and gas exploration in the western portion of the National Petroleum Reserve – Alaska (NPR-A) that could be supported from Barrow (see Figure 2-1). See Chapter 3 for a discussion of current on-shore and nearshore oil and gas exploration activities.

Tourism also provides economic opportunities to residents. Tourists visit Barrow in the spring and summer to view migrating birds and other wildlife and to experience the midnight sun and cultural events. In 2012, 17 cruise ships passed offshore of Barrow. While none of the passengers came ashore, there is potential for onshore excursions from future cruise ships and increasing USCG presence in the Arctic to monitor marine traffic.

Residents rely on subsistence food sources such as waterfowl, seals, whales, and caribou, which are harvested locally.

There is no sales tax in Barrow. However, the City collects a 5% bed tax, $1/pack cigarette tax, 12% tobacco tax, and 3% alcohol tax. The NSB collects a property tax of 18.5 mills.

2.2.3 Transportation

Several air carriers provide scheduled service to Barrow from the outlying communities and the population centers of Fairbanks and Anchorage. Chapter 3 discusses in detail the current air carriers serving the region, as well as the trends in passenger and freight volumes.

Barrow is the transportation hub for several villages in the northwest Arctic, providing air links to the following communities:

- Atqasuk
- Wainwright
- Point Lay
- Nuiqsut

Point Hope is generally served by air out of Kotzebue, while Anaktuvuk Pass and Kaktovik are served out of Fairbanks. Some flights between Fairbanks and Barrow include a stop in Deadhorse.

Marine transportation of goods to Barrow is limited to ice-free months in the summer. Barges land at a location north of town.

Barrow Airport (BRW)

The Barrow airfield was constructed in 1964. It was originally a dirt and gravel strip long enough to accommodate small aircraft. Today it is a 7,100-foot-long paved runway that supports daily passenger and cargo flights utilizing jet and propeller aircraft.

Major milestones in the airport's development include:

- 1960 – Gravel runway construction begins
- 1964 – Gravel runway completed (5,000 feet x 150 feet)
- 1968 – Runway extended to 6,500 feet and paved
- 1974 – Apron expanded
- 1983 – Runway resurfaced and east end painted white to reduce permafrost thaw
- 2003 – Gravel apron between Taxiways B and C expanded
- 2012 – Major runway and apron reconstruction completed

The recent reconstruction project included a new rotating beacon, new localizer, a shift of the runway 210 feet south, and displacement of the thresholds at each end. When complete, it brought the airport into substantial compliance with safety area standards.

Today, the Barrow Airport supports regional oil and gas exploration and development. Royal Dutch Shell began using the airport in 2012 to transfer crews to offshore exploratory drilling platforms. Other oil and gas companies may begin offshore exploration as soon as 2014, although this is subject to change.

The USCG is considering the airport as a seasonal base of operations to monitor Arctic marine traffic and offshore oil and gas exploration.

North Slope Aviation Infrastructure

Barrow's airport serves as the regional hub for four outlying communities: Wainwright, Point Lay, Atqasuk, and Nuiqsut (although Nuiqsut is occasionally served directly out of Fairbanks). These four community airports, as well as the airports in Anaktuvuk Pass and Kaktovik, are managed by the NSB. None of these communities is connected to the contiguous road system, so access is limited to air or marine/river transportation.

Passengers, cargo, and bypass mail destined for Wainwright, Point Lay, and Atqasuk are routed through Barrow. The table below summarizes the estimated bypass mail volumes for Barrow and associated communities. Roughly 8.7 million pounds of mail flows into Barrow annually. Most of that mail stays in Barrow, while approximately 1.8 million pounds continues on to outlying villages. Historic passenger and cargo volumes are presented in Chapter 3.

Table 2-1 – Bypass Mail Volumes for BRW, 2010

Source: Northern Economics, Inc.

Community	Volume (lbs)	Volume per capita (lbs.)
Atqasuk	401,000	1,721
Point Lay	436,000	2,307
Wainwright	971,000	1,746
Barrow	6,934,000	1,646
Total	**8,742,000**	**1,684**

Additionally, the Barrow airport is a staging area for offshore oil development in the Chukchi Sea. During the summer of 2012, Royal Dutch Shell stationed three helicopters in Barrow to support crew changes and search-and-rescue efforts and chartered Boeing 737-400 aircraft to transport crews between Anchorage and Barrow. The USCG also utilized Barrow Airport during 2012 to provide 24-hour search-and-rescue operations in the region and reduce response times to incidents in the Beaufort and Chukchi Seas. Before 2012, Royal Dutch Shell and other oil companies had been conducting activities necessary to obtain permits for the exploration work, including public outreach and scientific studies in the region.

Wainwright also plays a role in offshore oil development along the North Slope. Conoco Phillips and Statoil have indicated that they will use Wainwright as a base of operations for accessing their Chukchi Sea leases (see Chapter 3 for additional discussion).

The NSB also provides search-and-rescue and medevac services for the North Slope from a base at Barrow Airport. With two helicopters, a twin-engine airplane, and a jet-engine airplane, the NSB Search and Rescue (SAR) is a critical user of the region’s aviation infrastructure.

In addition to the public airports listed above, there are also several private airstrips and airports that are maintained and operated by oil companies. Most notable are the Alpine Airstrip and the Kuparuk Airport. Alpine is located 53 nautical miles west of Deadhorse and is owned by ConocoPhillips Alaska. Kuparuk Airport, located 28 nautical miles west of Deadhorse, has a 6,551-foot-long, 150-foot-wide asphalt runway.

2.2.4 Land Use and Ownership

Ownership

The bulk of the airport property (668.42 acres) was conveyed to the State of Alaska from the U.S. Bureau of Land Management (BLM) on February 13, 1968, under Patent No. 50-68-0175 (Lot 1, US Survey 4227). This parcel was conveyed pursuant to Section 16 of the Federal Airport Act of 1946. Additionally, the ADOT&PF has management rights for Tract I, Parcels A and C, of US Survey 4227 (see Figure 2-4).

Surrounding Property Land Uses

The airport property is zoned Industrial by the NSB. Adjacent to the north side of the airport property are areas zoned as Suburban and Multi-Use (Figure 2-4). The suburban area abuts the eastern end of the existing airport lease lots, including the NSB's SAR hangar and the airport's undeveloped Parcel E.

The airport property south of the runway contains extensive wetlands and is mostly undeveloped. There are an abandoned gas line (Figure 2-4) and potentially several cultural sites in this area. The National Weather Service (NWS) maintains a facility on the south edge of the airport property, adjacent to Emaiksoun Road.

Land south of the airport boundary is owned by UIC. UIC is currently developing a 75-man camp on their property south of the airport, with additional plans to develop industrial support facilities on this property. Proposed development includes offices, warehouses, fuel storage, and a "command campus" with 288 bunk rooms. Primary access to this property is from Emaiksoun Road, with development plans showing a central access road running through the property (see Figure 2-4).

The City of Barrow has long-term plans to develop an 85-acre residential subdivision southwest of the airport, off Nunavaaq Street approximately 1.5 miles east of the intersection with Emaiksoun Road (see Figure 2-2).

Directly east of the runway, bisecting undeveloped airport property, is the community's water supply, Isatkoak Lagoon. During the winter, the lagoon's frozen surface serves as an access corridor for subsistence activities to the south.

There are two active material sites west-southwest of the airport, one on airport property and one owned by UIC. Both are in an area zoned as Industrial. ADOT&PF is currently investigating additional sources of material.

On-Airport Land Uses

Aviation

Except for lots reserved by ADOT&PF, all existing lease lots with apron frontage are leased. Total lease revenues in 2012 were $145,358. Figure 2-5 shows the lease lots and Table 2-2 lists the current lessees and sublessees.

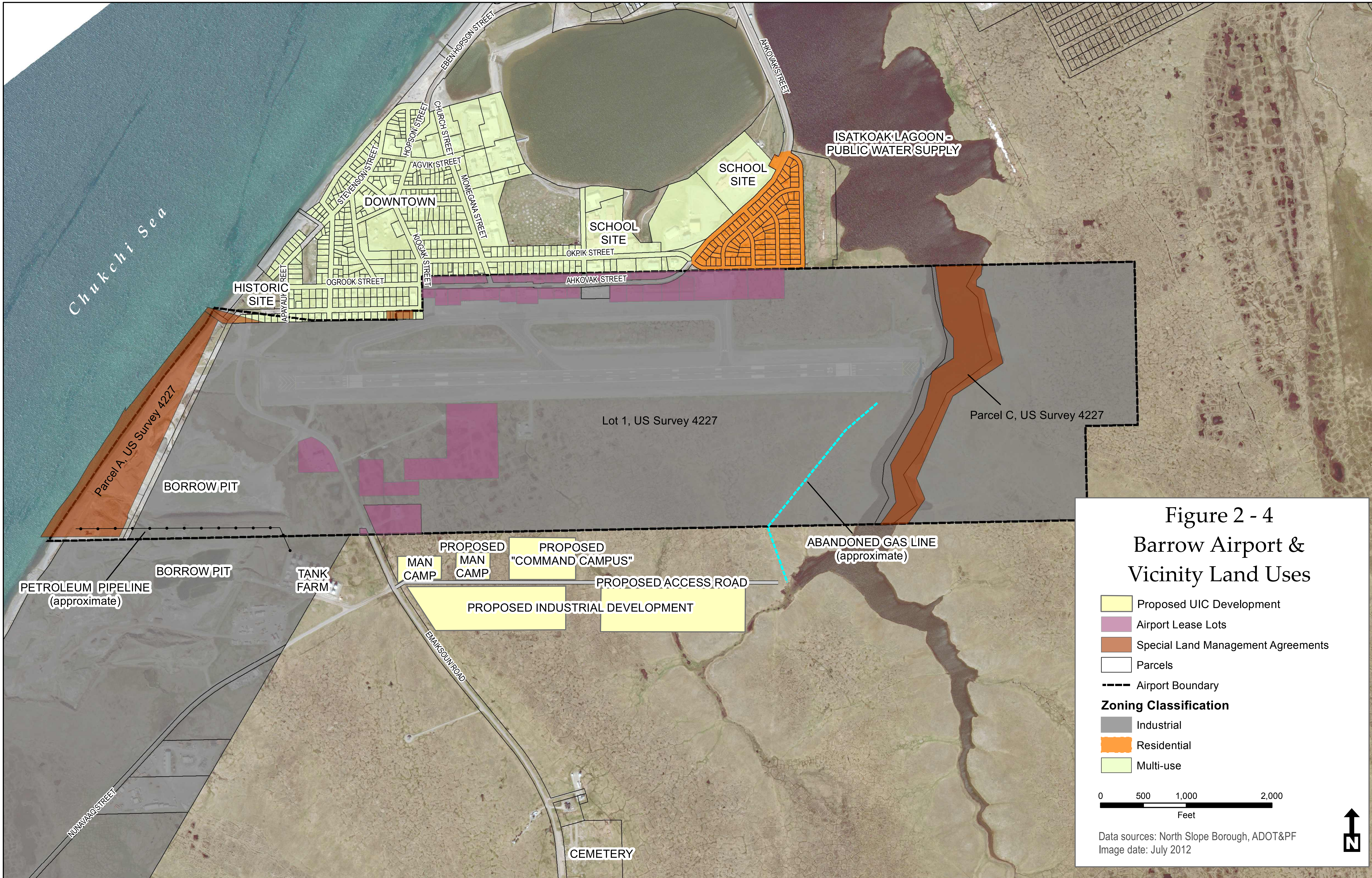

Figure 2 - 4
Barrow Airport & Vicinity Land Uses

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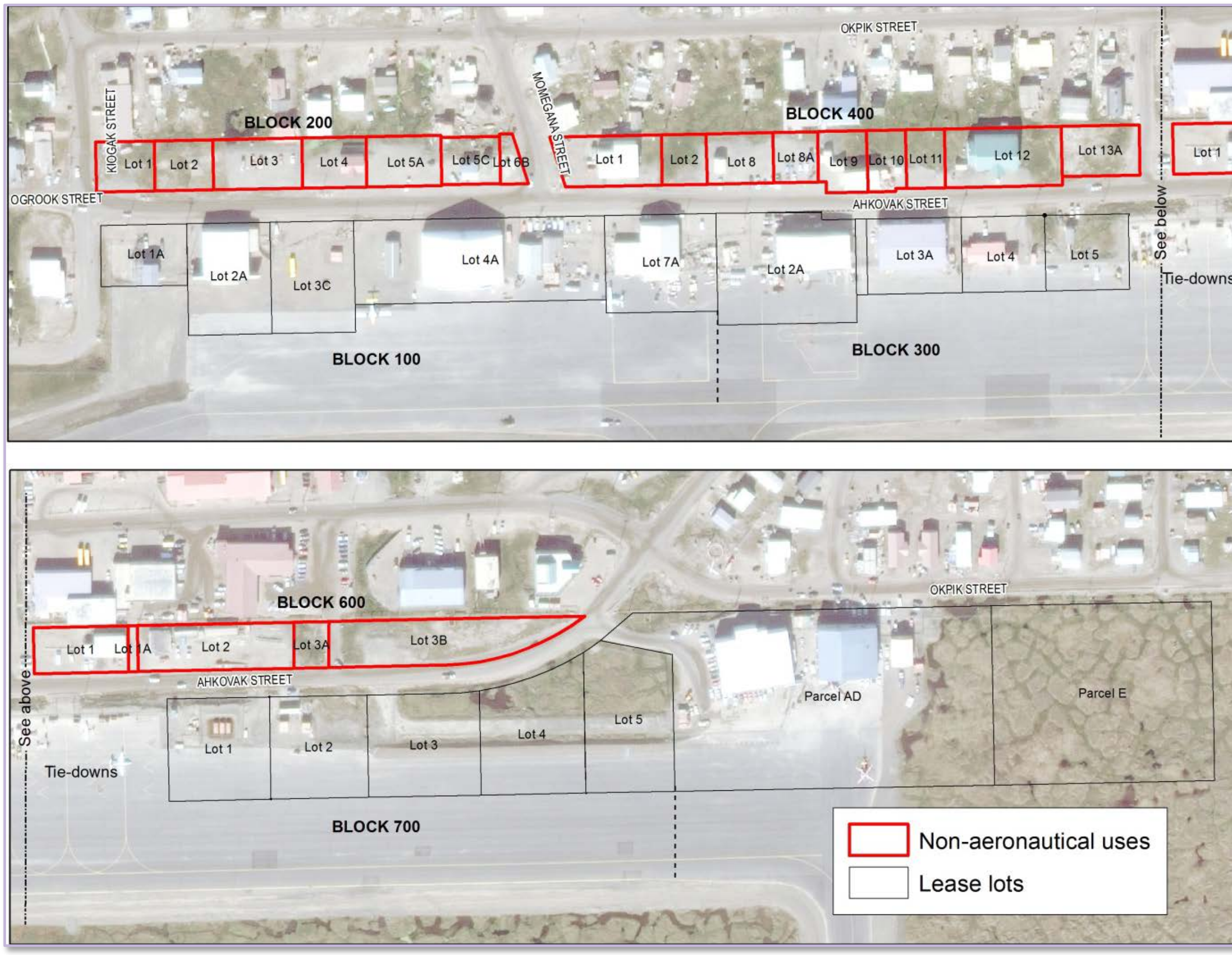


Figure 2-5 – Lease Lots

Table 2-2 – Primary Leaseholders and Sublessees at the Barrow Airport

Primary Leaseholder	Block	Lot	Sublessee (if any)
FAA	100 400	1A 9, 10	
Frontier Flying Service	100 300 700	2A, 3C, 4A 4 1	
Donald Olson Enterprises	100	7A	Hageland Aviation Service
North Slope Borough	200 600 Parcel AD	4 1A, 3A	
City of Barrow	200	5C	
Barrow Lions Club	200	6B	

Primary Leaseholder	Block	Lot	Sublessee (if any)
Alaska Airlines	300 400	2A 8A	
Hageland Aviation Service	300	5	
Arctic Slope Regional Corporation	400	1	
Cornerstone Investment	400	12	
UIC Real Estate	600	1	
SKW/Eskimos Inc.	600	2	
Gary Quarles	700	2	
Ryan Air	700	3, 4	
Clearwater Air	700	5	

Although most of the lots are developed, Lots 4 and 5 of Block 700 and Parcel E are undeveloped. Parcel E has been reserved by ADOT&PF for future facilities. However, five other entities have also expressed interest in leasing that parcel.

Development of lease lots at Barrow Airport is expensive due to the high costs of gravel, construction materials, and labor. Also, FAA imposes limitations on the use of airport lands for non-aviation purposes. Nevertheless, there is demand for apron-front lease space. Developable property within the city of Barrow is in short supply, which increases the demand for on-airport property. In 2012, six entities inquired about leasing airport property, and the NSB expressed a desire to use its closed transit terminal on Block 200, Lot 4, for additional office space.

Only one lease lot at the airport is currently subleased—Hageland Aviation service subleases Block 100, Lot 7A, from Donald Olson Enterprises. For the summer of 2012, Frontier Flying Service subleased Lots 2A and 3C on Block 100 to the USCG and Block 300, Lot 4, to Royal Dutch Shell. Hageland Aviation Service and Frontier Flying Service are both part of Era Alaska. Thus, Era Alaska controls six primary leases and one sublease, totaling more than 5.5 acres of apron frontage.

There is no tie-down program at BRW. Use of the tie-downs is on a first-come, first-serve basis (see Figure 2-5).

Helicopter operations fluctuate seasonally, with the greatest use in summer. The NSB SAR has two Bell 412 helicopters that operate year-round from the SAR lease lot on the east end of the apron. One Robinson-44 is based on the airport during the summer to provide charter services. During 2012, Royal Dutch Shell hired two contractors operating three Sikorsky helicopters (two S61's and one S92) to provide support for crew changes and search-and-rescue operations.

Commercial aircraft movements at BRW are concentrated in the center of the apron. This is because Hageland Aviation and Alaska Airlines are the primary passenger carriers at BRW, and their terminal facilities are adjacent to each other. Likewise, Era Alaska conducts ground handling operations for Northern Air Cargo, Everts Air Cargo, and Hageland Aviation in the Era hangar (which is part of the Hageland Aviation terminal). Section 2.3.1 below discusses the terminal facilities, and Chapter 3 provides detailed information on the operations and passenger enplanements.

During the summer, BRW sees an increase in transient aircraft activity related to scientific research. Often, aircraft such as Twin Otters operate from BRW for a couple of weeks at a time supporting research activities such as wildlife surveys or aerial photography. These transient aircraft park at the tie-down area of the apron (Figure 2-5).

Non-Aviation

The airport property encompasses several parcels on the north side of Ahkovak Street that are outside the security fence and do not have apron frontage. These parcels contain a variety of non-aviation-related facilities, including a hotel, an old bus terminal, parking lots, and a visitor information kiosk (see Figure 2-5). Additionally, the NSB's central receiving facility is located on airport property (Parcel AD).

As the airport sponsor, ADOT&PF is obligated under FAA Grant Assurance 22 to ensure that the airport is available for aeronautical uses. FAA must approve non-aeronautical uses of airport land. These uses must be justified, must not interfere with aeronautical activities, and must generate Fair Market Value revenue. Justification for non-aeronautical uses can include:

- Land is not currently needed for aviation/airport uses (e.g., far from airfield)
- Land is not needed for long-term aviation/airport uses
- Land cannot be used for aviation (e.g., separated from the airfield)

The benefit of allowing non-aeronautical land uses on airport property is that the land earns revenue rather than remaining fallow.

ADOT&PF's Leasing Section requests approval of non-aeronautical uses of airport property through written request to FAA. All non-aeronautical uses of lease lots at Barrow Airport have been approved by FAA.

2.3 Inventory of Existing Facilities

2.3.1 Airport Facilities

Airfield/Airspace

The current Airport Reference Code (ARC) for Barrow Airport is C-IV. The ARC is a coding system developed by the FAA to relate airport design criteria to the operational and physical characteristics of the airplanes operating at an airport. As such, it is part of the design standards established in the FAA Advisory Circular (AC) 150/5300-13a. In order to determine the appropriate ARC for an airport, a design aircraft is determined. The design aircraft is typically the most demanding aircraft (in terms of an airport's physical features) that conducts at least 500 annual operations at the airport. The ARC has two components relating to the airport design aircraft:

- Aircraft Approach Category (designated by a letter) is based on aircraft approach speed and typically affects runways and features relating to runway length.
- Airplane Design Group (designated by a Roman numeral) is based on airplane wingspan and primarily affects width-related features and separation from other facilities.

The FAA also classifies airports according to the amount of passenger service offered at the airport. These classifications are reported in the biennial National Plan of Integrated Airport Systems (NPIAS). Barrow Airport is classified as a Primary Non-Hub airport. "Primary" indicates that the airport is publicly owned, receives scheduled passenger service, and has more than 10,000 passenger boardings annually. "Non-Hub" means that even though more than 10,000 passengers pass through the airport, the total number is less than 0.05% of total U.S. passenger enplanements.

FAA outlines the standards and recommendations for airport features in AC 150/5300-13a. This document gives the geometric layout and engineering design requirements for runways, taxiways, aprons, and other airport facilities. The current version of the AC took effect in September 2012. The following section summarizes the current airfield dimensions at Barrow Airport and how they meet or differ from FAA standards. A detailed discussion of the required airfield and airspace dimensions based on the design aircraft and adherence to FAA standards is presented in Chapter 4, *Facility Requirements*.

Runway

Barrow Airport has a single, paved runway (7-25) that is 7,100 feet long and 150 feet wide. Each threshold is displaced 600 feet. "Elephant ears" at each end of the runway allow large aircraft to turn around. Table 2-3 below summarizes the runway's declared distances.

Table 2-3 - BRW Declared Distances

Measurement	Declared Distance (feet)
Takeoff Run Available (TORA)	7,100
Takeoff Distance Available (TODA)	7,100
Accelerate Stop Distance Available (ASDA)	6,500
Landing Distance Available (LDA)	5,900

The runway pavement is in fair condition, with heaving, cracking, and asphalt degradation occurring along the entire length. There is also a substantial bump in the runway near the Runway 7 threshold. Table 2-4 summarizes the runway load bearing capacity.

Table 2-4 – Runway Load Bearing Capacity by Wheel Type

Source: FAA Form 5010

Wheel Type	Gross Weight (lbs)
Single Wheel	75,000
Dual Wheel	160,000
Dual Tandem Wheel	300,000

Taxiways

There are three equally sized (75-foot-wide) taxiways connecting the apron to the runway:

- Taxiway A connects to the Runway 7 threshold.
- Taxiway B enters at the midpoint of the runway.
- Taxiway C connects to the runway approximately 1,400 feet from the Runway 25 threshold.

Medium Intensity Taxiway Lighting delineates the edges of all taxiways.

Apron

Barrow Airport has a single paved apron covering approximately 620,000 square feet. On the south side of the apron is a designated 75-foot-wide taxilane.

Several tenants report that the apron has several dips and swales. In fact, Alaska Airlines indicated that because of the slope in the apron they must park their B737-400 Combi aircraft pointing west to avoid difficulty in offloading cargo containers.

Runway Safety Areas

FAA design standards for an ARC C-IV runway specify that the runway safety area (RSA) be 500 feet wide, extend 1,000 feet beyond the departure end of the runway, and extend 600 feet prior to the approach end of the runway. Following the completion of the recent runway shift, paving, and displaced thresholds, the Barrow Airport RSA met these standards except that the RSA beyond Runway 7's departure end is only 800 feet long.

The increase in impervious surfaces from the recent expansion of the RSAs and aprons has made the volume of water flowing over the embankment problematic, as it has begun to erode the runway and apron embankments. At lower latitudes, this could be prevented by planting grass on the embankments. In Barrow, however, it takes considerably longer to establish a ground cover due to the arctic conditions.

Obstacle-Free Zones

The obstacle-free zone (OFZ) encompasses the most critical airspace adjacent to a runway. FAA standards dictate that no fixed objects may penetrate the OFZ except for runway lights and certain navigational aids that must be located near the runway. Any such equipment must be on frangible mounts. Also, no part of a taxiing or parked airplane may extend into the OFZ while another airplane is using the runway.

The OFZ dimensions vary depending upon the size of aircraft served and the visibility minimums of any associated instrument approach.

Object Free Area

The object-free area (OFA) clearing standard requires that the OFA be clear of above-ground objects. However, unlike in the OFZ, objects for air navigation or aircraft ground maneuvering purposes may be placed within the OFA, and aircraft may taxi and hold there.

Building Restriction Line (BRL)

The building restriction line (BRL) defines the limits of development of all on-airport buildings. The FAA *Airport Design* Advisory Circular does not establish standard setback distances for BRLs. Rather, the FAA recommends that the BRL encompass the runway OFA, runway protection zone (RPZ) areas, areas required for clear line-of-sight, and navigational aid critical areas. Although FAA offers only limited guidance on defining the appropriate location for BRLs, many airports use FAR Part 77 imaginary surfaces.

The BRL at Barrow Airport is 910 feet from the runway centerline.

Navigational Aids

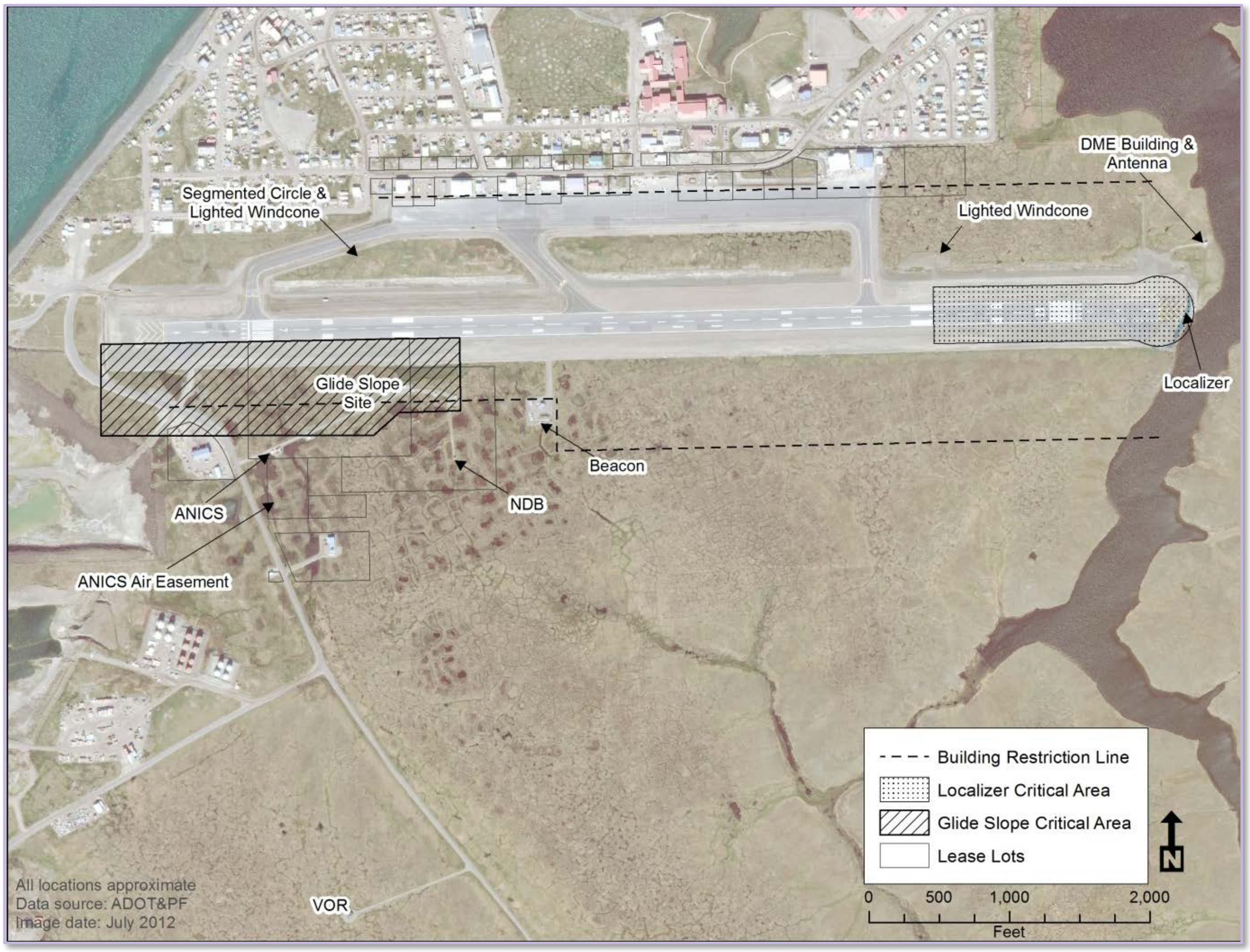


Figure 2-6 – Barrow Airport Navaids, Critical Areas, and Safety Areas

Approaches and landings at BRW are assisted by the terminal area navigational aids (navaids). Navaids in place at Barrow include radio navaids used for instrument approaches and visual aids used for both instrument and visual approaches (see Figure 2-6).

The Instrument Landing System (ILS) at Barrow supports a Category I precision instrument approach for Runway 7. The ILS system includes a localizer (LOC), glide slope equipment, and distance measuring equipment (DME). Runway 7 has a medium intensity approach lighting system with runway alignment indicator lights (MALSR). A runway visual range (RVR) finder measures the visibility, which is broadcast to the pilots. The non-directional beacon (NDB) “Browerville” (approximately 950 feet south of the runway) and the “Barrow” Very High Frequency Omni-Directional Radio Range (VOR)/DME (approximately 4,200 feet south of the runway) are radio navaids that support instrument approaches to BRW.

Figure 2-7 - Existing Airport Layout

1. Flight Service Station
2. Alaska Airlines Terminal
3. ARFF Building
4. NSB Search & Rescue
5. GA Parking & Tie-downs
6. Segmented Circle
7. Regulator Building & Beacon
8. Lighted Windcone
9. National Weather Service
10. ASOS
11. Public Parking
12. VOR
13. Era Alaska Terminal

Visual approach navaids at BRW include high-intensity runway lighting (HIRL), four-light precision approach path indicators (PAPI) on each runway end, and runway end identifier lights (REIL) on Runway 25. Other navigational aids include the airport beacon, segmented circle, and two lighted wind cones (see Figure 2-7).

Other air support facilities at BRW include a flight service station (FSS), an Automated Surface Observing System (ASOS) weather station, and weather cameras whose output is hosted on the FAA website (http://akweathercams.faa.gov/index.php).

The *U.S. Terminal Procedures – Alaska* publication includes instrument approach procedures for both runways.

Table 2-5 – Published Instrument Approaches at BRW

Runway	Lowest Published Visibility Minimum	Number of Published Instrument Approaches	
		Precision	Non-Precision
7	2,600 feet / 1,800 feet	1	1
25	One mile	0	3

Runway 7 has a straight-in ILS approach with 2,600 feet minimum RVR, or 1,800 feet for aircraft with heads-up display (HUD) or autopilot to decision altitude. Decision altitude is the lowest the aircraft can fly without the runway in sight. For this approach at Barrow, the decision altitude is 252 feet, which equates to a height above touchdown (HAT) of 200 feet. These are the lowest published minimums for BRW. Runway 7 also has an Area Navigation (RNAV) global positioning system (GPS) approach with a decision altitude of 302 feet (250-foot HAT) and a minimum of 2,800 feet RVR.

Runway 25 has an RNAV (GPS) approach with visibility minimums as low as one mile, a back course LOC/DME approach with visibility minimums as low as 1½ miles, and a VOR/DME approach with visibility minimums as low as 1 mile.

Approach Surfaces

The current approved Airport Layout Plan (ALP) shows that the Runway 25 approach is free of obstructions other than the DME antenna, which is fixed by function. The ALP indicates that the Runway 7 approach has one obstruction (a power pole) in the approach surface. Both runways have 50:1 approach slopes. The FAA Flight Procedures office has indicated that the HAT for the Runway 7 GPS approach will be reduced to 200 feet in the next FAA publication. This is due to a change in FAA policy. Otherwise, there are no changes expected for Barrow approaches.

Lighting, Marking, and Signing

The table below summarizes the runway lighting and markings at Barrow Airport.

Table 2-6 – Barrow Airport Runway Lighting

Runway	Approach Lighting	Runway Edge Lighting	Centerline Lighting	Marking[1]
7	MALSR, PAPI	HIRL	Recessed	PI
25	PAPI, REIL			NPI

Guidance signs provide the ability to easily determine the designation or name of taxiways and runways. The Barrow Airport signage meets these needs.

Commercial Passenger Terminal Facilities

Figure 2-8 – Alaska Airlines' Barrow passenger terminal

All passenger terminal facilities at BRW are maintained by individual airlines or tenants—currently Alaska Airlines, Era Aviation, and Royal Dutch Shell (seasonally).

[1] PI = Precision Instrument approach; NPI = Non-precision Instrument approach

At nearly 10,000 sf, the Alaska Airlines terminal is the largest passenger terminal facility at BRW. The two-story facility, which was built in 1998, includes a Transportation Security Administration (TSA) passenger screening area, a baggage claim, a cargo services counter, three passenger ticket stations, three self-serve kiosks, a passenger waiting area, and restrooms. The attached garage provides space for equipment and cargo. The second story houses offices and rooms for equipment and supply storage. Employees park on the west side of the building. Alaska Airlines staff report that there is not enough room to store all of their equipment inside the building, so they must keep some equipment on the apron. Alaska Airlines is investigating options for expanding the terminal.

Era Aviation's terminal building is approximately 9,500 sf (2,500 sf of customer service area and a 7,000 sf garage) and includes 8 linear feet of passenger ticket counter space, 8 linear feet of cargo services counter space, a passenger waiting area, a baggage claim, and restrooms. The attached garage holds equipment and cargo. There is a small vehicle parking area on the north side of the building. As a FAR Part 135 operator, Era Aviation is not required to screen passengers; thus, there are no TSA facilities or screening areas in this terminal.

Royal Dutch Shell currently sub-leases a terminal building from Hageland Aviation Services to support their seasonal, 88-passenger 737-400 charter flights from Anchorage. The building is approximately 3,000 sf and includes passenger waiting and screening areas, with security screening provided by a TSA-certified contractor. The terminal is operated only in the summer and fall, when offshore oil exploration is occurring.

General Aviation (GA)

Private aircraft ownership is less common in Barrow than in other Alaska communities of similar size. As of February 2013, the FAA aircraft registry shows only 11 aircraft registered to individuals in Barrow. During a site visit in February 2013, only two small aircraft were tied down at the airport.

The ADOT&PF Leasing Section does not have a tie-down program at BRW. However, there are 15 designated paved tie-down spaces available on the apron, and an additional four tie-down spaces in front of the FSS (see Figure 2-7). The paved tie-down area is approximately 50,000 sf, while the FSS tie-down area is approximately 20,000 sf. FSS personnel report a maximum of four transient aircraft and four based aircraft during the summer. Transient aircraft often remain at BRW for several days to support research activities. Winter GA operations are essentially nonexistent due to the extended periods of darkness and difficult environmental conditions.

Cargo

Figure 2-9 – Era Aviation Cargo Handling Facility at BRW

Alaska Airlines, Northern Air Cargo (NAC), Everts Air Cargo, and Hageland Aviation Services were the top four cargo carriers in 2011 (see Chapter 3 for historic and projected cargo volumes). Alaska Airlines handles their cargo shipments in-house, while NAC, Everts, and Hageland share facilities in BRW. Ground handling operations at BRW for NAC, Everts, and Hageland are conducted by Era Alaska in their existing facilities on Block 100, Lot 7A.

Security

A security fence runs along the north and west sides of the airport (Figure 2-7). The fence varies in height from 12 feet to 6 feet. It has 16 gates, three of which are electronic (badge-activated), while the remaining 13 have key-operated manual locks. The fence and gates were installed in 2012. ADOT&PF staff report that security fencing on the Runway 7 end is subject to snow drifting.

The TSA screens passengers inside the Alaska Airlines terminal building. Passengers pass from the open terminal through metal detectors to the sterile area before crossing the apron and boarding the aircraft. Passenger carry-on bags go through an X-ray machine. The TSA administrative offices are located in downtown Barrow, off airport property.

TSA-approved security badges are required for all personnel in the Security Identification Display Areas (SIDAs). SIDAs are marked on the apron pavement in two places at BRW:

- Alaska Airlines terminal (Block 300, Lot 2A)
- Era Alaska terminal, which is used by Era Aviation, Hageland Aviation, Frontier Flying, and Northern Air Cargo (Block 100, Lot 7A)

ADOT&PF maintains the “Airport Certification Manual” with copies in Fairbanks, Barrow, and one for the FAA. The current manual was reviewed in Barrow on February 1, 2013.

Support Facilities

Fueling

SKW/Eskimos, Inc. provides on-airport fuel services via in-the-wing fueling from trucks. SKW/Eskimos operates from its lease lot on Ahkovak Street (Block 600, Lot 2). There are no operable self-fueling facilities at the airport. There is an old self-service pump adjacent to the GA tie-downs, however it has been out of service for several years.

Weather Reporting and Flight Services

The National Weather Service (NWS) maintains a weather station with a staff of five forecasters at the airport, as well as an automated surface observing station (ASOS) located east of the apron (see Figure 2-7).

An FAA Flight Service Station (FSS) on the west end of the apron (Figure 2-7) provides pilot briefings and aircraft advisories, as well as weather reports when NWS staff are unavailable. The FSS is staffed from 6:00 a.m. until 10:00 p.m. daily. Table 2-7 presents the aircraft advisory history for the last six years. FSS staff issue an aircraft advisory any time a pilot contacts the FSS. The FSS also houses the personnel who maintain FAA navaids. The FSS facilities were recently remodeled, and there are no plans for additional expansion.

Table 2-7 – Historic FSS Aircraft Advisories

Year	Number of Aircraft Advisories
2007	13,570
2008	12,622
2009	11,618
2010	11,283
2011	10,907
2012	12,060

Ground Transportation Services

There are two rental car vendors on airport property, Ukpeagvik Holdings (a subsidiary of UIC) and the King Eider Inn. The King Eider has a fleet of five vehicles, while UIC has six vehicles on offer. The King Eider Inn is on Block 400, Lot 12, and UIC rents vehicles from a facility on Block 600, Lot 1 (see Figure 2-4).

Several cab companies provide transportation throughout Barrow. Taxi fares are set by the City of Barrow.

There are no public transportation options available in Barrow. The NSB bus system was discontinued in 2005.

Hotels

There are three hotels in the City of Barrow, all within ½ mile of the airport terminal area. The King Eider Inn is located on airport property and operates as an airport concession.

Access, Circulation, and Parking

The airport is on the south side of the community, adjacent to Ahkovak Street, which provides access to the terminal and cargo areas. Businesses and residences abut the airport property. Kiogak Street and Momegana Street are the primary north/south routes from downtown Barrow. The NSB maintains these roads, even where they cross airport property (see Figure 2-7).

As the primary access to the passenger terminals at BRW, Ahkovak Street gets congested, particularly when Alaska Airlines flights arrive. Ahkovak Street also suffers from several other issues:

- Poor drainage
- Deteriorating surface
- Proximity of buildings and businesses (especially the Alaska Airlines terminal)

There is a project in the 2012-2015 Statewide Transportation Improvement Program (STIP) to address the problems with Ahkovak Street. It will rehabilitate and pave approximately 0.625 miles of Ahkovak Street from Okpik Street to Kiogak Street, including drainage improvements.

Oil exploration has also led to increased congestion around the terminal area. Oilfield workers are transported to/from the Shell terminal to off-airport facilities via buses. The buses contribute to the already congested terminal area on Ahkovak Street.

Access to the NSB SAR hangar is via Okpik Street. There is parking for vehicles on the north side of the hangar. The NSB central receiving facility is on the same parcel as the SAR hangar, although it is outside the security fence. Access to central receiving is via a short driveway off Ahkovak Street.

There are three designated public parking lots on the north side of Ahkovak Street and limited parking is available directly in front of the Alaska Airlines terminal.

- Block 200, Lot 3 – 14,400 sf
- Block 200, Lot 5A – 12,600 sf
- Block 400, Lot 8 – 10,800 sf

There is also a 7,200 sf informal parking lot in Block 400, Lot 8A, that is leased by Alaska Airlines. Era Alaska has a small parking lot on the north side of their terminal, and there is parking for several vehicles adjacent to the FSS.

2.3.2 Utilities

Utilities serving the Barrow airport include water, sewer, electricity, telephone, natural gas, and solid waste disposal. The providers of the utility services are listed in Table 2-8.

Table 2-8 – Utility Service Providers at BRW

Utility	Provider
Water	Barrow Utilities & Electric Coop Inc. (BUECI)
Sewer	Barrow Utilities & Electric Coop Inc. (BUECI)
Electric Service	Barrow Utilities & Electric Coop Inc. (BUECI)
Natural Gas	Barrow Utilities & Electric Coop Inc. (BUECI)
Telephone	Arctic Slope Telephone Association Cooperative (ASTAC), GCI
Data	Arctic Slope Telephone Association Cooperative (ASTAC), GCI
Solid Waste Disposal	North Slope Borough

Water

Water is pumped from the Isatkoak Reservoir to BUECI's water treatment plant, where a microfiltration/ nanofiltration system removes minerals, solids, and potentially pathogenic bacteria. BUECI has a water storage capacity of 1.5 million gallons and can process up to 345,000 gallons per day. Current water utility rates are listed in Table 2-9. Water service is available to all airport tenants.

Table 2-9 – Water Utility Rates

	Basic Charge	Per-Gallon Charge
Potable Water		
Pipeline Customers	N/A	$0.0225
Potable Haulers	$168.75	$0.0225
BUS Water		
Residential (Non-Senior)	$55.00	0 – 3,000 gal: No charge > 3,000 gal: $0.02
Residential (Senior)	$11.00	0 – 3,000 gal: No charge > 3,000 gal: $0.02
All Others	N/A	$0.0800
Non-Potable Water		
Haulers	N/A	$0.0200
Fire Protection	$609.00	N/A

Sewer

BUECI operates the wastewater collection and treatment system. Wastewater flows to pump stations throughout the village and is eventually pumped to a facultative lagoon system. After testing to ensure pH, dissolved oxygen content, fecal coliform, total suspended solids, bio-chemical demand, and color meet the limits set by the Alaska Department of Environmental Conservation (ADEC) Discharge Permit, the processed water is discharged to the ocean. Current sewer utility rates are listed in Table 2-10. Sewer service is available to all airport tenants.

Table 2-10 – Sewer Utility Rates

BUS Sewer	Basic Charge	Gallon Charge (<3,000 gallons)
Residential (Non-Senior)	$14.00	N/A
Residential (Senior)	$3.00	N/A

Electric

BUECI operates seven generators with a maximum total production capacity of 20.5 megawatts (MW). The generators use natural gas as their primary fuel but can be operated using diesel in emergency situations. BUECI has "Double Firm Power" generation capacity, meaning the system can generate roughly double the peak demand. See Table 2-11 for current electric service rates.

Table 2-11 – Electric Service Rates

BUECI Electric	Basic Charge	Per kWH Energy Charge
Single-Phase	$14.55	$0.0961
Three-Phase	$89.67	$0.0956

Natural Gas

BUECI furnishes natural gas through a steel-and-HDPE pipe network throughout Barrow. Gas is available to the north side of the airport property along Ahkovak Street, Okpik Street, and D Street. There is no distribution system available on the south side of the runway. Table 2-12 lists natural gas rates.

Table 2-12 – Natural Gas Rates

BUECI Natural Gas	Basic Charge	Cubic Foot Charge	
Natural Gas (All Customers)	$18.05	0-55 ccf >56 ccf	No charge $0.2882 per ccf

Telephone/Data

Arctic Slope Telephone Association Cooperative (ASTAC)

ASTAC provides telephone and internet services to the north side of the airport. Service to existing airport customers is through copper lines, but recent upgrades installed fiber optic lines throughout the utilidor system. Trans-continental fiber service is expected to be in place by the end of 2014, with the development and installation of fiber optic service from Japan to London that will pass by Barrow. ASTAC has the opportunity to connect to this high-speed service. Rates vary depending on the extent of the customer's service requirements.

General Communications, Inc. (GCI)

GCI provides telephone, internet, and cable television services to the north side of the airport. Service is through a fiber optic system with coaxial service connections. Rates vary depending on the extent of the customer's service requirements.

Solid Waste Disposal

The NSB operates a Class II municipal solid waste landfill located 6 miles southwest of Barrow. The landfill is approved for ash, construction and demolition debris, inert waste, municipal refuse, non-asbestos-containing material, and sewage sludge. The NSB provides refuse collection services for household and commercial customers.

The NSB also operates a thermal oxidation system (TOS) incinerator facility for municipal waste. The Barrow TOS does not produce electricity, instead emitting directly to a stack exit. It was designed to process 30 tons per day of municipal solid waste and is currently permitted to process up to 20 tons per day of domestic and commercial refuse. The NSB incinerates most of its refuse in the TOS before depositing the ash in the 55-acre landfill.

2.4 Environmental Overview

The purpose of the environmental overview is to document environmental conditions that should be considered in the identification and analysis of airport development alternatives. These alternatives will be presented in Chapter 5. The information below outlines the existing conditions or potentially affected environment and helps to identify any data gaps. This information will help in developing purpose and need statements for subsequent documents that will be required to complete the environmental analysis required under the National Environmental Policy Act (NEPA).

2.4.1 Air Quality

According to FAA's *Airport Environmental Handbook*, no air quality analysis is needed if the annual levels of activity in a proposed study area are fewer than 1.3 million passengers and fewer than 180,000 operations, or if it is a general aviation airport with fewer than 180,000 annual operations forecast (Section 47(e)(5)(c)(l)). Current and forecast activity levels at BRW are well below 180,000 operations; therefore, no air quality analysis is necessary.

2.4.2 Coastal Resources

The Alaska Coastal Management Program (ACMP) website and agency are inactive. The federally approved ACMP expired on July 1, 2011, resulting in a withdrawal from participation in the Coastal Zone Management Act (CZMA)'s National Coastal Management Program. The CZMA federal consistency provision no longer applies in Alaska.

Although the Barrow airport is within a coastal district, it is not subject to the ACMP unless the program is re-activated and approved by state legislation. Because a federally approved coastal management program must be administered by a state agency, no other entity may develop or implement a federally approved coastal management program for the state.

For Barrow, the ACMP expiration means that FAA does not provide a consistency determination (with a state coastal management policy) for a NEPA document.

2.4.3 Department of Transportation Section 4(f)

Section 4(f) of the Department of Transportation Act of 1966, codified as 49 USC Section 303(c), gives the Secretary of Transportation approval power for projects requiring the use of publicly owned land of a park, recreational area; a wildlife refuge of national, state, or local significance; or a historic site of national, state, or local significance.

For historic sites, FAA may make this approval on behalf of the Secretary if it has made the determination under Section 106 of the National Historic Preservation Act (NHPA) that the project will not adversely affect historic properties and it has received concurrence from the State Historic Preservation Officer (SHPO) and the Tribal Historic Preservation Officer (THPO).

Although Section 4(f) applies to all historic sites of the national, state, or local significance, it only protects those properties on or eligible for inclusion on the National Register of Historic Places (NRHP).

The exception to this is that FAA can determine application of Section 4(f) is appropriate if an official formally provides information stating a site is locally significant.

There is therefore overlap between Section 106 and Section 4(f) requirements for historic properties. A notable difference is that Section 106 is a procedure involving consultation. Section 4(f) prevents project approval if the specific findings of de minimis impact cannot be made.

For historic sites, a *de minimis* impact (per 36 CFR Part 800) means that either historic property is not affected by the project or that the project will have "no adverse effect" on the historic property. A *de minimis* impact determination does not require analysis to determine if avoidance **alternatives** are feasible and prudent, but consideration of avoidance, minimization, mitigation or enhancement **measures** should occur.

There are no Section 4(f) lands defined for Barrow Airport. A search of the National Park Service's National Parks and National Forest and National Monuments found two listed properties on the National Register of Historic Places in the Barrow area. Neither of the listed properties—the Point Barrow Refuge Station (listed in 1980) and the Utkeagvik Church Manse (listed in 1983)—are within the proposed project area, and neither will be affected by airport improvements. A search of the Alaska Department of Natural Resources (ADNR) Division of Parks and Outdoor Recreation (DPOR) website (http://dnr.alaska.gov/parks/aspunits/index.htm) indicated there are no state parks in the proposed project area.

Northern Land Use Research Alaska, LLC (NLURA) prepared a report on cultural resources considerations for this project. NLURA's report is included in the Resource Documents binder (*Barrow Airport Master Plan Update Cultural Resources Data Gap Analysis* [March 2013]). Results indicate there are 18 Alaska Heritage Resource Survey (AHRS) sites within the airport boundary. Thirteen of these have not received determination of eligibility for listing on the NRHP, and further work is needed to determine their eligibility. The Barrow Airport terminal may also be eligible for listing on the NRHP. ADOT&PF is consulting with SHPO on these sites in anticipation of the Section 106 consultation required by NEPA.

In addition to the acknowledged sites of potential significance, unmarked graves are known to exist in the study area. These findings indicate that Section 4(f) requirements still apply, regardless of the absence of known Section 4(f) lands within the airport boundary. In order to fulfill the NEPA requirements of Section 4(f), DOT&PF will instigate a data request from the NSB Inupiat History, Language, and Culture (IHLC) Traditional Land Use Inventory (TLUI) database. The data request will allow known sites of local significance to be identified. In preparation for the NEPA environmental document, clearance will be obtained through the NSB IHLC/TLUI process. The preferred build alternative is expected to have a *de minimis* impact on any historic properties known to exist. The NSB IHLC TLUI clearance process is in addition to ongoing consultation with SHPO.

For any historic properties that are not included in the TLUI, NRHP, or AHRS and are not known to exist at this time, an Avoidance, Minimization, and Mitigation Plan will be implemented. The plan should include measures for inadvertent discovery and steps to avoid and minimize the archaeological risk of development within the study area. If an inadvertent discovery is made during earth-moving activities, work will be immediately suspended. In compliance with the Native American Graves Protection and Repatriation Act (25 USC 3001), if any human remains are inadvertently discovered during operations, activity will cease in the vicinity of the discovery and the tribal representative will be contacted in order to determine the appropriate course of action as specified in 43 CFR 10.4.

Although this high level of involvement is not typical at the pre-NEPA master plan stage, the intricate sensitivities involved in historic properties in and around the study area require early planning for Section 4(f) and Section 106 consultation.

2.4.4 Prime and Unique Farmlands

There are no prime farmlands in Alaska due to the soil temperature criteria, and no unique farmlands have been designated in Alaska.

2.4.5 Fish and Wildlife Resources

Barrow lies just south of the Arctic Ocean in an area characterized by numerous meandering streams and thousands of small lakes and swamps. The study area includes 38.21 acres of the Isatkoak Lagoon and 9.06 acres of shallow open water habitat (thermokarst ponds and former gravel extraction sites). These ponds are shallow enough to freeze to the bottom in winter and have not been identified as supporting fish.

ABR, Inc. Environmental Research & Services (ABR) prepared a report on fish and wildlife considerations for this project, which is included in the Resource Documents binder (*Fish and Wildlife Resources for the Barrow Airport Master Plan Update* [March 2013]*)*. The report summarizes wildlife habitat descriptions and species of concern that could occur around the Barrow Airport.

Anadromous Fish Streams and Essential Fish Habitat

A search of the Alaska Department of Fish and Game (ADF&G) online “Fish Distribution Database” identified that there are no catalogued anadromous water bodies within the proposed project area. A search of the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service’s (NMFS) website on March 14, 2013, revealed that there are no areas of Essential Fish Habitat (EFH) within the project area. There are also no Habitat Areas of Potential Concern at the proposed location.

Isatkoak Lagoon is a 160-acre waterbody directly to the east of the Barrow Airport runway. During airport construction, the lagoon was dredged and split into three sections. The upper and middle lagoon sections of the Isatkoak Lagoon are hydraulically connected but divided by a causeway. The lower lagoon is a designated wastewater lagoon. The upper and middle portions of Isatkoak Lagoon are known to support ninespine stickleback (pungitius pungitius).

Direct sampling of the upper and middle lagoon would confirm or negate the presence of other fish species and would categorize the likelihood of the system as a viable fish habitat. In 1980, ADF&G, following a request from the City of Barrow, conducted a feasibility study of the possibility of creating a recreational fishery in the lagoon. This study concluded that the lagoon system possessed the year-round physical habitat necessary to support a grayling fishery. In 1981, the ADFG and NSB Wildlife Management stocked the upper lagoon with 50,000 juvenile arctic grayling. However, sampling of the upper and middle lagoon two years later yielded zero fish caught over two days of gill net fishing.

Threatened and Endangered Species

No terrestrial mammals listed as threatened or endangered under the Federal Endangered Species Act (1973, as amended) are likely to occur in the study area (U.S. Fish Wildlife Service [USFWS] Listing Information).

Birds

For bird wildlife, there are two threatened species listed under the ESA, including both the Spectacled Eider (Somateria fischeri) and Steller's Eider (Polysticta stelleri). Extensive field surveys in 2004-2008 for pre-breeding eiders and eider nests yielded an absence of nests during that period. However, Barrow is an active habitat for a variety of migratory birds, and there are reports of both the Spectacled and Steller's Eiders in the vicinity of the airport. No known eider surveys have occurred since 2008.

Compliance with the Migratory Bird Treaty Act will ensure that no construction activities that will potentially damage active nests (such as vegetation clearing or gravel fill) will occur during the nesting season.

According to the 2000 Barrow Master Plan, the King Eider, Long-tailed Duck, Red Knot and Black Guillemot were also found to nest or breed near the airport. Other than the listed threatened species, none of the bird species known to use the proposed project area are of sufficient conservation concern to warrant field studies.

Marine Mammals

The Barrow Airport boundary does not include the marine environment. However, the close proximity of the airport to the near-shore environment warrants brief discussion of marine mammals in close vicinity to the airport.

NMFS has management responsibility for all marine mammals in Alaska except the sea otter, walrus, and polar bear. The population range of the sea otter does not extend to the North Slope (http://alaska.fws.gov/fisheries/mmm/seaotters/images/stockmap.gif). The Pacific walrus (Odobenus rosmarus divergens), a candidate species scheduled for a decision on listing in October 2017, has a summer and fall range extending to the Beaufort Sea (http://alaska.fws.gov/fisheries/mmm/walrus/pdf/walrus_range_map.pdf). Endangered marine species that inhabit waters in the vicinity of the project area also include the polar bear (http://alaska.fws.gov/fisheres/endangered/pdf/consultation_guide/4_Specieis_List.pdf). ABR's report, *Fish and Wildlife Resources for the Barrow Airport Master Plan Update, March 2013,* which is included in the Resources Document Binder, includes discussion on the polar bear.

ADOT&PF will consult with the USFWS and the NMFS during the NEPA process in accordance with Section 7 of the Endangered Species Act to determine the potential impact to threatened and endangered species or critical habitat areas. Early consultation well in advance of construction will also determine the need to conduct further nesting surveys.

State-Listed Species of Special Concern

Since August 15, 2011, ADF&G no longer maintains a list of Species of Special Concern. ADF&G does maintain the Wildlife Action Plan and uses this to assess the needs of species with conservation concerns. Aside from the threatened and endangered species, none of the species known to use the airport are currently of sufficient conservation concern to require field studies or other pre-construction evaluation (ABR, 2013).

Wildlife Hazards

Bird and wildlife attractants near or on airfields are incompatible with air operations. The FAA's online Wildlife Strike Database (http://wildlife.faa.gov/) provides strike data for the Barrow airport. Six strikes have been reported in the last five years. The species listed in the strike database include the glaucous gull (Larus hyperboreus), the Northern Pintail (Anas acuta), and the parasitic jaeger (Stercorarius parasiticus). A caribou strike was also reported in January 2005. Airport planning and improvements should consider the habitat types used by the species included in the strike record and identify means of mitigation to prevent future aircraft strikes.

Strike reporting is voluntary, and therefore the count may not be accurate. Statistics show that aircraft collisions with birds and other wildlife are a serious economic and public safety problem (AC 150/5200-33B). Birds and wildlife strikes cost U.S. civil aviation over $700 million/year, and more than 250 people have been killed worldwide as a result of bird strikes since 1988 (Bird Strike Committee, 2012). Not all birds and wildlife present equal hazards. The FAA has published a list of 25 species groups ranked by their relative hazard to aircraft (AC 150/5200-33B). Geese, a common species group in Barrow, ranked third.

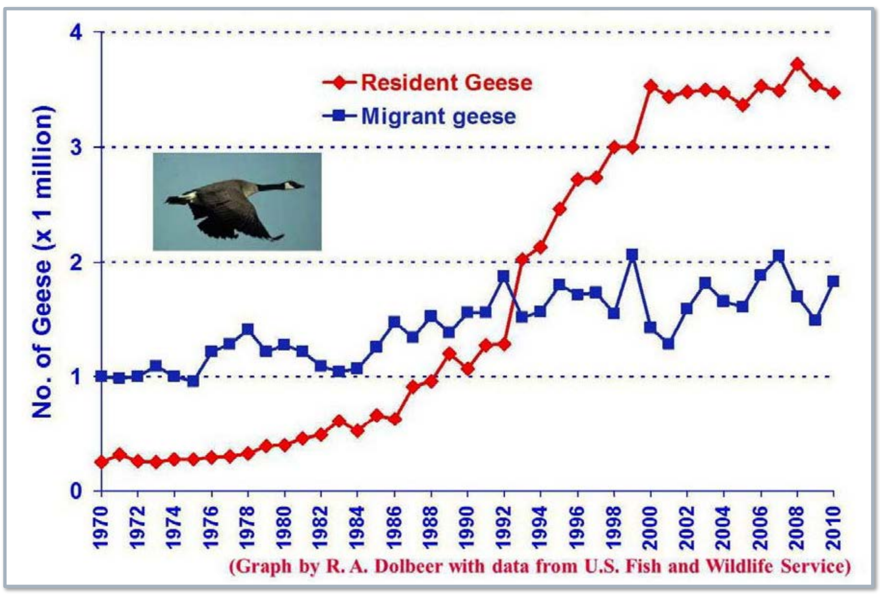


Figure 2-10 – Canada Goose Population in North America, 1970-2010

Source: Wildlife Strikes to Civil Aircraft in the Unites States 1990-2011 (FAA Report, 2012)

The abundance of wetlands and open water within the airport boundary and the proximity of the wastewater treatment facility (the lower section of the Isatkoak Lagoon) present a risk for aircraft. At airports servicing turbine-powered aircraft, FAA recommends a separation distance of 10,000 feet from hazardous wildlife attractants including wetlands and sewage lagoons. Isatkoak Lagoon is 81 feet from the Runway Safety Area at the east end of the runway.

On September 5-7, 2012, the FAA conducted a periodic inspection of the Barrow airport. During the inspection, the Lead Safety Inspector observed at least 40 Canada geese resting in ponding water along the runway safety areas and occasionally flying across the active runway. Other wildlife hazards (including a fox failing to respond to hazing) were identified during the inspection, and the inspector recommended that a wildlife hazard assessment (WHA) be completed.

Title 14 CFR, Part 139, of the CFR requires airport operators to conduct a WHA when certain events occur on or near the airport. FAA considers the results of the WHA and determines whether a formal Wildlife Hazard Management Plan (WHMP) is needed. If so, the airport operator must formulate and implement a WHMP, using the WHA as the basis for the plan. The intent of the WHMP is to minimize the risks to aviation safety, structures, and human health from hazardous wildlife. FAA's advisory circular explaining wildlife hazards and the steps to completing a WHA and WHMP (*Hazardous Wildlife Attractants on or near Airports*, AC 150/5200-33B [2007]) is on file with ADOT&PF.

2.4.6 Floodplains

Although most of Barrow is susceptible to flooding, the airport property is one of the few sections of town that does not flood. It is not likely that airport improvements would impact floodplain values.

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) online on March 18, 2013, revealed that the proposed project area is unmapped.

2.4.7 Hazardous Materials, Pollution Prevention, and Solid Waste

A May 2013 search of the ADEC Contaminated Sites database revealed that there are no existing sites in the "Open" status within the airport boundary. There are two former contaminated sites with a "Cleanup Complete" status within the airport boundary and one site with a "Cleanup Complete" status approximately 1 mile south of the airport (see Figure 2-11).

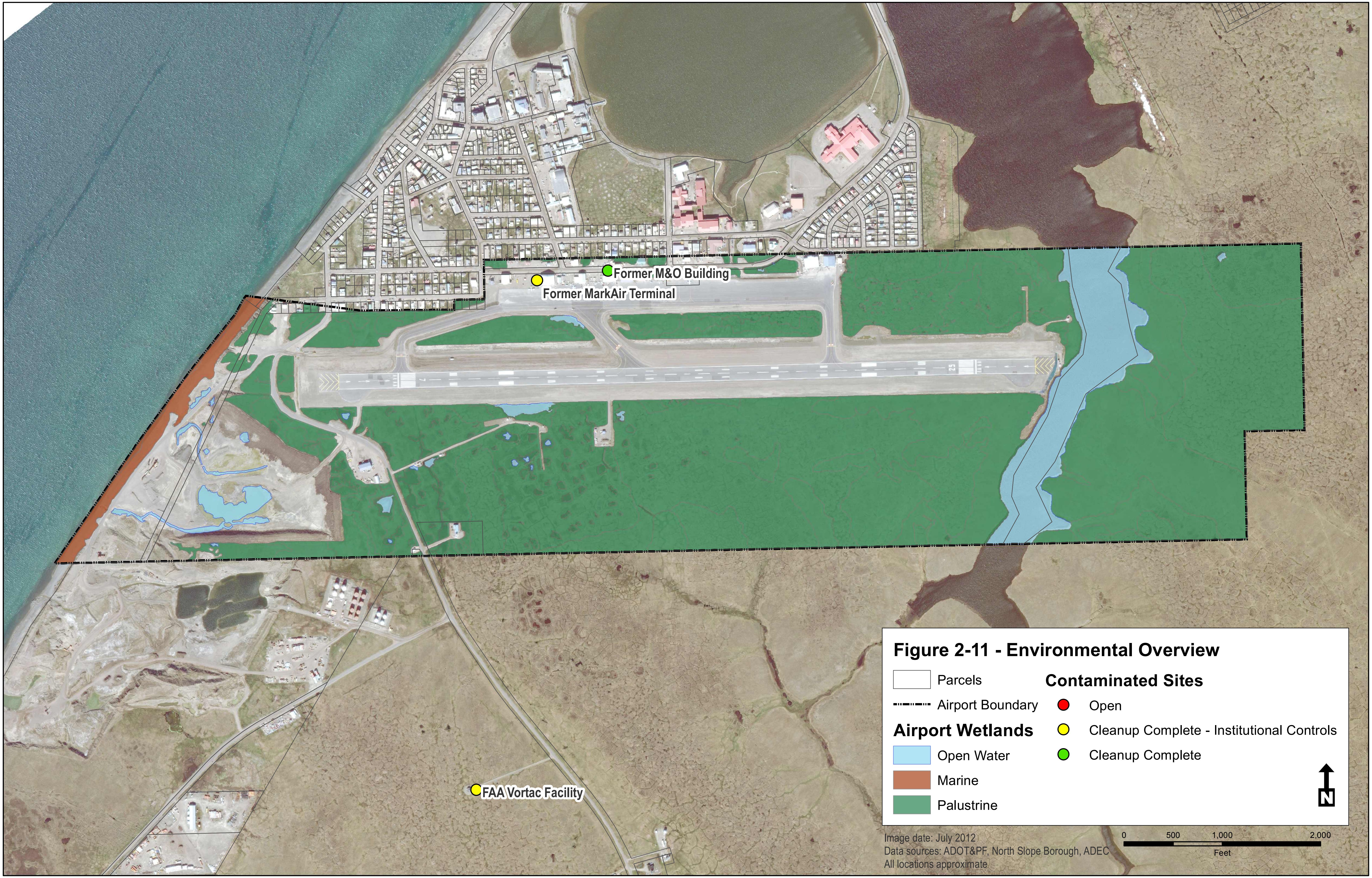
The three closed sites will be included in the planning process to ensure potential future construction does not encounter contamination. Sites include:

- Former ADOT&PF Maintenance and Operations Shop Building on Lease Lot 2A, Block 300
- FAA VORTAC Facility Pad (aka Maintenance Shop, Building 200; institutional controls in place)
- Former Mark Air Terminal (Lease Lot 4A, Block 100; institutional controls in place)

The closest contaminated site with an "Open" status is approximately 1 mile from the western end of the runway on the NSB South Pad. A 2011 inspection of the site found more than 350 drums of unknown material and 24 leaking aboveground storage tanks, with evidence of contaminant migration off the pad. As of November 2012, cleanup efforts were still in progress.

ADOT&PF will coordinate with ADEC throughout the design process to ensure any disturbance to contaminated areas is handled in an ADEC-approved manner. In December 2012, ADEC's Contaminated Sites Program contacted ADOT&PF Airport Leasing Program; a copy of the correspondence is included in the Resource Binder (*ADEC Decision Document, File No 310.38.010).* The letter summarizes the cleanup and the institutional controls of the Former Mark Air Terminal site.

- Any ground-disturbing activities or facility construction must be coordinated with and approved by the ADEC Contaminated Sites Program staff.
- For purposes of the Master Plan Update, any ground disturbing activities or facility construction on Lot 4a, Block 100, will require coordination with ADEC.



Former M&O Building
Former MarkAir Terminal
FAA Vortac Facility
Figure 2-11 - Environmental Overview
Parcels
Airport Boundary
Airport Wetlands
Open Water
Marine
Palustrine
Contaminated Sites
Open
Cleanup Complete - Institutional Controls
Cleanup Complete
N
Image date: July 2012
Data sources: ADOT&PF, North Slope Borough, ADEC
All locations approximate
0
500
1,000
2,000
Feet

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2.4.8 Historical, Architectural, Archeological, and Cultural Resources

Multiple sites within and near the project area are listed in the AHRS. Cultural resources are currently being reviewed as part of the environmental analysis for the Plan. Recent 2012 Office of History and Archaeology (OHA) site reports and all data of known cultural resources in the proposed project area are being assessed. ADOT&PF will evaluate the need for further cultural resources surveys including subsurface testing and a re-survey of human remains.

ADOT&PF and FAA will be consulting with the SHPO; THPOs; the NSB's Inupiat History, Language & Culture Division; Native tribes; and federal and state agencies in accordance with Section 106 of the National Historic Preservation Act (16 USC 470).

NLURA's *Barrow Airport Master Plan Updated Cultural Resources Data Gap Analysis* (March 2013), which is included in the Resource Documents binder, includes more detail on AHRS sites within and near the project area.

2.4.9 Light Emissions and Visual Impacts

While the Barrow airport has remained in its current location since its construction, residences and businesses have encroached on the airport property. No major changes are proposed for the airfield lighting that would increase the visual impacts to the surrounding properties.

2.4.10 Noise

A detailed noise analysis was performed as part of the 1983 Barrow Airport Development and Land Use Plan. The report noted that the 60 L_{DN} (day-night average sound level) contour extended into the Barrow townsite.

Since 1983, conditions have changed including quieter jets and increased helicopter use. Noise has been brought up as a potential issue by the community. In 2012, ADOT&PF commissioned a four-month Noise Monitoring Study. The results of this study were used to help determine if conditions warrant further noise analysis. Further noise analysis will serve two purposes:

- Augment the data analysis section of the draft Noise Monitoring Report using ADOT&PF-collected information and scheduled flight operations data. This will provide a better understanding of the noise environment and serve as a tool for the Master Plan team to discuss airport-related noise with the community.
- Use the Integrated Noise Model (INM) to generate noise contours and noise exposure maps. These maps would serve as a tool to assist ADOT&PF, FAA, and the public in understanding the impacts of existing and various future growth scenarios and support alternative selections in the master planning process.

2.4.11 Socioeconomic Impacts

Socioeconomic conditions in Barrow are described in Chapter 3.

2.4.12 Receiving Waters/Impaired Water Bodies/Water Quality

ADEC's website (http://www.dec.state.alaska.gov/water/wqsar/waterbody/2010ImpairedWaters.pdf), accessed on March 14, 2013, revealed no impaired waterbodies in the project area. Wetlands adjacent to the airport property and surrounding area are influenced by surface runoff from the airport runway and aprons.

Barrow's community water source is Isatkoak Lagoon, located 0.25 miles from the airport terminal. Part of Isatkoak is within the airport property boundary (see Figure 2-1). Water is treated by filtration.

Barrow Airport operates under an Alaska Pollution Discharge Elimination System (APDES) Multi-Sector General Permit for Storm Water Pollution Prevention. During construction and normal operations, erosion and sediment control measures under an approved Storm Water Pollution Prevention Plan (SWPPP) will control potential pollutants and protect the adjacent wetlands.

2.4.13 Wetlands and Vegetation

ABR, Inc. prepared a report for this topic. See *Fish and Wildlife Resources for the Barrow Airport Master Plan Update* (March 2013) included in the Resource Documents binder. The report summarizes the land types included in the airport boundary; 504.57 acres are comprised of either wetlands or open water.

Previous studies at the airport also document large extents of wetlands in the project area. ADOT&PF commissioned a wetland study for the project area in the summer of 2012, and a third party review of that work was completed in early 2013. This Master Plan Update will assess and analyze potential wetlands impacts of development alternatives. Any future development options involving embankment construction will undoubtedly require a United States Army Corps of Engineers (USACE) Section 404 permit. Close coordination will be needed with USACE, USFWS, and other agencies to minimize impacts and to identify any required mitigation necessary.

2.4.14 Wild and Scenic Rivers

A search of the National Wild and Scenic Rivers System website (www.rivers.gov/rivers/maps/alaska.php) on March 14, 2013, revealed that no Wild and Scenic Rivers exist in the proposed project area.

2.4.15 State Refuges, National Wildlife Refuges, Critical Habitat Areas, and Sanctuaries

On March 14, 2013, a search of the Alaska Fish and Game Department of Wildlife Conservation website (http://www.wildlife.alaska.gov/index.cfm?adfg=refuge.main) found no state refuges, critical habitat areas, or sanctuaries in the project vicinity.

A February 2013 ruling by the U.S. Fish and Wildlife Secretary excluded the town of Barrow, including the airport property, from designation as a polar bear critical habitat.

2.5 Climate

Barrow's climate is cold and dry, with less than 30 inches of snow annually and an annual average temperature below freezing (10.4°F). The temperatures are moderated somewhat by the Arctic Ocean. At the peak in July, daytime highs average 45°F. Average lows in February are the coldest of the year, approximately -22°F (Figure 2-12).

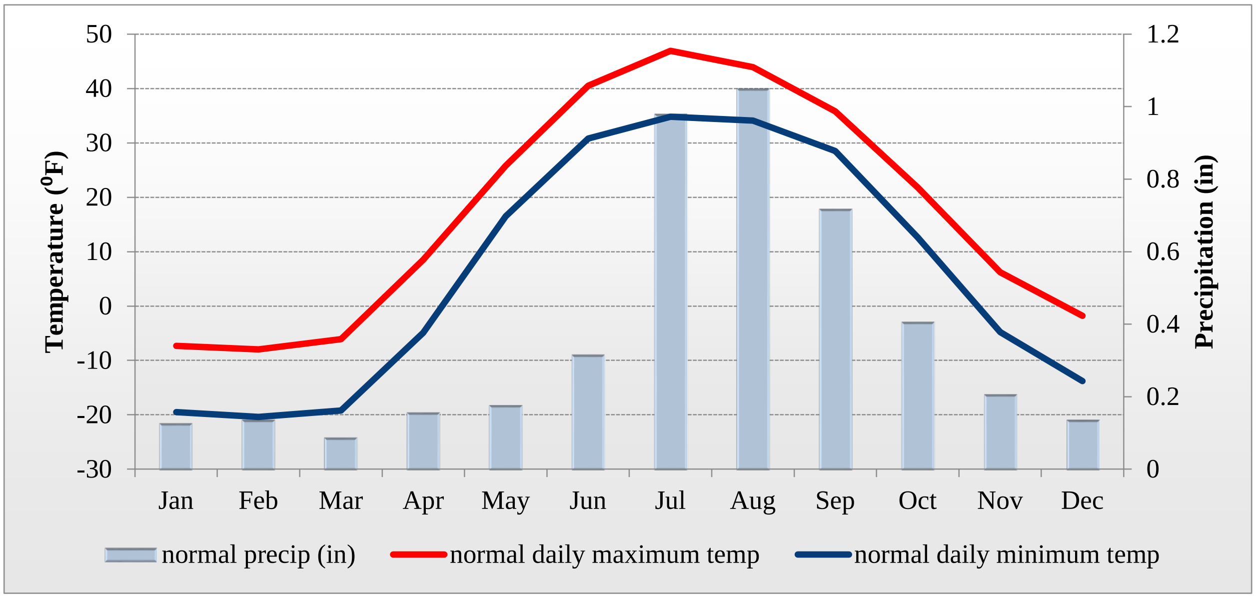

Figure 2-12 – Barrow Average Temperatures and Precipitation
Data Source: NOAA National Climatic Data Center

The surrounding topography is flat tundra and ocean, and winds are common throughout the year. According to the Alaska Climate Research Center, calm conditions only occur 1% of the time in Barrow. Wind speed is consistent throughout the year, averaging approximately 11 mph; the predominant wind direction is east-northeast. Fog is also common in the summer and fall when the ocean is ice-free, with June, July, and August averaging eight or more foggy days each (Table 2-13).

Table 2-13 – Mean Number of Days per Month with Fog Reducing Visibility to ¼-Mile or Less
Data Source: NOAA National Climatic Data Center

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.4	1.2	1.2	2.4	6.9	**8.4**	**11**	**10.9**	5.1	2.7	1.7	0.9

The Chukchi and Beaufort Seas are ice-covered for half of the year, with landfast ice present at Barrow from November through June. Ice cover helps protect the beach from storm-caused erosion and reduces the chance of fog.

On November 18th the sun drops below the horizon and does not rise again until January 24th. By May 10th, the sun is up for 24 hours per day and does not set again until August 2nd.

2.6 Airport Geotechnical Conditions

2.6.1 General Geology

The Barrow Airport is located on the north coast of Alaska in the Arctic Coastal Plain, which is a broad, roughly triangular area bordered by the arctic foothills on the south and the Arctic Ocean on the north and extending from Cape Beaufort in the west to the Canadian border in the east. It is approximately 400 miles long, with a maximum width of eight miles and an area of approximately 25,000 square miles. It is characterized by low topographic relief and tundra laced with thousands of small lakes and swamps with numerous meandering streams.

For the most part, permafrost underlies the area, with a layer of ice-rich silt lying beneath the organic-rich peat and tundra at the surface. The plain is underlain by Cretaceous strata capped by a thin mantle of dominantly marine Quaternary sediments, called the Gubik formation. This stratum continues beneath the ocean and forms the shallow continental shelf, which terminates offshore at the rim of the deeper basin of the Arctic Ocean.

2.6.2 Soil Profile

The Arctic Coastal Plain has been extensively modified by surf action as sea levels fluctuate. Permafrost, which is present throughout the area, impedes drainage and soil development, resulting in shallow, wet soils overlying frozen ground.

Both the surficial silt and underlying beach deposits have been modified by frost action and ice-lens formation so that vegetation is present within the deposits in all states of oxidation. In addition to frost churning, the on-going process of lake formation and filling-in, with associated sedimentation, further modifies the sediments.

Surface organics on the North Slope consist of tundra vegetation growing on a layer of peat. This peat has formed from dead organic matter which has decomposed in the reducing environment present below ponded surface water. Permafrost impedes drainage, so that these saturated conditions are typically present throughout the area during the brief summer seasons. In undisturbed areas, the permafrost is 1 to 8 feet deep with the strata above thawing during the summer for a seasonal frost or active layer of 1 to 8 feet.

2.6.3 Surface and Ground Water Flow

With the permafrost and the active layer only being thawed for a short period each year, there is minimal ground water flow.

The airport is virtually surrounded by surface water. The Arctic Ocean is approximately 1,400 feet west of the runway. Isatkoak Lagoon is immediately east of the runway and bends around to a point approximately 2,000 feet north of the runway. Numerous small lakes dot the tundra south of the runway.

2.6.4 Borrow Material

The Barrow Airport material site is located about 2,000 feet south-southwest of the west end of the runway (Figure 2-4). The site is along the coast of the Chukchi Sea and is accessed by a road along the beach and coastal bluff.

The soils are classified as gravel, sandy gravel, and gravelly sand. They are suitable for use as embankment borrow. This material has a degradation value of 95 and an L.A. Abrasion Test loss of 18%, indicating that it is also suitable for use as asphalt aggregate.

Material in and around Barrow that is suitable for airport construction is limited. The borrow pit on the airport property is nearing the end of its useful life. Expansion at this site is limited on the south by a petroleum pipeline and on the east by Emaiksoun Road. In May 2013, ADOT&PF drilled several boreholes south and southeast of the airport to determine the extent of the existing material source and to locate possible new sources. Analysis of the cores indicated that there is additional material available if the existing borrow pit is expanded to the east. However, this area contains Emaiksoun Road, several buildings, and airport navaids. The potential material source to the southeast of the airport contains approximately 1 million cubic yards of sand and gravel; however it is not on State land and does not have an access road.

2.7 Maintenance & Operations (M&O)

ADOT&PF personnel are responsible for the maintenance and operation of the airfield, including snow removal, runway de-icing and sanding, friction testing, wildlife management, security badging, and emergency response. M&O personnel mentioned several concerns during the inventory process:

- Not enough storage space for equipment and supplies in the M&O building
- Snow drifting off the western end of the runway due to the security fence
- Erosion of the RSA

M&O personnel work in Barrow on a one-week-on/one-week-off rotation. They operate in shifts, with two people per shift and a 3-hour overlap between shifts. Shifts run between 6:00 a.m. and 8:30 p.m.

M&O has a combined-use facility at BRW that includes office space, a bunkhouse, Aircraft Rescue and Fire Fighting (ARFF) equipment, vehicle storage, and limited sand and chemical storage. M&O staff report that the building is too small to accommodate all of their equipment, vehicles, and de-icing materials. Table 2-14 lists the current M&O vehicle fleet at BRW.

Snow removed from the apron is pushed into the unpaved areas between Taxiways A, B, and C. ADOT&PF removes snow up to 50 feet from leaseholder buildings. Leaseholders are responsible for removing the snow within 50 feet of their buildings. Snow on the runway is swept or blown beyond the safety areas into the surrounding tundra. No snow is trucked off-airport. M&O personnel report snow drifting off the west end of Runway 7 because of the security fence.

Table 2-14 – M&O Equipment Fleet

Vehicle Type	Quantity
Pickup Truck	4
Loader	2
Grader	1
Snow Blower	2
Broom	1
Plow Truck	1
SUV	1
Dump Truck	1
E1 Fire Truck	1

M&O staff conduct friction testing every morning and relay the results to the FSS. At present, urea is used for de-icing, but as a result of changing EPA policies, it is being phased out and replaced with a liquid de-icing agent that meets the new regulations. Traction sand is screened and bagged in the autumn before freeze-up and stored in a corner of the M&O facility.

Aircraft operators are responsible for de-icing their aircraft. There is no centralized de-icing facility or equipment, so aircraft de-ice on the aprons in front of their respective lease lots. Contaminated snow is not handled any differently from non-contaminated snow.

ADOT&PF maintains a storm water management plan for BRW. M&O personnel report that the runway safety area has experienced considerable erosion from late-summer rains. Block 700, which is undeveloped, has also experienced substantial erosion, even after installation of an anchored geotextile material.

Maintenance and operations costs have grown over the past four years (see Figure 2-13), with total costs exceeding $1.7 million for state fiscal year 2012. The most dramatic cost increase has been in the price of commodities (although the steep increase in FY2012 is primarily attributable to a one-time $550,000 expenditure for the new security fence).

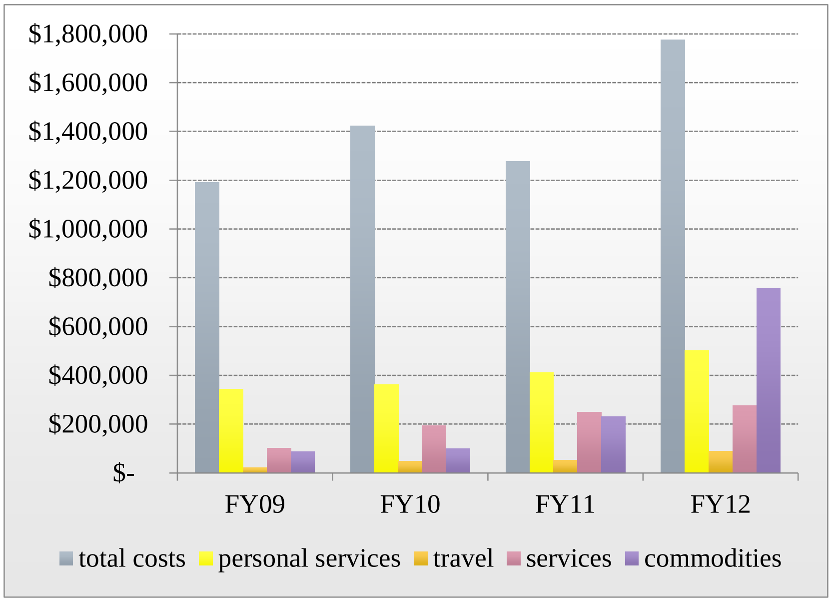

Figure 2-13 – Maintenance & Operations Costs for BRW, FY2009-2012

Source: ADOT&PF

2.7.1 Aircraft Rescue and Fire Fighting

Barrow Airport is a Part 139 Certified Airport and as such is required to have firefighting agents such as water, foam, Halotron, etc., available at specified volumes, rates, and response times. ADOT&PF operate the aircraft rescue and firefighting (ARFF) facilities in Barrow. The Barrow ARFF presently holds an Index B rating.

The ARFF vehicle (Figure 2-14) carries 3,000 gallons of water, 700 pounds of dry extinguishing agent, and 500 gallons of foam.

Figure 2-14 – ARFF Vehicle

2.8 Financial Data

2.8.1 Historic Airport Improvements Program (AIP) Funding

FAA's Airport Improvements Program provides grants to public agencies for planning and development of public-use airports. The existing infrastructure and major rehabilitation efforts at BRW have been completed primarily using federal AIP funds with matching funds from the State of Alaska. AIP funding comes from the Aviation Trust Fund, an accumulation of aviation taxes on aviation users throughout the country.

In general, AIP funds can be used on most airfield capital improvements or repairs except those for terminals, hangars, and non-aviation development. For Primary Airports such as BRW, there are two types of funding with the AIP:

- Entitlement funds, based on levels of passenger traffic and levels of cargo aircraft landed weight, subject to certain minimum and maximum levels
- Discretionary funds, distributed based on the ranking of the airport's projects in relation to others deemed most important for improving the national airspace system. Discretionary funds are generally used for safety area, pavement, and security improvements.

Barrow competes for AIP funds with other regional airports such as Kotzebue, Bethel, and Nome. ADOT&PF regions prepare detailed project nomination sheets and cost estimates for regional aviation projects. Collectively, the ADOT&PF regions score all of the proposed projects based on aviation criteria and guidance. Criteria include safety; health and quality of life; economic development; maintenance and operations issues; local capital contribution to project cost; and others.

Since 1984, more than $55 million in AIP funding has been spent on improvements to the Barrow airport.

Table 2-15 – Historic AIP Funding for BRW

Project	Year	Funding[2]
Rehabilitate Apron	1984	$ 521,185
Expand Apron	1986	1,610,736
Rehabilitate Taxiway	1986	1,385,513
Install Apron Lighting	1986	138,302
Acquire ARFF Vehicle	1988	295,783
Construct Apron	1990	123,094
Install Runway Lighting	1990	886,319
Improve RSA	1990	952,801
Install Apron Lighting	1990	631,954
Improve ARFF Building	1992	2,200,515
Airport Master Plan Study	1998	247,259
Improve SREB	1998	1,688,688
Expand Apron	2001	3,024,161
Rehabilitate Apron	2002	1,500,000
Rehabilitate Runway	2002	5,650,861
Extend RSA	2002	16,848,803
Construct RSA	2003	3,049,999
Rehabilitate Runway	2003	2,750,000
Acquire ARFF Vehicle	2005	800,000
Snow Removal Equipment	2005	107,350
Acquire Snow Removal Equipment	2006	262,064
Rehabilitate Runway	2008	500,000
Construct RSA	2008	2,500,000
Safety Equipment/Fencing	2009	133,425
Construct RSA	2010	7,200,000
Airport Master Plan Study	2012	562,500
Snow Removal Equipment	2012	334,825
Total		**$55,906,137**

[2] No adjustments for inflation

2.8.2 Leasing Revenues

ADOT&PF collects fees for property leasing at State-owned airports. Fees collected under this program are deposited into a designated account that helps fund ADOT&PF's Statewide Aviation and Aviation M&O Sections. Leasing revenue for the past three years is shown in Table 2-16.

Table 2-16 - Leasing Revenues, BRW

Year (state fiscal year)	Leasing Revenue
2010	$137,788
2011	$143,214
2012	$145,358

2.9 Related Plans, Programs, and Projects

The following is a list of local area and regional land use and transportation plans to be considered when determining direct or indirect impacts of airport development at Barrow. When available, links to each plan are included.

2.9.1 2000 Barrow Airport Master Plan

The previous master plan update was completed in 2000. Recommendations from that plan included moving the runway centerline south by 125 feet and expanding the apron area. Many of the recommendations in the plan have been enacted.

2.9.2 2004 Northwest Alaska Transportation Plan

http://dot.alaska.gov/stwdplng/areaplans/area_regional/nw.shtml

The Northwest Alaska Transportation Plan provided a long-term strategic plan to improve year-round mobility and access for residents in northwest Alaska and to broaden and diversify the region's transportation network. The plan explored potential road, aviation, and marine transportation options and developed recommendations that would improve the movement of goods, improve connectivity between communities, and remove barriers to regional economic development.

2.9.3 2005 North Slope Borough Comprehensive Transportation Plan

http://www.north-slope.org/information/comp_plan/comp_plan.php

The 2005 NSB Comprehensive Transportation Plan is an element of the NSB Comprehensive Plan that outlines transportation-related issues, goals, and objectives. The plan recommended the following improvements at the airport:

- Passenger terminal with security screening, baggage claim, and vehicle access
- Cold storage building for sand and de-icing chemicals

The plan recognizes the traditional subsistence lifestyle of Borough residents and recommends that transportation facility planning avoid conflicts with this lifestyle. The plan's first subsistence conflict avoidance objective is, "Ensure the siting, design, construction, and maintenance of transportation facilities does not adversely impact subsistence resources."

2.9.4 2011 Alaska Aviation System Plan (AASP)

http://www.alaskaasp.com/

The AASP sets the vision for the Alaska aviation network by addressing Alaska's aviation infrastructure and policy needs. It is a key component of ADOT&PF's statewide transportation plan.

The AASP made projections of aircraft activity for all airports in the state, including BRW. These forecasts are outlined in Chapter 3, Aviation Demand Forecasts.

2.9.5 2011 Native Village of Barrow Comprehensive Economic Development Strategy

http://nvb-nsn.gov/doc/NVB_CEDS_2011_For_Public_Comment.pdf

The goal of this long-term plan is to move the tribal government and its membership into self-sustaining economic development. While it does not address the Barrow airport directly, it does recommend developing the tourism sector, which would directly rely on air access to the community.

2.9.6 2012 National Petroleum Reserve – Alaska (NPR-A) Integrated Activity Plan

https://www.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=14702

The NPR-A Integrated Activity Plan (IAP) addresses a list of issues and contains five alternatives for the BLM's future administration of nearly 23 million acres of public lands on Alaska's North Slope. NPR-A borders Barrow, and development in the reserve may have impacts on the community.

Alternative A, the no action alternative, would continue the management established in the current Records of Decision (RODs) for the Northwest NPR-A IAP, Northeast NPR-A Supplemental IAP, and decisions made as part of the Colville River Special Area Management Plan. There are no current BLM IAP decisions effective for the southern portion of the NPR-A. Under this Alternative, 57 percent of the NPR-A subsurface would be available for oil and gas leasing, while maintaining the four current Special Areas covering 8.3 million acres.

Alternatives B-1 (formerly Alternative B in the Draft IAP/EIS), B-2, C, and D would make between 48 and 100 percent of the total subsurface of the NPR-A, including unleased and currently leased lands, available for oil and gas leasing. These alternatives would make roughly two-thirds to all of the economically recoverable oil production possible, and nearly half to all of the economically recoverable gas production possible from BLM's subsurface estate in the NPR-A. The alternatives would also add zero to 7.2 million acres in designated Special Areas, and recommend zero to 12 rivers within the NPR-A for inclusion in the Wild and Scenic Rivers System.

2.9.7 2012 Outer Continental Shelf Oil and Gas Lease Program: 2012-2017

http://www.boem.gov/Oil-and-Gas-Energy-Program/Leasing/Five-Year-Program/2012-2017/Five-Year-Program.aspx

The 2012 Outer Continental Shelf (OCS) Oil and Gas Lease Program outlines the schedule of offshore lease sales over the next 5 years and the associated impacts of potential development. There are two defined planning areas in Alaska: the Chukchi and Beaufort Seas. This program authorizes offshore lease sales in the Chukchi Sea in 2016 and the Beaufort Sea in 2017.

OCS development in Alaska has a direct impact on the transportation infrastructure at Barrow. Oil and gas companies may utilize Barrow as a staging area for access to offshore leases in the Chukchi and Beaufort Seas.

3 Forecast of Aviation Activity

Forecasts of future levels of aviation activity are the basis for making decisions in airport planning. A comprehensive forecast includes elements of socioeconomics, demographics, geography, and external factors. Barrow's location puts the community at the forefront of regional oil exploration and subsequently plays a large role in the aviation activity at Barrow Airport. In this aviation forecast, the impacts of increased oil exploration are discussed and presented as the high growth scenario in Section 3.4.2.

Reported base passenger enplanements at Barrow Airport for the year 2012 are 43,673. With a median 1.7% annual increase, enplanements could reach 61,183 by 2032.

Forecast operations for this Master Plan were developed using the same methodology as was used for the enplanement forecast; see Section 3.4.2. Operations at Barrow Airport are not formally recorded because there is no air traffic control tower. Consequently, operations estimates from a variety of sources were compiled to generate the base year estimate. The 2012 base year estimate of operations is 12,865, with 18,023 possible by 2032 using a mid-range growth rate of 1.7%.

The methodology used for the Barrow Airport air traffic forecast is based on the process recommended in FAA AC 150/5070-6B, *Airport Master Plans*, and in *Forecasting Aviation Activity by Airport* (FAA, 2001). These documents provide national guidance for the development of airport master plans and have been used since enactment of the Airport and Airways Development Act of 1970. Recommended steps include:

- **Step 1:** Identify aviation activity measures
- **Step 2:** Review previous airport forecasts
- **Step 3:** Gather data
- **Step 4:** Select forecast methods
- **Step 5:** Apply forecast methods and evaluate results
- **Step 6:** Compare forecast results with FAA's Terminal Area Forecasts
- **Step 7:** Obtain approval of the forecasts

This forecast is laid out according to these steps.

3.1 Step 1 – Identify Aviation Activity Parameters and Measures to Forecast

The level and type of aviation activity anticipated at an airport, as well as the nature of the planning to be done, determine the factors to be forecast. Generally, the most important activities for airfield planning are aircraft operations and the fleet mix, since these define the runway and taxiway requirements. Plans for general aviation airports require forecasts of aircraft operations and based aircraft to define runway, taxiway, and aircraft parking requirements. Airports with commercial service require forecasts of aircraft operations, fleet mix, and passenger enplanements. Enplanement numbers are particularly important, since they determine the size of important elements of airport infrastructure such as parking facilities and access roads. Also, a large increase in passengers could trigger a change in future aircraft fleet mix through increased operations or larger aircraft. Barrow Airport is primarily a commercial services airport with some general aviation activity.

Practical considerations dictate the level of detail and effort that should go into an airport planning forecast (FAA, 2001). Air traffic activity at Barrow comprises commercial passenger and passenger-cargo-combination jets and turboprop aircraft, commercial cargo aircraft, single and twin-engine GA aircraft, corporate jets, and helicopters. Commercial operations, passenger enplanements, mail, and cargo have historically made up a significant percentage of the annual aviation activity. Other activities include military operations, regional search and rescue, touch-and-go operations, and other general aviation activities. The forecast for Barrow Airport will focus on:

- Passenger Enplanements: Air carrier, commuter/air taxi
- Aircraft Operations: Air carrier, commuter, general aviation, military
- Based aircraft: Single- and multi-engine, helicopter
- Air Cargo: Freight and mail

3.2 Step 2 – Collect and Review Previous Airport Forecasts

Relevant forecasts for Barrow and the surrounding area are summarized below. These include the FAA Terminal Area Forecast (TAF), the Alaska Aviation System Plan (AASP), the 2000 Barrow Airport Master Plan, the National Plan of Integrated Airport Systems (NPIAS), and the 2004 Northwest Alaska Transportation Plan.

3.2.1 Federal Aviation Administration Terminal Area Forecast

The FAA TAF projects the activity for airports across the nation. In Alaska, however, the TAF is not updated often and the data provided are not always accurate for non-towered airports. Nevertheless, the FAA guidance requires comparison of the Airport Master Plan (AMP) forecast with that of the TAF as part of the forecast approval process. The FAA TAF for Barrow Airport is summarized in Table 3-1. The TAF includes passenger enplanements, aircraft operations, and based aircraft for major uses of the airport (air carriers, air taxi and commuters, general aviation, and military).

Table 3-2 highlights the difference between historic TAF and actual passenger enplanements. Comparison of the TAF with the AMP forecast is presented in Section 3.7.

Table 3-1 – FAA Terminal Area Forecast (2012) Barrow Airport

Passenger Enplanements			Itinerant Aircraft Operations				Local GA	Total
Air Carrier	Commuter	Total	Air Carrier	Commuter/Air Taxi	GA	Military	Operations	Operations
28,668	11,763	**42,077**	1,460	6,000	1,500	50	3,000	**12,010**

Table 3-2 – Passenger Enplanements (2004-2012), Barrow Airport

Source: FAA and US DOT, RITA

Year	TAF	ACAIS[1]	Difference (ACAIS – TAF)
2003	36,138	35,492	**(371)**
2004	35,240	35,178	**(62)**
2005	36,024	36,708	**684**
2006	38,013	38,888	**998**
2007	38,778	39,009	**231**
2008	40,197	40,503	**305**
2009	38,834	39,494	**660**
2010	40,907	40,141	**(767)**
2011	40,431	41,174	**421**
2012	42,077	43,673	**1,596**

3.2.2 Alaska Aviation System Plan

The AASP is a component of ADOT&PF's Statewide Transportation Plan. Most recently updated in 2008, the AASP contains forecasts of enplanements, cargo, operations, and based aircraft for 2015, 2020, and 2030. These forecasts are presented in Table 3-3.

Table 3-3 – Alaska Aviation System Plan Forecast, Barrow Airport

Barrow	2008 (base)	2015	2020	2030
Enplanements	**40,673**	**50,005**	**58,840**	**71,813**
Cargo Tonnage	**11,121**	**11,567**	**13,178**	**17,167**
Critical Aircraft	**737-200**	**737-200**	**737-200**	**737-200**
Aircraft Operations				
Commercial Operations	9,116	9,823	11,120	12,508
Based Aircraft – Single Engine	9	10	10	11
Based Aircraft – Multi-Engine	6	7	7	7
Based Aircraft – Jet	1	1	2	3
Based Helicopter	3	4	5	7
Military Operations	50	50	50	50
Total Aircraft Operations	**16,666**	**17,563**	**19,309**	**22,541**

[1] Air Carrier Activity Information System; see discussion in Section 3.3.1 for details

3.2.3 Barrow Airport Master Plan Update (2000)

In 2000, ADOT&PF updated the Barrow Airport Master Plan. This update forecasted aircraft operations and passenger enplanement forecasts as summarized below.

Table 3-4 – 2000 Barrow Airport Master Plan Update Aviation Forecast

	1998 (base)	2005	2010	2020
Enplanements	39,467	45,335	50,054	61,015
Cargo (tons)	12,000	14,362	16,329	21,107
Commercial Operations	12,050	12,376	12,634	13,226
GA Operations	3,900	4,238	4,514	5,173
Military Operations	50	50	50	50

3.2.4 National Plan of Integrated Airport Systems (NPIAS)

The NPIAS presents a five-year forecast of enplaned passengers and based aircraft. The current NPIAS forecast for Barrow (for the years 2013 to 2017, using 2011 as the base year) is presented in Table 3-5.

Table 3-5 – NPIAS Forecast Year 2013

Parameter	Qty.
Passenger Enplanements	40,141
Based Aircraft	8

3.2.5 Northwest Alaska Transportation Plan (2004)

The Northwest Alaska Transportation Plan was a multi-year effort to define and select a blueprint for the region's long-term transportation future. The plan is one of several regional, multi-modal transportation plans that are part of the Statewide Transportation Plan.

Table 3-6 – 2004 Northwest Alaska Transportation Plan Enplanement Forecast for Barrow[2]

Year	2005	2010	2015	2020	2025
Enplanements	41,305	44,544	47,680	50,998	54,301

3.3 Step 3 – Gather Data

FAA requires master plan forecasts to incorporate the number of aircraft operations for various categories of aircraft. Passenger enplanement, cargo, mail, and freight data are also required, and the governing AC specifies that population, employment rates, and socio-economic factors be included, as any of these can also affect the forecast.

[2] Base year 2000

Air traffic operations at Barrow Airport are not recorded on site because there is no air traffic control tower. Historical air traffic data for Barrow were collected from:

- FAA's Airport Master Record Form 5010
- FAA TAF
- U.S. Department of Transportation (USDOT) Bureau of Transportation Statistics
- NPIAS
- Northwest Alaska Transportation Plan
- AASP

Data also came from interviews with airport tenants, ADOT&PF maintenance personnel, oil companies, the US Coast Guard, and the Barrow FSS, as well as public meetings and user questionnaires provided data on operations, enplanements, and freight.

3.3.1 Historic Aviation Activity

The composition of aviation activity at BRW has changed considerably since the 2000 airport master plan. This is due to several factors, notably:

- Changes in the bypass mail program requiring USPS contract mail carriers to also carry passengers (2002)
- A series of mergers that consolidated Cape Smythe Air, Frontier Flying Service, Hageland Aviation, Era Aviation, and Arctic Circle Air into a single company, Era Alaska (2005-2010)[3]

These changes have significantly reduced both the number of air carriers and air taxis serving Barrow and the number of based aircraft. However, the number of operations and enplanements has steadily climbed. Likewise, renewed interest in regional oil exploration has brought additional charter and support aircraft to Barrow. The U.S. Coast Guard is also increasing its presence in the Arctic with additional operations utilizing Barrow Airport.

Historic passenger and cargo data are maintained by the FAA in the Air Carrier Activity Information System (ACAIS), a database that contains revenue passenger boarding and all-cargo data. USDOT is the main source of enplanement statistics for this database, collecting information from air carriers and commuters on Form 41 Schedule T-100. The USDOT Bureau of Transportation Statistics Research and Innovative Technology Administration (RITA) distributes these data through an online, query-able database.

[3] Note that even though these companies have merged, they still operate aircraft under the Hageland, Era, and Frontier names and report data on the Form 41 Schedule T-100 as individual carriers

Aircraft Operations

Table 3-7 contains aircraft operations forecast data for Barrow Airport from 2000 to 2012 as reported in the TAF.

Table 3-7 – TAF Historic Aircraft Operations (2000-2012), Barrow Airport

Year	Itinerant Operations				Local Operations		Total Operations
	Air Carrier	Air Taxi	GA	Military	GA	Military	
2000	3,200	4,000	1,500	50	3,000	0	**11,750**
2001	3,200	4,000	1,500	50	3,000	0	**11,750**
2002	3,200	4,000	1,500	50	3,000	0	**11,750**
2003	3,200	4,000	1,500	50	3,000	0	**11,750**
2004	3,200	4,000	1,500	50	3,000	0	**11,750**
2005	1,200	6,000	1,500	50	3,000	0	**11,750**
2006	1,200	6,000	1,500	50	3,000	0	**11,750**
2007	1,200	6,000	1,500	50	3,000	0	**11,750**
2008	1,200	6,000	1,500	50	3,000	0	**11,750**
2009	1,460	6,000	1,500	50	3,000	0	**12,010**
2010	1,460	6,000	1,500	50	3,000	0	**12,010**
2011	1,460	6,000	1,500	50	3,000	0	**12,010**
2012	1,460	6,000	1,500	50	3,000	0	**12,010**

In the absence of control tower records, the numbers of Airport Advisories issued by the Barrow FSS for the past six years were collected (Figure 3-1). Airport Advisories are generally requested by pilots before take-off and landing and thus can serve as an estimate of airport operations. Airport Advisories are not a complete count of operations, however, as pilots are not obligated to request one and they are only issued during FSS open hours. In Barrow, the FSS is open from 6:00 a.m. until 10:00 p.m.

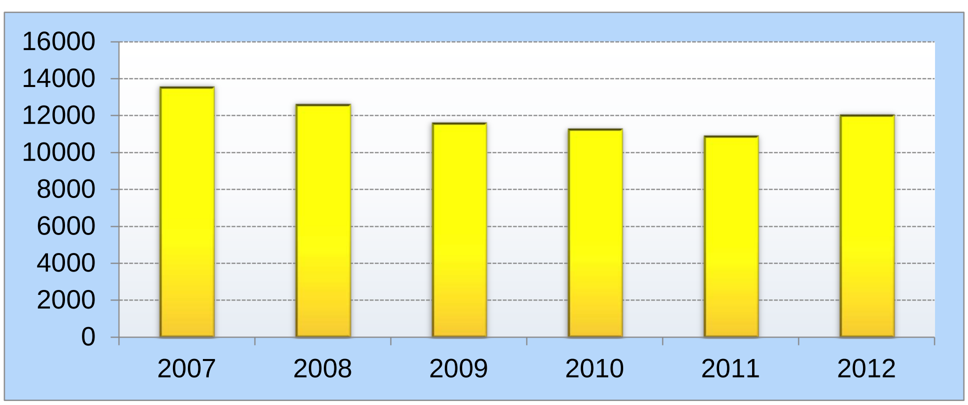

Figure 3-1 – Number of Aircraft Advisories Issued by Barrow FSS, 2007-2012
Source: FAA, 2013

The FAA's Form 5010, *Airport Master Record*, also estimates aircraft operations at Barrow Airport. Table 3-8 lists the operations estimated on the latest Form 5010 (dated March 7, 2013; last inspection date September 7, 2012).

Table 3-8 – Barrow Airport Master Record (Form 5010) Operations

Operation Type	Number of Operations
Air Carrier	1,460
Air Taxi	6,000
GA Local	3,000
GA Itinerant	1,500
Military	50
Total Operations	12,010

Fleet Mix and Based Aircraft

Table 3-9 below lists the fleet of aircraft, by commercial carrier or agency, that landed at Barrow Airport at least once during 2012 (RITA, 2013). Some smaller aircraft, such as the Cessna 200-series aircraft, are listed together as a single category.

Table 3-9 – Current Fleet Mix Using Barrow Airport

Carrier	Aircraft	
Alaska Airlines	▪ Boeing 737-400	▪ Boeing 737-700
Alaska Central Express	▪ Beech 1900	
Arctic Helicopters	▪ Robinson 44 (helicopter)	
Arctic Transportation	▪ Casa/Nurtanio C212 Aviocar	▪ Pilatus PC-12
Avjet Corporation	▪ McDonnell Douglas DC-8-72	
Bering Air Inc.	▪ Beech 1900 ▪ Beech 200 Super Kingair	▪ Cessna 208 Caravan
Era Aviation	▪ Beech 1900	▪ DeHavilland DHC-8
Frontier Flying Service	▪ Shorts 330	
Grant Aviation	▪ Beech 200 Super Kingair	
Hageland Aviation Service	▪ Beech 1900 ▪ Cessna 206/207/209/210 Stationair	▪ Cessna 208 Caravan ▪ Cessna 406 Caravan II ▪ Piper PA-31 Navajo
Lynden Air Cargo Airlines	▪ Lockheed L100-30	
Miami Air International	▪ Boeing 737-400	
North Slope Borough	▪ Beech 200 Super Kingair ▪ Bell 412 (helicopter)	▪ Learjet
Northern Air Cargo	▪ Boeing 737-100/200	▪ Boeing 737-300
Peninsula Airways, Inc.	▪ Saab-Fairchild 340/B	
Tatonduk Outfitters, Ltd.	▪ McDonnell Douglas DC-6A	▪ McDonnell Douglas DC-9-30
Warbelow's Air Ventures	▪ Piper PA-31 Navajo	
United States Coast Guard	▪ C-130	▪ MH-60 Jayhawk (helicopter)

The TAF identifies the number of based aircraft at Barrow as ranging from a high of 19 down to a low of eight over the past decade (see Table 3-10). The FAA's Form 5010, *Airport Master Record*, also indicates eight based aircraft.

Table 3-10 – Terminal Area Forecast Based Aircraft, 2003-2012

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Aircraft	18	19	19	19	19	19	8	8	8	8

Passengers

Passenger traffic at Barrow Airport has been increasing steadily over the past 10 years, growing at a compound annual rate of approximately 2.02% (Figure 3-2). A general upward trend in passenger traffic has continued since the early 1980s, with 2012 seeing an all-time high of 43,673 enplanements.

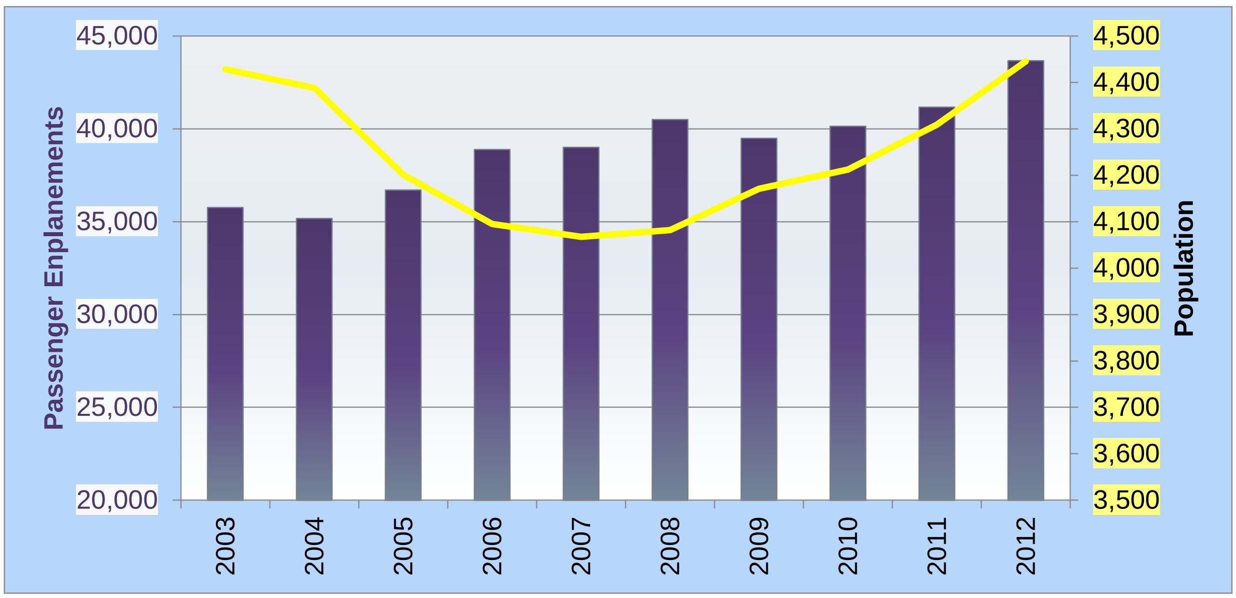

Figure 3-2 – Historic BRW Passenger Enplanements and Barrow Population, 2003-2012

Source: RITA, 2013

It is worthwhile to point out that passenger enplanements do not correlate with the resident population of Barrow. In Figure 3-2, you can see that while the population of Barrow declined from 2003 to 2007, enplanements continued to increase. The Barrow population has been steadily increasing since 2007, with a net population growth of 1.7%. During that same time period, passenger enplanements grew at a rate of 1.9%.

Oil prices and the overall economy may better explain the growth in passenger enplanements in Barrow. Figure 3-2 shows the increase in enplanements from 2006 to 2008 as oil prices rapidly increased and then a dip in 2009 as the Great Recession hit Alaska. There is then a recovery in enplanements in 2010 as the Alaska economy recovered and a sharper rise in 2011 as oil prices climbed back toward $100/barrel. This pattern is possibly attributable to rising NSB property tax revenues associated with higher oil prices, greater spending on capital projects, and more trips to Barrow associated with increased oil exploration.

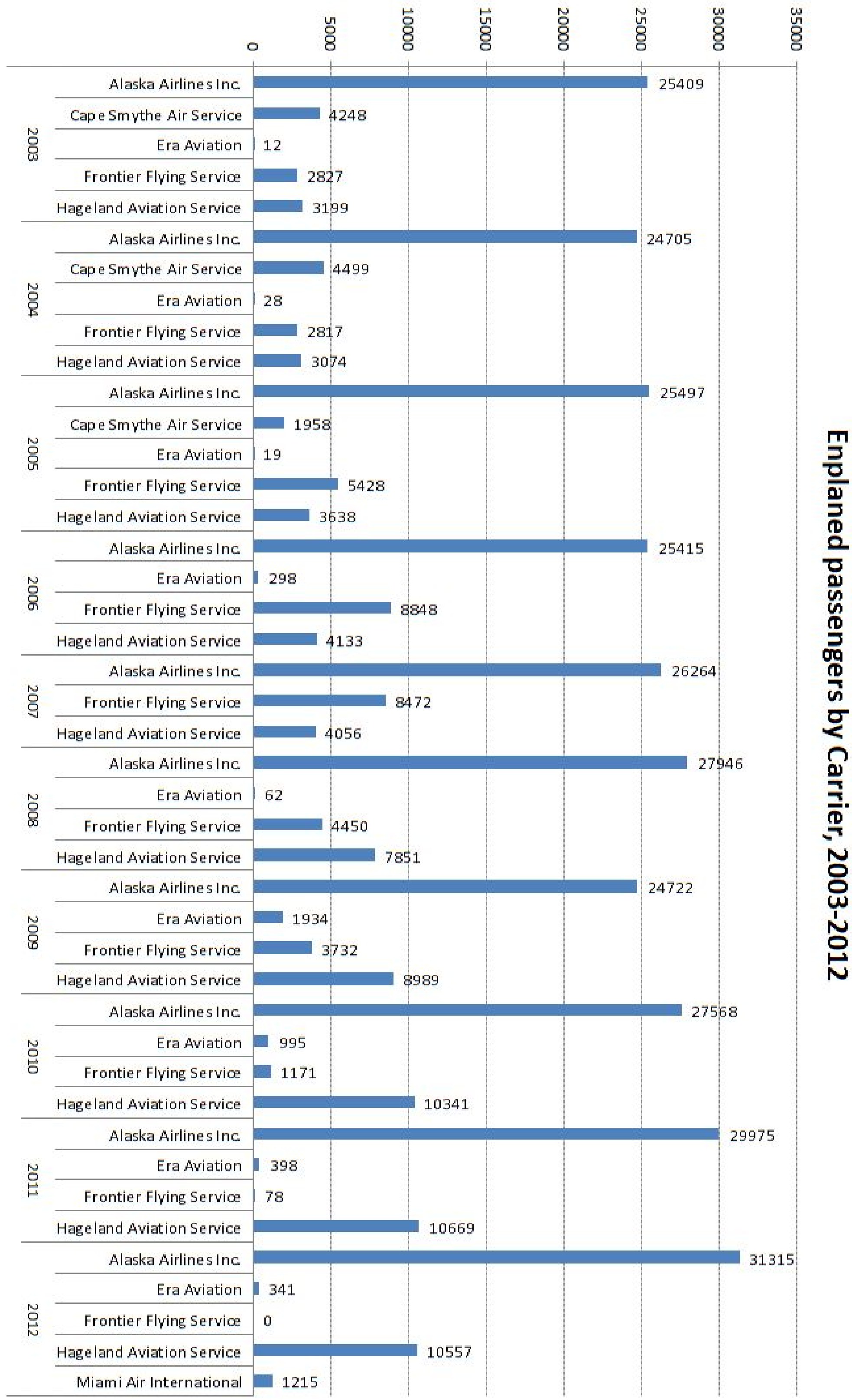

Figure 3-3 – Barrow Enplaned Passengers by Carrier, 2003-2012
source: ACAIS

Air carriers and air taxis currently providing scheduled passenger service to/from Barrow include:

- Alaska Airlines
- Era Alaska
  - Hageland Aviation Service
  - Era Aviation

Other air taxis provide periodic, on-demand passenger charters to Barrow from nearby villages and the larger population centers of Fairbanks and Anchorage. Additionally, Miami Air International provided chartered passenger service to Barrow for several weeks during 2012 to support Royal Dutch Shell's offshore oil exploration. The Miami Air charters carried 88 passengers aboard 737-400 aircraft direct from Anchorage. These passengers were transported to Shell's offshore oil exploration rigs via contract helicopters. Over 1,200 Shell workers passed through BRW, representing over 2% of total 2012 enplanements. There is also a seasonal helicopter charter operating from BRW.

Figure 3-3shows the breakdown of passenger enplanements by carrier. Since 2003, Barrow has seen an increase in passenger enplanements but a consolidation of passenger service to two primary carriers. Alaska Airlines accounts for the majority of scheduled passenger enplanements at BRW, with 31,315 in 2012. Hageland Aviation Service carries the next most passengers, with 10,557 enplanements in 2012.

Freight and Mail

Air transportation of freight and mail to rural Alaska is critical to the sustainability of communities that are not connected to the road system. Coastal communities such as Barrow can receive barge shipments during the ice-free months, but rely on air service to deliver goods the rest of the year.

The introduction of the bypass mail program in 1985 allowed rural Alaskans to send and receive First Class mail at Fourth Class rates. Delivery of mail by air at these favorable rates has facilitated the flow of goods to rural Alaska. Bypass mail destined for Barrow is trucked to Deadhorse and then flown to Barrow.

Figure 3-4 shows the historic mail volumes passing through BRW from 2003 to 2012. Mail volumes have been consistent during this time, with approximately 11 million pounds deplaned and 2.6 million pounds enplaned at BRW. Mail that is enplaned in Barrow is generally bound for the outlying North Slope villages.

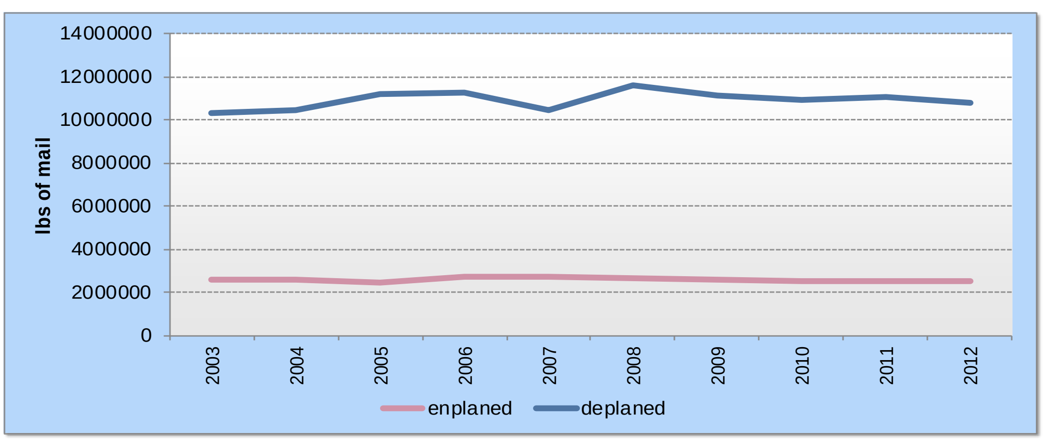

Figure 3-4 – BRW Mail Volumes, 2003-2012
Source: RITA, 2013

Figure 3-5 outlines the historic freight volumes passing through BRW. While not as consistent as the mail volumes, the 10-year trend for freight shows a slight increase in the amount of Barrow-bound freight (indicated as "deplaned") and a slight decrease in outbound freight (indicated as "enplaned"). The increase in inbound freight is likely due to recent large capital projects such as the airport reconstruction and the new hospital.

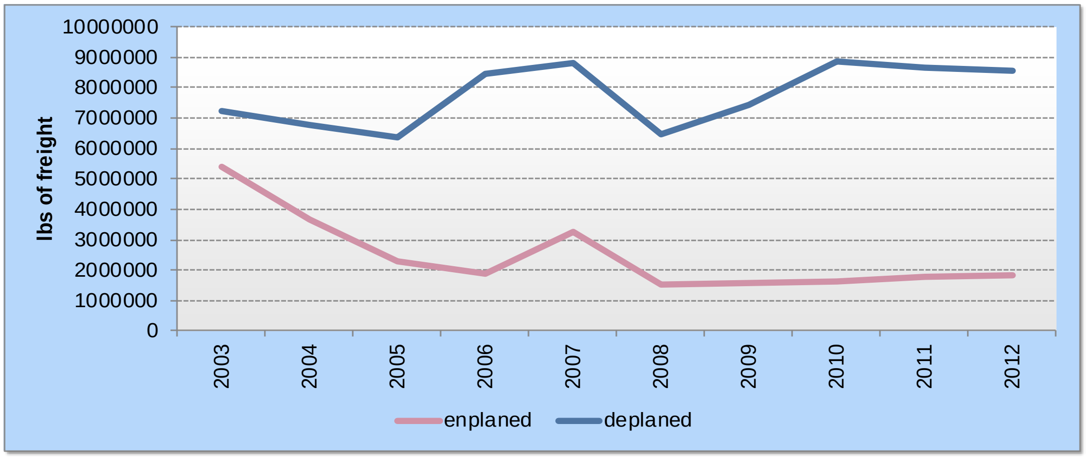

Figure 3-5 – BRW Freight Volumes, 2003-2012
Source: RITA, 2013

As at other Alaska hub airports, freight and mail destined for outlying communities are transported to Barrow on larger jet aircraft and then transferred to smaller commuter aircraft for distribution to these communities. This is clear in the breakdown of carriers transporting inbound versus outbound freight and mail (Figure 3-6; see Table 3-9 for a summary of the aircraft types each carrier uses).

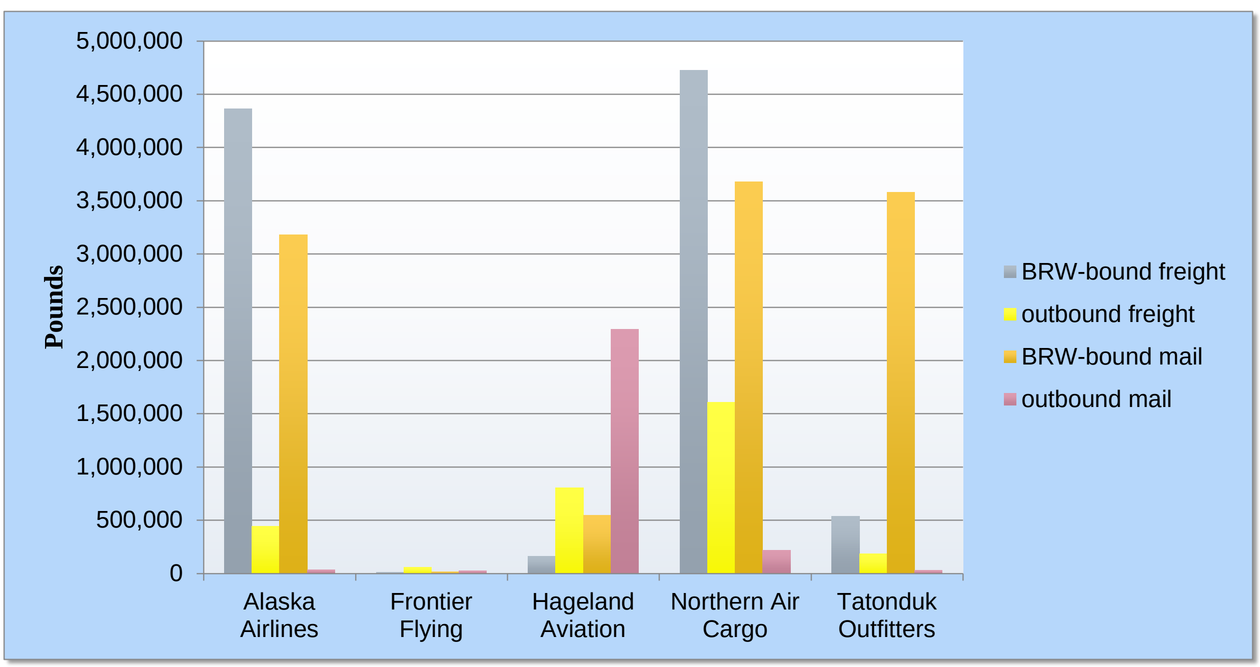

Figure 3-6 – Inbound versus Outbound Mail and Freight by Carrier, 2012
Source: RITA, 2013

As shown in Figure 3-6, Hageland Aviation delivers the majority of outbound mail to the surrounding communities, while Hageland and Northern Air Cargo carry the bulk of outbound freight. Conversely, Alaska Airlines, Northern Air Cargo, and Tatonduk Outfitters carry nearly all of the mail to Barrow, and Alaska Airlines and Northern Air Cargo transport most of the inbound airborne freight.

Air Traffic Data Collected During This Master Plan Update

The project team interviewed airport tenants and users, conducted online surveys, collected schedules, and factored in weather delays to supplement and validate published aircraft operation data. The resulting estimate of operations is presented in Table 3-11 below for comparison with the air traffic activity as reported by the FAA TAF, FAA 5010 Master Record, Northwest Alaska Transportation Plan, AASP, 2000 Barrow Airport Master Plan, and NPIAS.

The base year estimate of operations was compared with the number of Airport Advisories issued by the Barrow FSS. Since most pilots request this information during departure and landing, this served as a proxy for Air Traffic Control records that a towered airport would have. In 2012, FSS issued 12,060 Airport Advisories, which is close to the estimate of 12,865 operations.

Table 3-11 – Estimate of Aircraft Operations Based on Schedules and Contacts, 2012

Operator	Service	Scheduled Operations		Actual Operations[4]
		Frequency	Annual	
Alaska Airlines	Air Carrier	18/week	1,872	1,852
Era Alaska[5]	Commuter	46/week	4,784	4,473
Northern Air Cargo	Air Carrier	3/week	312	292
Everts Air Cargo	Air Carrier	3/week	312	292
Miami Air	Air Carrier	28/season	28	56
NSB SAR	GA	—		2,400
USCG	Military Transient	—		350
Air National Guard	Military Transient	—		150
Part 91 Transient	GA	—		2,000
Part 91 Local	GA	—		1,000

[4] Based on conversations with carriers and considering weather-related cancellations
[5] Era Alaska includes Era Aviation, Frontier Flying Service, and Hageland Aviation Service

Air Traffic Base-Year Summary

Table 3-12 presents a comparison of estimated base year (2012) aviation activity at Barrow Airport. The table includes data or estimates from the various sources identified in this report.

Table 3-12 – Historical and Forecast Air Traffic Data for Base Year 2012, Barrow Airport

	Forecast Year	Based Aircraft	Enplanements	Total Operations
2000 Barrow Airport Master Plan	2010	26	50,054	17,198
2004 Northwest Alaska Transportation Plan	2010	—	44,544	—
Alaska Aviation System Plan	2008	19	40,673	16,666
FAA TAF	2012	8	42,077	12,010
NPIAS	2013	8	40,141	—
FAA ACAIS	2012	—	43,673 (actual)	—
Form 5010	2012	8	—	12,010
PDC Estimate	**2012**	**9**	**43,673 (actual)**	**12,865**

3.4 Step 4 – Select Forecast Methods

While there are several acceptable techniques and procedures for forecasting aviation activity at a specific airport, most forecasts utilize basic statistical techniques such as linear regression, exponential smoothing, or share analysis. To determine which method is most appropriate, it is important to look at the factors affecting aviation demand. The following discussion is an overview of the factors affecting aviation demand at Barrow and the forecast method applied.

3.4.1 Economic Trends Affecting the Barrow Airport[6]

This section discusses economic trends affecting the Barrow Airport and provides a population forecast based on anticipated economic activity. While this analysis has considered both oil and gas activity and tourism, research suggests that tourism is going to have a minor impact on Barrow's population and the demand for aviation as compared to impacts of anticipated oil and gas activity.

Barrow Population Forecast

Northern Economics expects significant growth in the NSB and in Barrow as a result of future oil and gas activities. This section looks at a demographic-based population projection for 2010–2035 and then presents an economics-based projection that extends to 2050. Later sections go into detail about assumptions for oil and gas activities and tourism.

[6] Section 3.4.1 prepared by Northern Economics Inc.

The Alaska Department of Labor & Workforce Development (ADOL&WD) prepares population forecasts at the borough or census area level. The current forecast for the NSB, covering the years of 2010 through 2035, is shown in Figure 3-7. This projection is based on births, deaths, and migrations, and does not account for economic factors.

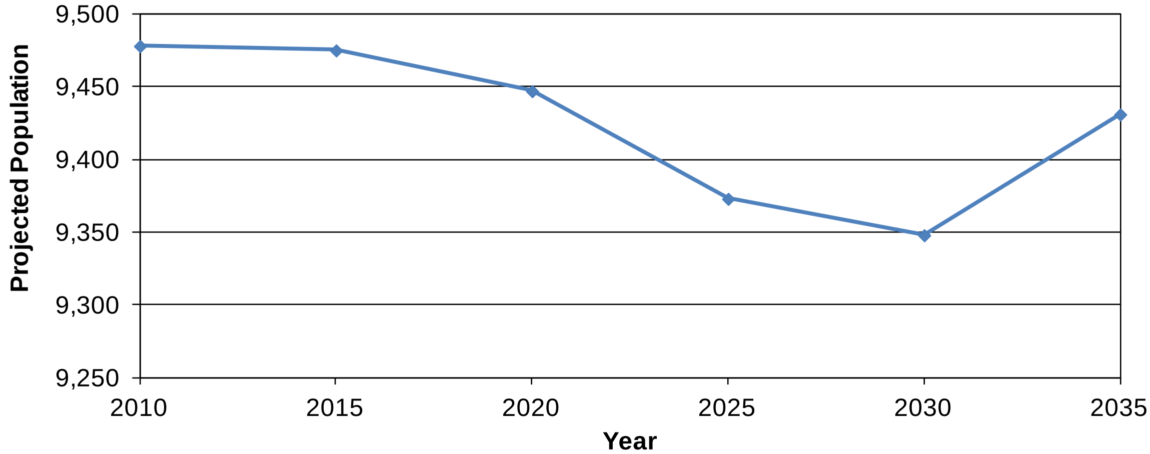

Figure 3-7 – Projected Population of the North Slope Borough, ADOL&WD, 2010–2035
Source: ADOL&WD (2013a) and Northern Economics, Inc. analysis

For planning purposes, it is important to consider the impact of economic conditions on population change in the NSB. As part of the socioeconomic studies associated with the Alaska Pipeline Project, Northern Economics used a dynamic economic impact model and a set of reasonably foreseeable future actions to develop population projections for the NSB for 2010–2050. Draft population projections from the regulatory filings are shown in Figure 3-8. These projections are based on the No Action Alternative, which does not include development associated with the Alaska Pipeline Project, but does include other anticipated oil and gas activities, as discussed in detail in the next section.

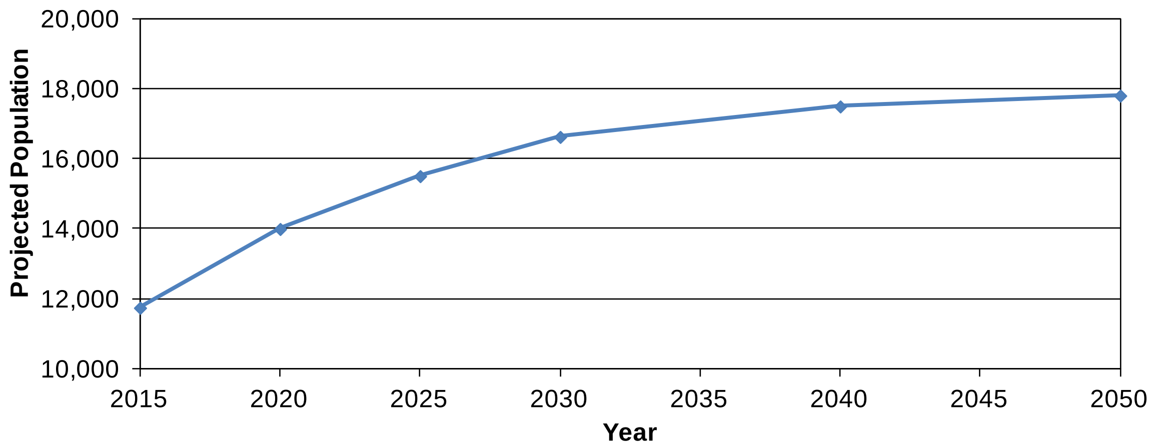

Figure 3-8 – Projected Population of the North Slope Borough, Alaska Pipeline Project's No Action Alternative, 2015–2050
Source: TransCanada and ExxonMobil (2011)

As shown in the figure, the NSB's population is anticipated to increase from 11,750 in 2015 to 17,810 in 2050 as a result of reasonably foreseeable future activities.

On average, Barrow has accounted for 60 percent of the NSB's population, based on U.S. Census Bureau counts and ADOL&WD estimates for 1980–2009 (from Northern Economics' internal database). The 2010 Census broke from the prior censuses and included several hundred oilfield workers who had not been recorded before. For the period of 2010 through 2012, Barrow has accounted for about 45 percent of the newly defined NSB population (ADOL&WD 2013b).

Assuming Barrow's 45 percent share of the borough's population holds true in the future, Figure 3-9 presents a population projection for Barrow for 2015–2050. The population is expected to grow to approximately 8,000 people by 2050 from an estimated 4,445 people as of 2012.

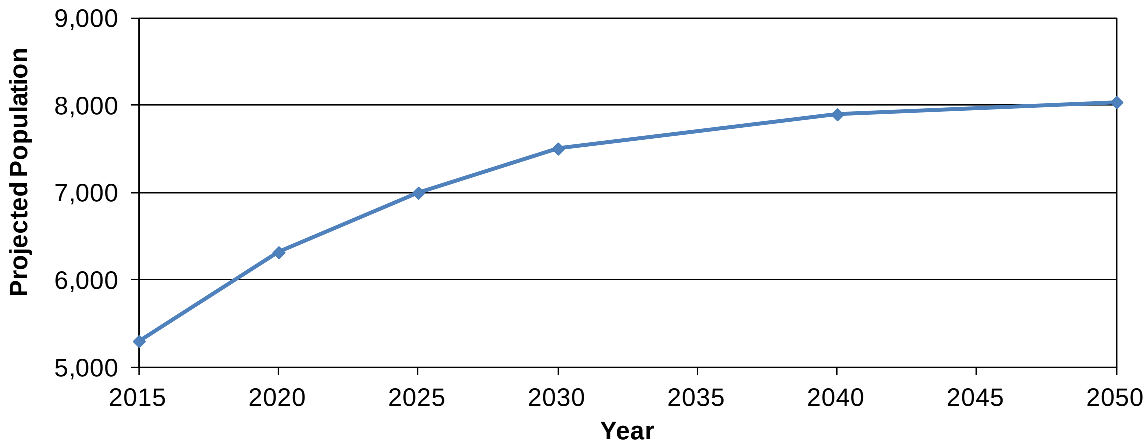

Figure 3-9 – Projected Population of Barrow, 2015–2050

Source: TransCanada and ExxonMobil (2011) and Northern Economics, Inc. analysis

Factors Affecting the Forecast

Two primary drivers of the forecast are activities associated with oil and gas development and a growing tourism sector. Of the two, oil and gas activity shows substantial opportunity for economic growth in Barrow and elsewhere in the NSB, while tourism appears to be stable. Each of these drivers is discussed below.

Economic and Demographic Effects of Anticipated Oil and Gas Development

While most of the oil and gas industry activity on the North Slope to date has been limited to where the existing oil field units/facilities are located—Prudhoe Bay, Kuparuk, and Alpine—certain industry activities such as stakeholder engagement, permitting, planning, and baseline studies take place in Barrow. Barrow serves as the regional hub for the North Slope communities and is also the administrative center for the NSB. There are state and federal agencies based in Barrow, as well as a number of businesses that provide support services to oil field operations. An increase in oil and gas activity in the NSB would also result in an increase in the level of economic activity in Barrow.

It is anticipated that oil and gas development would lead to workforce training opportunities, local jobs, and increased community investment, as well as tax revenue for the NSB, which creates significant employment multiplier effects in the region. Along with these economic changes would be social and demographic changes that would occur in local communities over the next two decades.

Figure 3-10 shows the different oil and gas activities occurring on the North Slope as of December 2012. See also Figure 2-1 for locations of Chukchi Sea offshore leases.

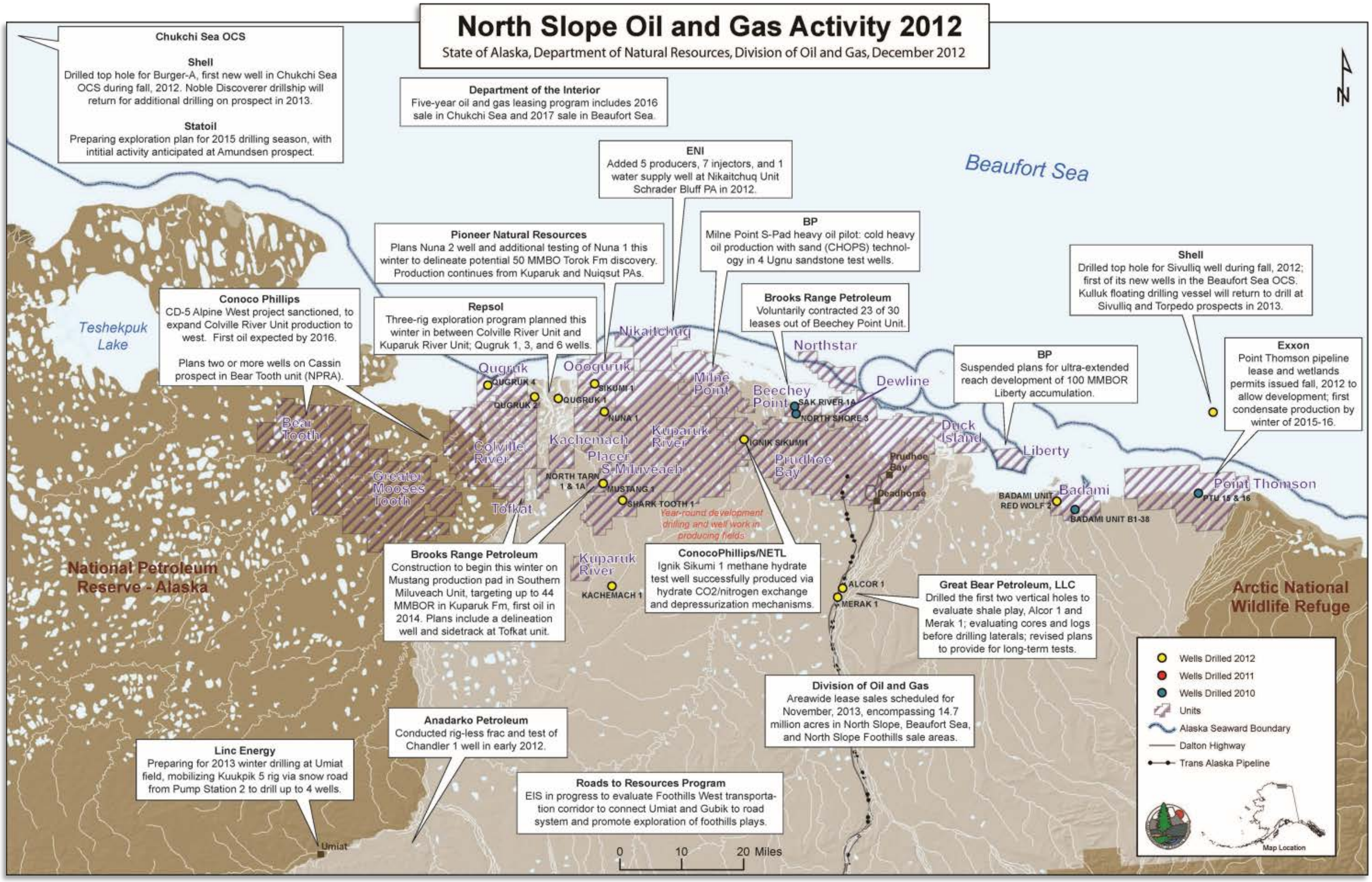

Figure 3-10 – North Slope Oil and Gas Activity 2012

Source: ADNR (2012)

Current on-shore and nearshore activities include:

- ConocoPhillips's CD-5 project, which is expected to start producing oil by 2016
- ENI's additional well work on the Nikaitchuq unit
- BP's heavy oil project on Milne Point
- Exxon's permitting activities for the Point Thomson development to allow development and production by winter of 2015-2016
- Pioneer Natural Resources' continued production from Kuparuk and Nuiqsut and additional testing and drilling (Nuna) to delineate a potential 50 million-barrel oil discovery
- Brooks Range Petroleum's Mustang project that is planned to begin construction winter 2012-2013, with first oil expected in 2014
- Repsol's three-rig exploration program planned this winter
- Great Bear Petroleum, LLC's drilling activities (oil from shale)
- Linc Energy's preparation for 2013 winter drilling at the Umiat field involving mobilization of a rig via ice road from Pump Station 2 to drill up to 4 wells
- Anadarko's fracking and testing at Chandler prospect

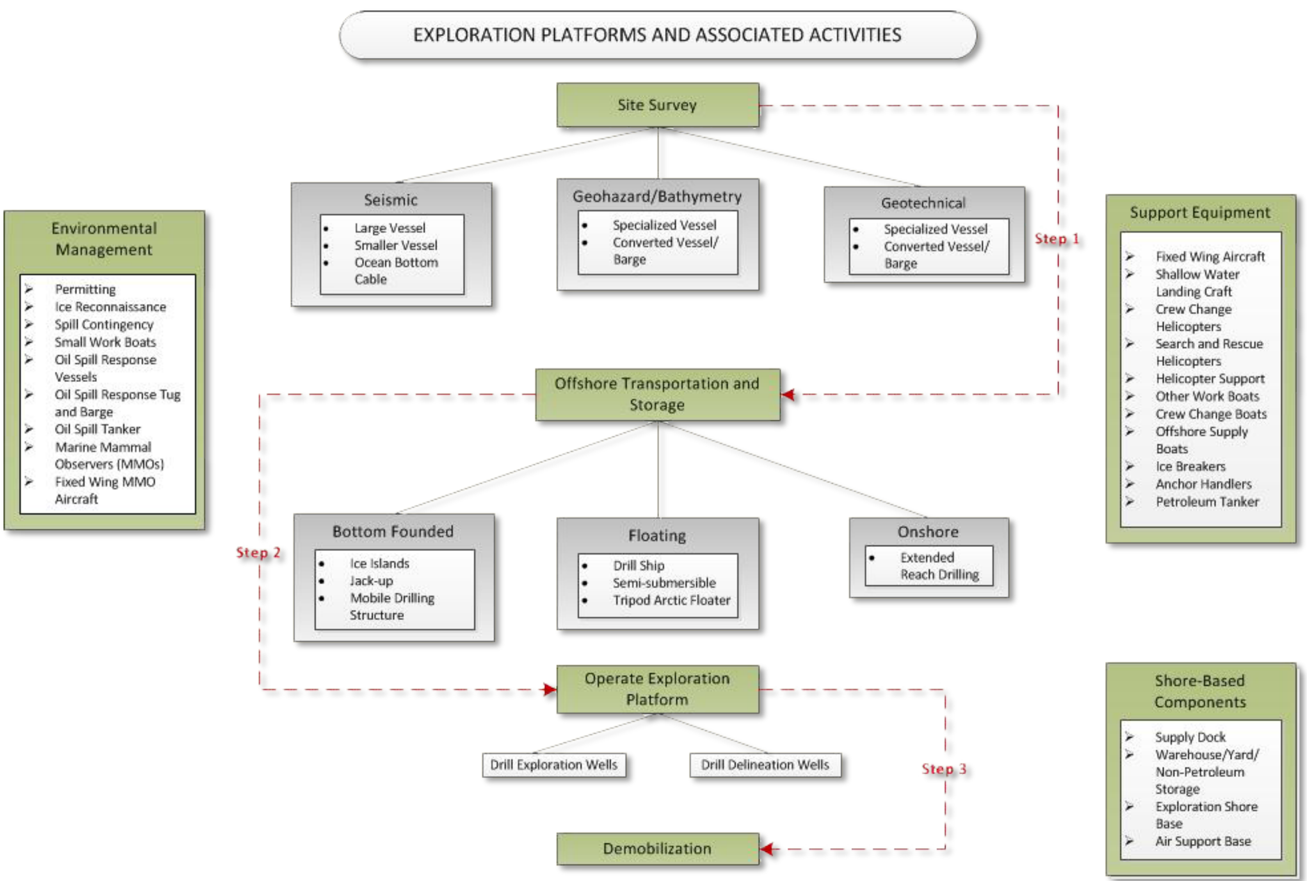

Figure 3-11 – Exploration Activities Associated with Oil and Gas Development in the OCS

Source: Northern Economics, Inc.

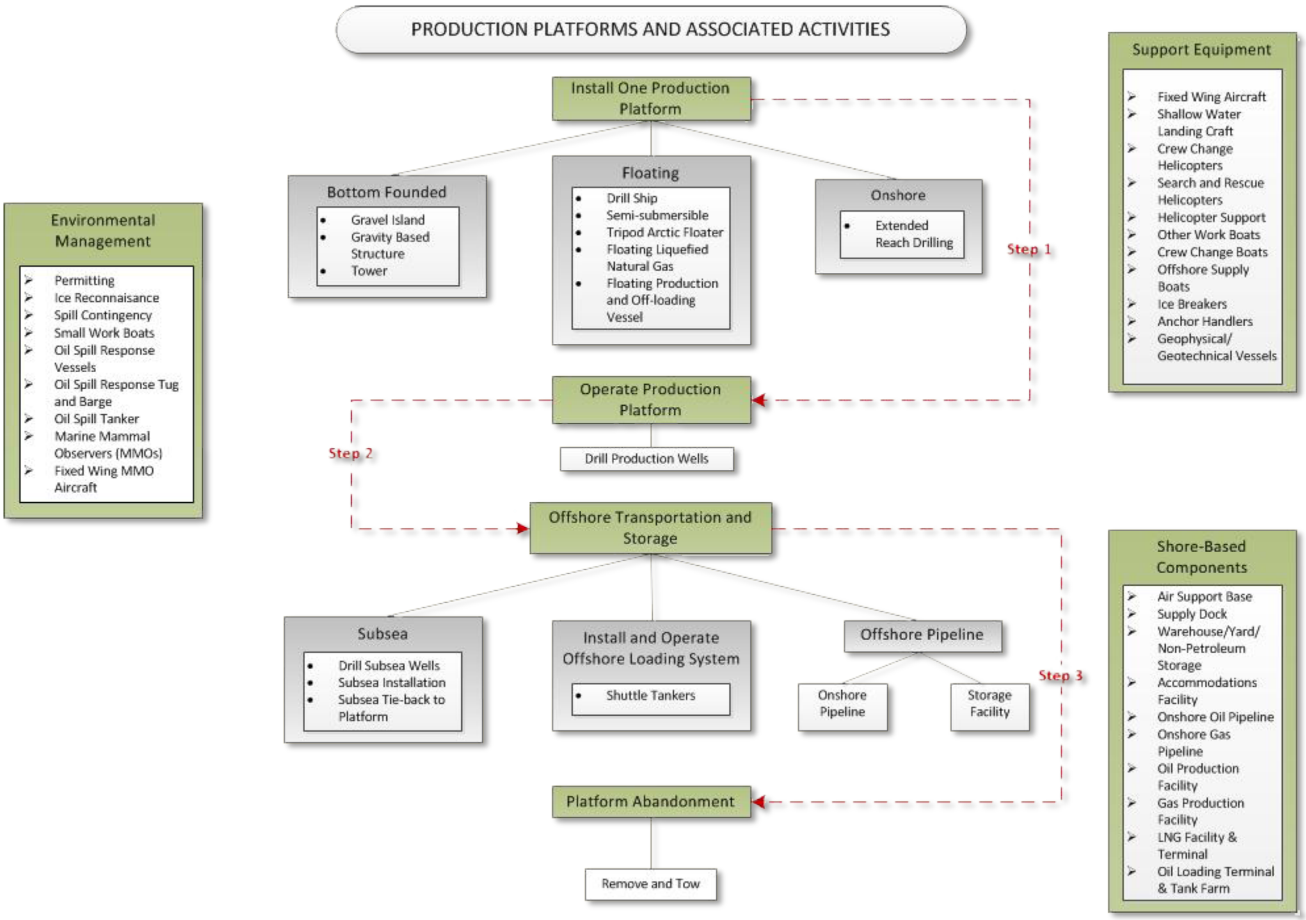

Figure 3-12 – Production Activities Associated with Oil and Gas Development in the OCS

Source: Northern Economics, Inc.

With respect to oil and gas activities in the Outer Continental Shelf (OCS), consisting of the Beaufort and Chukchi Seas, Shell has already started exploratory drilling in its Sivulliq and Burger prospects. Shell has recently announced suspension of drilling activities in 2013, but it is expected to continue exploration activities in the near future. Statoil has started stakeholder consultations and baseline studies in preparation for exploration for its Amundsen project. Exploratory drilling is planned for the year 2015. ConocoPhillips has also started planning for exploration activities for its Devil's Paw prospect in the Chukchi Sea. The companies' exploration plans indicate a shorebase for air transportation will be located at the Deadhorse Airport. However, search and rescue aircraft (helicopter) will be stationed in Barrow in support of the drilling operations. Beyond the exploration phase, subsequent development and production activities in the OCS would require significant manpower resources and infrastructure. Figure 3-11 and Figure 3-12 are graphic representations of the nature of exploration and production activities associated with oil and gas development in the Beaufort and Chukchi OCS.

In addition, the U.S. Coast Guard officially began aviation operations in Barrow. The USCG program, called Arctic Shield 2012, is the largest deployment in the region to date and will allow 24-hour search and rescue. The Coast Guard sent two MH-60 Jayhawk helicopters with support teams to Barrow to reduce response time to incidents in the Chukchi and Beaufort Seas. From July to October 2012, the

Coast Guard had two teams working from a rented hangar at the Wiley Post-Will Rogers Memorial Airport in Barrow. The crew followed the same rotation used by North Slope oil workers, with 2 to 3 weeks at the location at a time. The aviation and the communications detachment included a total of 26 people (*Alaska Journal of Commerce*, July 2012).

This future industrial development is expected to reverse the declining trend in the region's population. Figure 3-13 shows the historical population in the community of Barrow from 2000 to 2011. In the future, the community is expected to see in-migration from former residents and from neighboring communities who moved to larger communities to seek employment opportunities.

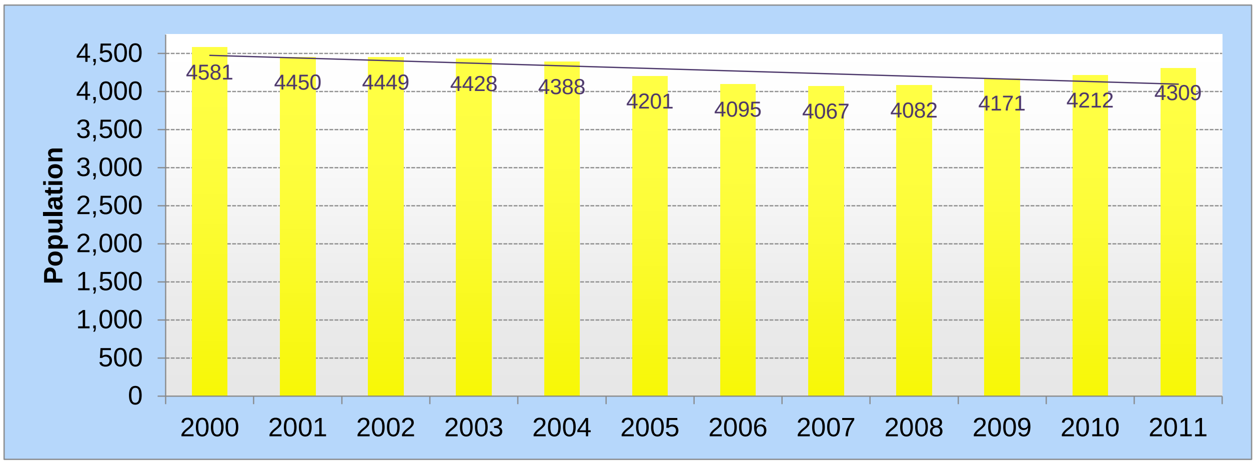

Figure 3-13 – Population in Barrow, 2000-2011
Source: ADOL&WD (2013b) and Northern Economics, Inc. analysis

The projected increase in employment and population is based on a structural economic forecasting and policy analysis model that integrates input-output, computable general equilibrium, econometric and economic geography methodologies. The model is dynamic, incorporating economic responses to wage, price, and other economic and demographic factors, on forecasts and simulations generated on an annual basis through the year 2050. Projected employment and population changes in Barrow are primarily attributed to the reasonably foreseeable future oil and gas activities in the North Slope. The model assumptions resulted from an information collection process aimed at deriving a reasonably foreseeable portrait of the economic future for Alaska. The assumptions reflect the combined information from published reports, project proponents, and statements from industry and government representatives.

Economic and Demographic Effects of Anticipated Tourism Growth

Northern Economics interviewed three tour companies that provide Barrow trips. Major attractions for tourism are Point Barrow (the northernmost point of the United States and a place where tourists can touch the Arctic Ocean), wildlife viewing, the whale harvest, and the Iñupiat Heritage Center. While all three operators said that their businesses are doing well post-recession, only one indicated that there was a strong upward trend in business.

One of the attractions for a trip to Barrow is the Iñupiat Heritage Center. Northern Economics contacted staff at the center to learn about trends and to gather visitation information that serves as a proxy for tourism activity. Visitor numbers for the last 10 years are shown in Table 3-13. While the center has had a fairly consistent number of visitors each year, there are no strong trends suggesting growth in either Tundra Tours or general traffic.

Table 3-13 – Iñupiat Heritage Center Visitor Numbers, 2003–2012

Source: Glenn (2013)

Year	Number of Visitors		
	Tundra Tours	General Public	Total
2003	—	14,875	**14,875**
2004	—	17,183	**17,183**
2005	—	21,456	**21,456**
2006	3,654	13,698	**17,352**
2007	2,431	15,476	**17,907**
2008	2,321	11,118	**13,439**
2009	1,565	16,700	**18,265**
2010	1,764	16,077	**17,841**
2011	1,745	17,445	**19,190**
2012	1,926	13,241	**15,167**

3.4.2 Forecast Method

Passenger enplanements, aircraft operations, and cargo shipments are not directly correlated with the population trends of Barrow or the NSB. Consequently, forecasting future aviation activity at Barrow Airport is not simply a matter of applying a growth rate based solely on population growth. Instead, a realistic forecast must consider other factors such as oil exploration, economic growth, tourism, State spending, and other factors. The following three scenarios outline the methods for forecasting aviation activity for Barrow Airport.

Low Growth Scenario

The low growth scenario represents a situation in which oil and gas exploration is minimal or non-existent. Oil prices remain steady or decline due to weak world economies and exploration in the region is stagnant. Likewise, USCG presence at Barrow is minimal and no base of operations is developed. Barrow population growth continues at historic levels.

The population of Barrow has grown at a compound annual rate of approximately 0.50% over the past 20 years. With no oil exploration in the region it is reasonable to expect that aviation demand will not continue to increase at the recently observed rates. Therefore, this rate (0.50%) was chosen to represent the aviation demand growth under the low growth scenario, and was applied to passenger enplanements, cargo, and operations. Factors contributing to the low growth scenario include:

- Aircraft operations related to oil exploration (charter flights for crew changes, helicopter support, USCG monitoring, etc.) cease

- Stagnant oil prices mean NSB and State revenues remain flat or decrease, thereby reducing capital expenditures and government travel
- USCG presence returns to pre-exploration levels

Medium Growth Scenario

The medium growth scenario considers continued oil and gas exploration activities similar to those undertaken in 2012. Consequently, the USCG maintains an active presence in the region and begins development of a base of operations at BRW. The population of Barrow continues to grow at recent levels, reflecting an influx of people seeking employment.

A mid-level growth rate of 1.7% was selected to represent the medium growth scenario. This rate reflects the U.S. Department of Energy's baseline forecast of crude oil prices through 2040 and is very close to the recent annual growth rate of the Barrow population (1.65%), the average U.S. Gross Domestic Product (GDP) over the past decade (1.9%), and the average growth rate of enplanements (2.02%) and Barrow-bound cargo (1.7%) for the last 10 years—a period of increasing oil prices and exploration. We believe this is a reasonable growth rate because:

- Aviation activity remains correlated with oil exploration
  - Crew changes and support capabilities (e.g., search-and-rescue)
  - Development of support infrastructure (personnel housing, warehouses, etc.)
- Moderate growth in oil prices allows Borough and State spending on capital projects, as well as government-related travel to the region
- USCG presence continues at 2012 levels

High Growth Scenario

The high growth scenario is based on increased offshore oil exploration, new Barrow-based onshore oil and gas exploration (NPR-A), continued USCG presence, and growth in the tourism sector. This scenario assumes world economies show strong recovery and North Slope oil prices rise.

To forecast the growth under this scenario, we chose a growth rate of 3.0%. This is based on the forecast U.S. GDP growth rate of 3%. As domestic GDP grows, demand for oil typically follows (US Energy Information Administration, 2013). Domestic, as well as global demand for oil will likely result in increased oil exploration and production activity across Alaska's North Slope. The increased activity will lead to increased demand for air travel as workers are transported to the region.

The high growth scenario considers:

- Increasing oil and gas exploration in the Chukchi Sea
- New onshore oil and gas exploration in the western NPR-A
- USCG presence in Barrow and development of facilities
- Accelerated private development of support facilities such as warehouses and crew housing that requires freight shipments via air, additional construction personnel, etc.
- Increasing North Slope oil prices and subsequent increases in NSB revenues
- Increasing Barrow population

3.5 Steps 5 & 6 – Apply Forecast Methods, Evaluate Results, and Summarize

This section applies the three growth scenarios discussed above to develop air traffic forecasts for passenger enplanements, cargo, and aircraft operations for Barrow Airport for the next 20 years.

Figure 3-14 shows the historical and forecast passenger enplanements for Barrow Airport. The low, medium, and high growth scenarios are presented, as well as the TAF (for comparison per FAA guidance, *Forecasting Aviation Activity by Airport*).

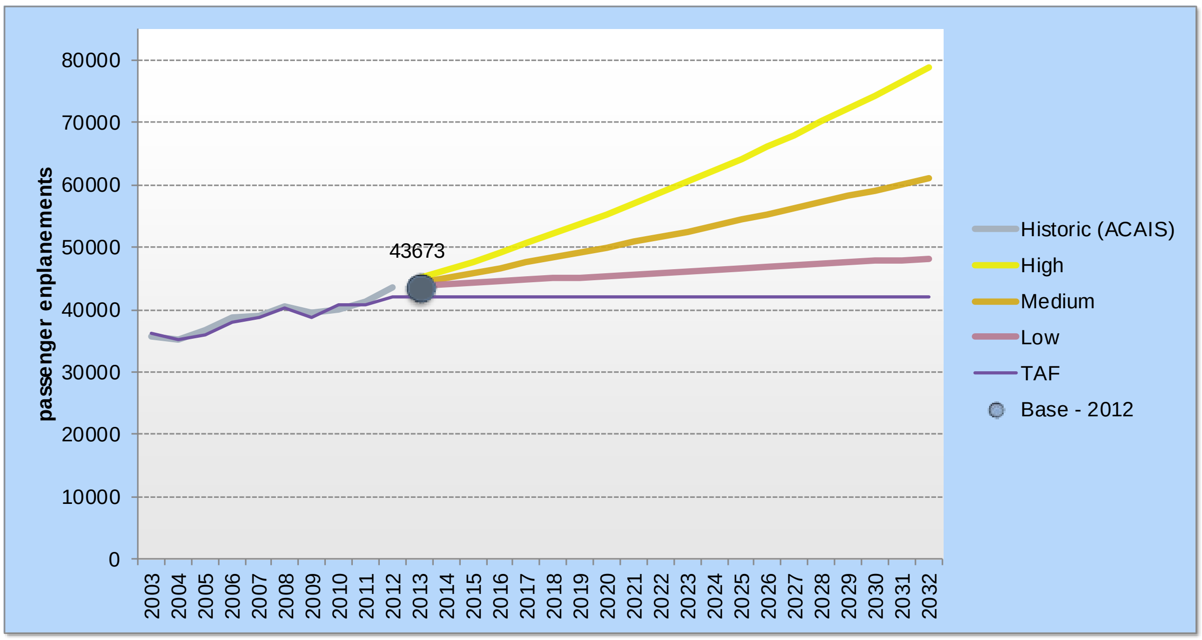

Figure 3-14 – Historic and Forecast Passenger Enplanements

Figure 3-15 shows historic and forecast cargo volumes (enplaned and deplaned) for Barrow Airport. Cargo includes freight and mail. Showing cargo volumes prior to 2003 would be misleading because the changes to the Rural Air Service Improvement Act in 2002 changed the reporting requirements for freight and mail.

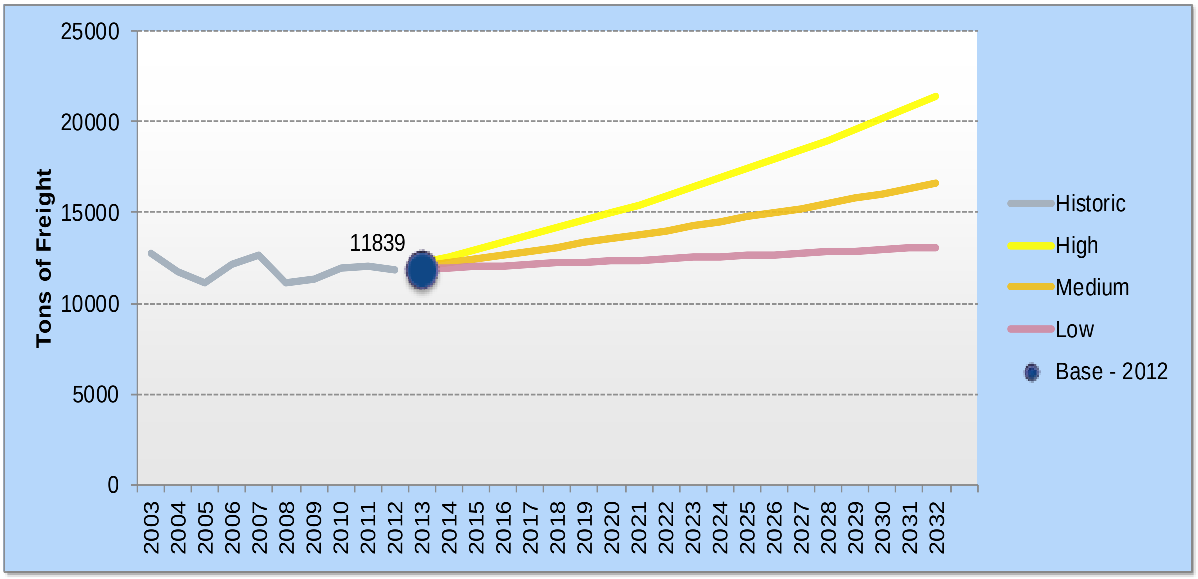

Figure 3-15 – Historic and Forecast Cargo Volumes

Figure 3-16 shows the high, medium, and low forecasts of aircraft operations, as well as the Terminal Area Forecast. The TAF is not updated for BRW and does not reflect actual conditions.

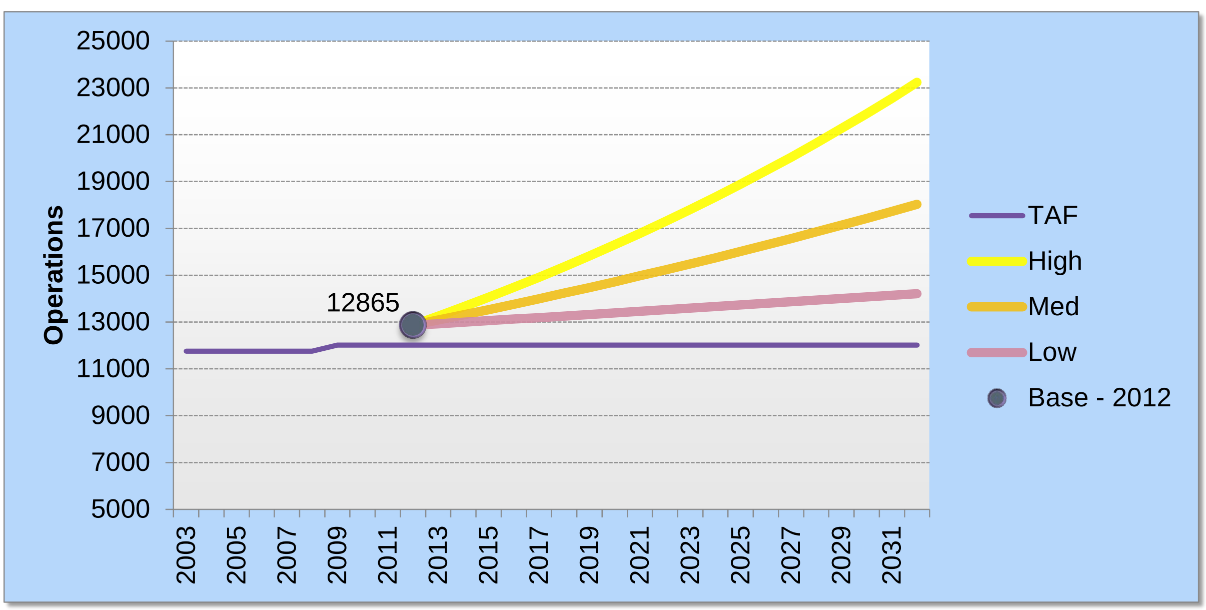

Figure 3-16 – Aircraft Operations Forecast and Historic TAF Operations

3.6 Step 7 – Compare Airport Planning Forecast Results with TAF

Table 3-14 compares the updated air traffic forecast for Barrow Airport (using the medium scenario growth rate of 1.7%) to the FAA TAF. As mentioned previously, the TAF for BRW is not updated frequently and does not reflect actual conditions at the airport.

Table 3-14 – TAF/Airport Planning Forecast Comparison

	Year	Airport Forecast (AF)	TAF	AF/TAF % Difference
Enplanements				
Passenger Enplanements	2012 2017 2022 2032	43,673 47,514 51,692 61,183	42,077 42,077 42,077 42,077	4% 13% 23% 45%
Operations				
Commercial Operations	2012 2017 2022 2032	6,965 7,577 8,243 9,758	7,460 7,460 7,460 7,460	(7%) 2% 10% 31%
Military Operations	2012 2017 2022 2032	500 544 592 700	50 50 50 50	900% 988% 1084% 1300%
GA Operations (local + itinerant)	2012 2017 2022 2032	5,400 5,875 6,391 7,565	4,500 4,500 4,500 4,500	20% 31% 42% 68%
Total Operations	**2012** **2017** **2022** **2032**	**12,865** **13,996** **15,227** **18,023**	**12,010** **12,010** **12,010** **12,010**	**7%** **17%** **27%** **50%**

3.7 Step 8 – Obtain FAA Approval

FAA AC 150/5070-6B provides guidance on airport master plans. The chapter on aviation forecasts concludes that forecasts must be:

- Realistic
- Based on the latest available data
- Reflect the current conditions at the airport
- Supported by information in the study
- Provide an adequate justification for the airport planning and development

FAA AC 150/5070-7, *The Airport System Planning Process*, recommends that aviation forecasters use their professional judgment in determining what is reasonable. PDC believes that this forecast represents a realistic outlook of aviation demand at Barrow Airport.

The FAA approved this forecast on August 29, 2013 (see Appendix A for approval email).

Table 3-15 – Barrow Airport Forecasts and Growth Rates

	Base Year: 2012					Average Annual Compound Growth Rates			
	Base Year	Base +1 Year	Base +5 Years	Base +10 Years	Base +15 Years	Base to +1	Base to +5	Base to +10	Base to +15
Passenger Enplanements									
Air Carrier	32,530	33,083	35,391	38,503	41,889	1.7	1.7	1.7	1.7
Commuter	11,143	11,332	12,123	13,189	14,349	1.7	1.7	1.7	1.7
Total Enplanements	**43,673**	**44,415**	**47,514**	**51,692**	**56,238**	**1.7**	**1.7**	**1.7**	**1.7**
Operations									
Itinerant									
Commercial									
Air Carrier	*1,908*	*1,940*	*2,076*	*2,258*	*2,457*	*1.7*	*1.7*	*1.7*	*1.7*
Commuter/Air Taxi	*4,473*	*4,549*	*4,866*	*5,294*	*5,760*	*1.7*	*1.7*	*1.7*	*1.7*
All-Cargo Carriers	*584*	*594*	*635*	*691*	*752*	*1.7*	*1.7*	*1.7*	*1.7*
Total Commercial	6,965	7,083	7,577	8,243	8,969	1.7	1.7	1.7	1.7
General Aviation	2,000	2,034	2,176	2,367	2,575	1.7	1.7	1.7	1.7
Military	500	509	544	592	644	1.7	1.7	1.7	1.7
Local									
General Aviation	3,400	3,458	3,699	4,024	4,378	1.7	1.7	1.7	1.7
Military	—	—	—	—	—				
Total Operations	**12,865**	**13,084**	**13,996**	**15,226**	**16,566**	**1.7**	**1.7**	**1.7**	**1.7**
Based Aircraft									
Single Engine (Non-Jet)	4	4	4	5	5	0%	0%	25%	0%
Multi Engine (Non-Jet)	2	2	2	2	3	0%	0%	0%	50%
Jet Engine	1	1	1	1	1	0%	0%	0%	0%
Helicopter	2	2	2	2	3	0%	0%	0%	50%
Other	—	—	—	—	—	—	—	—	—
Total Based Aircraft	**9**	**9**	**9**	**10**	**12**	**0%**	**0%**	**11%**	**20%**

3.8 References

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4 Facility Requirements

The next step in the master plan update process is to translate the aviation forecasts into facility requirements. Facility requirements are determined by comparing future facility needs to the airport's existing inventory of facilities, reviewing FAA design criteria to ensure the airport meets safety and operational standards, and considering the need to maintain and improve customer service. Separate requirements analyses were prepared for key elements of the airport.

This chapter consists of:

- Demand-capacity analysis
- Design aircraft selection
- Facility requirements evaluation

4.1 Demand-Capacity Analysis

A demand-capacity analysis is a mathematical method of determining if an airport can handle the current and future aviation activity. It also helps determine the timing and degree to which additional or expanded facilities will be needed.

FAA's standard method for determining airport capacity and delay for long-range planning purposes is presented in AC 150/5060-5, *Airport Capacity and Delay*. This AC and FAA's airport capacity model spreadsheets were used to analyze the airfield requirements by computing:

- Hourly capacity
- Annual service volume
- Average aircraft delays

This approach uses the projections of annual aircraft operations by the anticipated fleet mix as forecast in Chapter 3 in conjunction with a variety of factors that are described in the following sections.

In addition to the updated aviation activity forecasts, the FAA capacity analysis requires knowledge of the airport's airfield characteristics and operational conditions. The elements that affect airfield capacity include:

- Runway configuration
- Aircraft mix index (what types of aircraft are using the airport)
- Taxiway configuration
- Meteorological conditions

When analyzed together, these elements determine the airport's Annual Service Volume (ASV), a generalized estimate of the airport's capacity. The following sections will evaluate each of these capacity characteristics with respect to Barrow.

4.1.1 Runway Configuration

The layout and spacing of runways are important factors in determining airfield capacity. The airfield configuration at BRW consists of a single paved runway, oriented east-west. This corresponds to Runway Use Configuration #1 in Figure 2-1 of AC 150/5060-5 (see also Table 4-2, below).

4.1.2 Aircraft Mix Index

Knowing the mix of the aircraft fleet operating at Barrow is essential to establishing the aircraft fleet mix index. This index is calculated based on the number of operations for the gross weight of the specific aircraft in use:

- **Class A:** Single engine, less than 12,500 lbs.
- **Class B:** Multi-engine, less than 12,500 lbs.
- **Class C:** Multi-engine, 12,500 lbs. to 300,000 lbs.
- **Class D:** Multi-engine, over 300,000 lbs.

The mix index calculation is the percent of Class C aircraft operations plus three times the percent of Class D aircraft operations [%(C + 3D)]. At Barrow, the fleet mix includes only Classes A through C, with Class C aircraft accounting for 20% of the operations, so the mix index is 20.

4.1.3 Taxiway Configuration

Exit taxiways have a considerable impact on airfield capacity since the number and location of exits directly determine the length of time an aircraft occupies the runway. The airfield capacity analysis gives credit to exits located within a prescribed range from a runway's threshold. This range is based upon the mix index of the aircraft that use the runway; at Barrow, the range is 3,000 to 5,000 feet. Exits must be at least 750 feet apart to count as separate exits.

The runway at BRW has three exit taxiways (each more than 750 feet from the other two) that connect to the taxilane along the apron. There are no parallel taxiways at Barrow Airport.

4.1.4 Meteorological Conditions

Meteorological conditions such as wind, fog, and cloud ceiling influence a pilot's decision as to which runway end to choose for an approach. Thus, these conditions can have an effect on the overall capacity for the airfield by dictating the direction of takeoffs and landings. Likewise, weather conditions dictate whether aircraft operate under Visual Flight Rules (VFR) or Instrument Flight Rules (IFR). The distinction between IFR and VFR is important because, assuming all other factors equal, fewer aircraft operations can occur during IFR conditions.

Visual Meteorological Conditions (VMC) occur when visibility is at least three statute miles and the cloud ceiling is 1,000 feet or greater. During VMC, Visual Flight Rules apply. Instrument Meteorological Conditions (IMC) exist when restrictions to visibility are lower than VMC, thereby requiring instruments to provide guidance to aircraft. Thus, during IMC, Instrument Flight Rules apply.

4.1.5 Runway Capacity

The FAA Capacity Model uses the general assumptions in Table 4-1 for the purposes of computing hourly capacity and average delays. All of these assumptions are true for BRW except the presence of a full-length parallel taxiway.

Table 4-1 – FAA Capacity Model Assumptions

Assumption	Valid at BRW?
Arrivals equal departures	✓
Touch-and-go operations less than 20%	✓
Full-length parallel taxiway in place	✗
Ample runway entrance/exit taxiways	✓
Airspace is not constrained	✓
Approximately 80% of the time the airport is operated with the runway-use configuration that produces the greatest hourly capacity	✓
At least one runway is equipped with an ILS	✓

Using the model assumptions and the mix index of 20, Barrow Airport's base ASV is 230,000 operations per year (Table 4-2).

Table 4-2 – Capacity and Base Annual Service Volume for Long-Range Planning

Source: FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*

Runway Use Configuration	Mix Index	Hourly Capacity		Annual Service Volume (operations/year)
		VFR	IFR	
1. Single Runway	**0 to 20**	**98**	**59**	**230,000**
	21 to 50	74	57	195,000
	51 to 80	63	56	205,000
	81 to 120	55	53	210,000
	121 to 180	51	50	240,000

However, the FAA Capacity Model requires adjustments to the hourly capacity calculation factors in order to better model local conditions. These adjusted calculation factors (taken from Figures 3-3 and 3-43 in AC 150/5060-5) are presented in Table 4-3 below.

Table 4-3 – Hourly Capacity Calculation Factors for Runway Configuration 1 and Fleet Mix Index of 20

Factor	Hourly Capacity	
	VFR	IFR
C* (Hourly Capacity Base)	77	58
T (Touch-and-Go Factor)	1.04	1.00
E (Exit Factor)	0.94	0.79

Based on these calculation factors, BRW's capacity is approximately 75 operations per hour in VFR conditions, dropping to 46 operations per hour during IFR conditions.

Next, an adjusted Annual Service Volume (ASV_{adj}) was calculated based on FAA guidance. The ASV was determined using the formula $\mathbf{ASV=C_w \times D \times H}$, where $\mathbf{C_w}$ is the weighted capacity, **D** is the daily demand ratio, and **H** is the hourly demand ratio. Typical demand ratios depicted in AC 150/5060-5 were used in this formula, and then the weighted hourly capacity was calculated based on the methodology outlined in Chapter 3-6 of AC 150/5060-5. The resulting formula and adjusted ASV are as follows:

$$ASV_{adj} = [(75*0.7) + (46*0.3)] * 280 * 8 = \mathbf{148{,}512}$$

4.1.6 Demand-Capacity Summary

In the most demanding future scenario, the forecast operations level represents 14% of the airfield's adjusted ASV (21,383 operations under the high growth scenario; see Chapter 3, page 3-23). FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport System* (NPIAS), indicates that airfield capacity improvements should be considered when operations reach 60% of the ASV. Therefore, the demand-capacity analysis shows no need for major capacity-related airfield improvements at Barrow Airport during the next 20 years. Local opinion about delays and capacity also indicates that BRW's capacity will remain adequate beyond 2032.

4.2 Facility Requirements

In this section, we use the data collected during the inventory and aviation forecast chapters to determine:

- The condition of the existing airport facilities
- Whether the existing facilities can accommodate existing and potential users
- Whether the existing facilities do meet, or can meet, FAA airport design criteria
- What new facilities may be needed
- When these new facilities may be needed to accommodate forecast demands

Specific determinations of location and timing of future facilities are discussed in the following chapter, *Alternatives Development and Evaluation*.

Requirements for new facilities are expressed for the short-, intermediate-, and long-term planning horizons. These translate to roughly 5-, 10-, and 20-year timeframes.

Airport facilities include both airfield and landside components. Airfield facilities are those related to the arrival, departure, and ground movement of aircraft. These include:

- Runways
- Taxiways
- Navigational aids
- Airfield lighting, markings, and signage

Airside facility needs at BRW were determined by comparing existing facilities with those needed to meet applicable FAA standards and requirements, as well as through discussions with ADOT&PF, airport tenants, and the Barrow aviation community.

Landside facilities, which provide the interface between air and ground transportation modes, include:

- Passenger terminal
- General aviation facilities
- Air cargo facilities
- Support facilities
- Ground access, circulation, and parking

Landside facility requirements were based on existing landside facilities, current and planned utilization of those facilities, and projected aviation demand.

4.2.1 Design Aircraft

Selection of appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft that are currently using or are expected to use the airport. Planning for future aircraft use is of particular importance, since design standards are used to plan airfield dimensions and separation distances between facilities. These standards must be determined now, because relocating these facilities later will likely be extremely expensive.

FAA has established a coding system to relate airport design criteria to the operational and physical characteristics of aircraft expected to use the airport. This code, called the airport reference code (ARC), has two components. The first, depicted by a letter, is the aircraft approach speed (operational characteristic, based on an aircraft's stall speed at maximum certificated weight); the second, depicted by a Roman numeral, is the airplane design group wingspan (physical characteristic, determined by the aircraft's wingspan). Generally, aircraft approach speed applies to runways and runway-related facilities, while aircraft wingspan primarily affects separation distances involving taxiways, taxi lanes, and landside facilities.

The five approach categories used in airport planning are:

- **Category A:** Speed less than 91 knots
- **Category B:** Speed 91 knots or more, but less than 121 knots
- **Category C:** Speed 121 knots or more, but less than 141 knots
- **Category D:** Speed 141 knots or more, but less than 166 knots
- **Category E:** Speed greater than 166 knots

The six airplane design groups used in airport planning are:

- **Group I:** Up to but not including 49 feet
- **Group II:** 49 feet up to but not including 79 feet
- **Group III:** 79 feet up to but not including 118 feet
- **Group IV:** 118 feet up to but not including 171 feet
- **Group V:** 171 feet up to but not including 214 feet
- **Group VI:** 214 feet or greater

The FAA recommends designing runways and taxiways to meet the requirements of the most demanding ARC that meets FAA's "substantial use" threshold of at least 500 annual operations at that airport (AC 150/5325-4B). Barrow Airport currently accommodates a wide variety of aircraft, including small single and multi-engine aircraft (approach categories A and B and airplane design group I) and business turboprop and jet aircraft (approach categories B, C, and D and airplane design groups I, II, and III).

The current ARC assigned to BRW is C-III, and this is projected to apply through the near-term. The transition to the Boeing 737-800 as the design aircraft will require designation as D-III.

Currently, the most demanding aircraft with over 500 operations at BRW is the Boeing 737-700. However, Alaska Airlines plans to begin phasing in the 737-800 over the longer term (Shaw, 2013). Thus, for the near term the 737-700 will be the most demanding aircraft and is selected as the design aircraft, and the 737-800 is the design aircraft for the long term.

4.2.2 Airside

Runways

The runway lengths recommended for Barrow Airport are based on the length required by the most critical aircraft making "substantial use" (i.e., over 500 annual operations) of the airport's runways.

The critical aircraft for the existing runways is based on the Alaska Airlines current and projected fleet. Runway length requirements were evaluated for all Alaska Airlines passenger and cargo jets presently flying into Barrow—the B737-400, B737-700, and B737-800 —first to determine which aircraft would be the most demanding, and second to compare length requirements of other potential critical aircraft if their use increases to 500 annual operations. In the near term, the critical aircraft is the Boeing 737-700, whose recommended runway length is 6,200 feet. When the 737-800 replaces the 737-700 and reaches the substantial use threshold, the recommended runway length will increase to 6,700 feet. Achieving these lengths at BRW poses a challenge which will be considered in the alternatives section of this master plan.

Methodology for Determining Recommended Runway Length

Following the method for determining runway length outlined in FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, the required runway length for an aircraft is the longer of the distances required for takeoff and for landing (see Appendix B). There is currently a draft version of AC 150/5325-4C in review. This draft AC does not change the runway length requirements for BRW.

For Barrow, where the design aircraft are the Boeing 737-700 (near term) and 737-800 (long term), the minimum runway length was determined using Boeing's Airport Planning Manuals (APM) for 737 aircraft in conjunction with AC 150/3525-4B.

According to the AC, the design inputs for determining the runway length are:

- Critical design airplanes under evaluation and their manufacturer's APM
- Maximum certificated takeoff weight or takeoff operating weight for short-haul routes
- Maximum certificated landing weight
- Airport elevation above mean sea level
- Effective runway gradient
- The mean daily maximum temperature of the hottest month at the airport

Using these inputs, both the takeoff and landing length requirements can be determined for each aircraft. The appendix contains relevant portions of the Boeing 737 APMs, including landing length, payload-range, and takeoff length charts.

Takeoff

Takeoff length is based on a takeoff weight corresponding to the length of haul that is flown by the planes on a substantial use basis. For Barrow, this is the distance from Anchorage to Barrow, a distance of 630 nautical miles. Maximum operating takeoff weight is determined from the Payload-Range Chart and appropriate haul length. Takeoff length is determined from the takeoff length chart and operating takeoff weight and then increased by 10 feet per foot of elevation difference between the high and low points of the runway.

Landing

The landing length requirement is calculated using the APM landing length chart for the highest landing flap setting on a dry runway. This landing length is then increased by 15% to account for wet runways. The APM landing length charts for the Boeing Aircraft include wet runway conditions, allowing the wet landing length to be obtained directly.

In response to the FAA SAFO (see sidebar), the FAA established a Takeoff and Landing Performance Assessment (TALPA) Aviation Rulemaking Committee to review regulations affecting certification and operation of airplanes and airports for airplane takeoff and landing operations on runways contaminated by snow, slush, ice, or standing water and provide advice and recommendations to:

- Establish airplane certification and operational requirements (including training for takeoff and landing operations on contaminated runways
- Establish landing distance assessment requirements, including minimum landing distance safety margins, to be performed at the time of arrival
- Establish standards for runway surface condition reporting and minimum surface conditions for continued operations

FAA AND INDUSTRY HELP PILOTS PLAY IT SAFE

Following the 2005 Chicago Midway Airport (MDW) accident, in August 2006 the FAA released a Safety Alert for Operators (SAFO), "*Landing Performance Assessments at Time of Arrival (Turbojets)*" (SAFO 06012), that requires operators to assess runway braking action and runway contaminants (e.g., snow, slush, and ice) prior to landing to ensure that sufficient runway length is available for a "full stop landing, with at least a 15% safety margin beyond the actual landing distance." Air carriers like Alaska Airlines have developed runway length requirements for various aircraft in their fleets to enable them to comply with these new requirements.

Comparison of Takeoff and Landing Lengths

Using the Boeing APM charts, Table 4-4 shows the preliminary runway lengths calculated for each of the Boeing 737 jet aircraft in use at Barrow.

Table 4-4 – Barrow Airport Runway Length at Maximum Landing Weight

Aircraft	Wet Landing Length	Takeoff Length[1]	Required Runway Length (APM charts)
B737-200	5,300'	5,300'	5,300'
B737-300	5,300'	5,700'	5,700'
B737-400	5,800'	6,300'	6,300'
B737-700[2]	**5,700'**	**6,200'**	**6,200'**
B737-800[3]	**6,700'**	**6,000'**	**6,700'**

The operators of the Boeing 737s into Barrow were also contacted for their assessment of the current runway length and the optimal runway length for their operations over the next 20 years. Northern Air Cargo is currently using the 737-200 and 737-300 aircraft for cargo operations, but neither exceeds the substantial use threshold of 500 annual operations. Alaska Airlines' Manager of Air Traffic and Airfield Operations described operations and procedures for a "contaminated runway."[4] Alaska Airlines' Director of Flight Operations Engineering provided landing length requirements using degraded braking action data.

Degraded braking action is determined in part by the runway surface condition report. "Medium" includes the following conditions:

- Slippery when wet—used to indicate excess rubber deposits in touchdown zones
- Wet snow or dry snow greater than 1/8 inch
- Compacted snow with outside air temperature warmer than -15°C
- Dry or wet snow over compacted snow

Table 4-5 – Runway Landing Length for Degraded Braking Action[5]— Alaska Airlines Operations based on ARC[6]

Aircraft	Good/Medium	Medium	Medium/Poor	Poor
B737-400	5,200'	5,900'	6,600'	7,500'
B737-700	5,400'	**6,200'**	7,000'	8,100'
B737-800	5,700'	**6,600'**	7,500'	8,700'

Ice results in "Poor" braking action, and wet ice is "Nil," but both can be upgraded to "Medium" if the braking action report indicates a mu value of 40 or greater.

[1] Determined using the Boeing APM charts, plus an additional 100 feet per the AC 150/5325-4B due to 10 feet of elevation difference between runway ends; see also page 89 of Technical Appendix
[2] B737-700 is the design aircraft for 0- to 5-year planning period
[3] B737-800 is the design aircraft for the 6- to 20-year planning period
[4] Defined in SAFO 06012 as a runway surface on which any substance such as snow, slush, ice, sand, or standing water is present (see Technical Appendix for complete SAFO)
[5] Basis: Flaps 40, airport elevation 100' MSL, OAT 5°C, 0.5% downward slope, maximum landing weight
[6] Aviation Rulemaking Committee

Recommendations

For Barrow Airport, the minimum runway length determined using the manufacturer's APMs forms the basis of the runway length recommendations. This will provide a runway that meets or exceeds the contaminated runway length requirements for medium braking action for the critical aircraft.

Using the medium/poor braking action requirements adds to the required runway length; it is not recommended unless constructing a longer runway is shown to be more cost-effective than implementing operational measures to enable aircraft to operate safely on a shorter runway. Such measures typically include improving braking action by application of heated sand, snow plowing, and other surface preparation methods or limiting payloads so that aircraft can safely take off on the length of runway available.

The runway lengths recommended for Barrow Airport are summarized in Table 4-6 below.

Table 4-6 – Barrow Airport Recommended Runway Lengths

Phasing	Design Aircraft	APM Length[7]	ARC Length
0-5 Years	B737-700	6,200'	6,200'
6-10 Years	B737-800	6,700'	6,600'
11-20 Years	B737-800	6,700'	6,600'

Runway Standards and Deficiencies

The appropriate design standards by ARC are specified in FAA AC 150/5300-13A, Airport Design. Table 4-7 outlines the key dimensional standards for Barrow. Airside facility needs are based upon comparing the FAA standards with the existing conditions at Barrow; Table 4-8 summarizes this comparison and documents the runway deficiencies (or needs).

Table 4-7 – Runway Standards

Runway Element	(C-III / D-IV)
Width	150'
Shoulder Width	25'
Blast Pad Width	200'
Blast Pad Length	200'
Safety Area Width	500'
Safety Area Length: Prior to Landing Threshold / Beyond Runway End	600' / 1,000'
Object Free Area Width	800'
Object Free Area Length Beyond Runway End	1,000'

[7] Runway lengths recommended by this study

Table 4-8 lists four measurements of runway length: the Takeoff Distance Available (TODA), Takeoff Run Available (TORA), Accelerate-Stop Distance Available (ASDA), and Landing Distance Available (LDA). Of these, the LDA is the critical distance for Barrow. The reason that these distances are different is because the runway at BRW has displaced thresholds. The displaced thresholds are in place because they allow the airport to meet the required amount of safety area at each end of the runway. During takeoff, an airplane is allowed to use the safety area as part of its takeoff run, thus allowing the pilot access to a "longer" runway.

Table 4-8 – Runway Characteristics

Runway Element (R/W 7/25)	Existing	737-700 Need	737-800 Need	Deficiency (737-700/737-800)
Width	150'	150'	150'	--/--
Length (TODA/TORA/ASDA/LDA)	7,100'/7,100'/6,500'/5,900'	6,200'	6,700'	LDA: 300'/800'
Safety Area Width	500'	500'	500'	--/--
Safety Area Length with Displaced Thresholds	1,000'/800'	1,000'	1,000'	200'/200'
Object Free Area (OFA) Width	800'	800'	800'	--/--
OFA Length Beyond Runway End	1,000'	1,000'	1,000'	--/--

Taxiways

Taxiways provide for safe and efficient aircraft movement between runways and aprons. As air traffic increases, the taxiway system can become the limiting operational factor. By reducing runway occupancy time, efficient location of exit taxiways can increase runway capacity. A parallel taxiway allows aircraft to taxi to the end of the runway for takeoff without crossing or taxiing down the active runway. Separation standards for runways and parallel taxiways are designed to protect various airport imaginary surfaces and instrument approach operations.

Taxiway Design Group

The design aircraft for Barrow are the Boeing 737-700 (near-term) and the Boeing 737-800 (mid-term and beyond). The Taxiway Design Group (TDG) for both aircraft is TDG 3. The TDG specifies different criteria than the Aircraft Design Group. BRW's existing taxiways meet the design aircraft TDG 3 criteria from AC 150/5300-13A with one exception – Taxiway B enters the runway within the middle third of the runway.

Parallel Taxiways

Under the requirements for a precision instrument approach, Barrow Airport should have a full-length parallel taxiway, which it does not. Per Table 3-4 of the AC, a parallel taxiway at BRW should be offset from the runway centerline by at least 400 feet.

Taxiway Geometry

AC 150/5300-13A has new recommendations for taxiway intersection geometry, which include:

- Avoid "high energy" intersections. These are intersections in the middle third of the runway, an area where a pilot can least maneuver to avoid a collision.
- Design turns should be 90 degrees whenever possible. For intersections, standard angles of 30, 45, 60, 90, 120, 135, or 150 degrees are preferred.
- Limit runway crossings.
- Do not design taxiways that lead directly from an apron to a runway.

Table 4-5 of the AC outlines the dimensional requirements of TDG 3 taxiway geometry. This table and other relevant portions of the AC are annotated and included in the Appendix of this report. Existing conditions and any deficiencies of the Barrow airport taxiways are summarized in Table 4-9.

Table 4-9 – Taxiway Characteristics and Standards

Taxiway Element	Existing	Standard (TDG 3)	Deficiency
Taxiway A			
Width	75'	50'	—
Safety Area Width	171'	79'	—
Object Free Area Width	259'	186'	—
Wing Tip Clearance	44'	34'	—
Located on Outer Thirds of Runway	Yes	Yes	—
Taxiway B			
Width	75'	50'	—
Safety Area Width	171'	79'	—
Object Free Area Width	259'	186'	—
Wing Tip Clearance	44'	34'	—
Located on Outer Thirds of Runway	No	Yes	"high energy area"[8]
Taxiway C			
Width	75'	50'	—
Safety Area Width	171'	79'	—
Object Free Area Width	259'	186'	—
Wing Tip Clearance	44'	34'	—
Located on Outer Thirds of Runway	Yes	Yes	—
Taxilane			
Width	75'	50'	–
Wing Tip Clearance[9]	27'	23'	see footnote
Taxilane Centerline to Runway Centerline	510'	400'	–
Taxilane Centerline to Fixed or Movable Object	120'	81'	—
Object Free Area Width	225'	162'	–
Parallel Taxiway			
Width	N/A	50'	50'
Taxiway Centerline to Runway Centerline	N/A	400'	400'
Taxiway Centerline to Fixed or Movable Object	N/A	93'	93'

[8] The FAA defines the middle third of the runway as a "high energy area" because it is the portion of the runway where a pilot can least maneuver to avoid a collision during landing or takeoff

[9] While the apron is wide enough to provide adequate wingtip clearance, the location of the Alaska Airlines hardstand reduces wingtip clearances in that section of the apron to sub-standard conditions

Pavement

The ADOT&PF Statewide Materials section last inspected the BRW pavement in July 2012. The results of that inspection indicate that two-thirds of the runway needs rehabilitation and the apron needs corrective maintenance. ADOT&PF evaluated the pavement condition at BRW during the summer of 2013 and will make recommendations for any corrective maintenance, rehabilitation, or reconstruction needed.

Navigational Aids

The navigational aids at Barrow Airport include an Instrument Landing System (ILS) that supports a Category I instrument approach for Runway 7. The ILS includes a localizer, glide slope equipment, and distance measuring equipment (see Chapter 2, pages 2-18 and 2-21). The ILS is adequate to support precision instrument approaches at Barrow. An Air Traffic Control Tower would be required to support a Category II instrument approach.

Visual approach navaids at BRW include high-intensity runway lighting, four-light precision approach path indicators (PAPI) on both runway ends, and runway end identifier lights (REIL) on Runway 25. These navaids are adequate to support visual approaches at Barrow.

Airfield Lighting, Marking, and Signage

Airfield lights, markings, and signs were recently installed or upgraded as part of the runway paving project, and meet FAA standards.

4.2.3 Landside

Since the master plan update in 2000, changes have occurred in the aviation industry and at the Barrow Airport. The terrorist attacks on September 11, 2001, changed the security requirements and procedures for terminal facilities, including passenger screening, baggage handling, and airport access controls.

Apron Requirements

Air carrier and air taxi gates and apron space requirements were assessed based on FAA AC 150/5360-9, FAA AC 150/5360-13, and FAA AC 150/5300-13A, and through discussions with airport tenants.

Apron space at BRW is summarized in Table 4-10. Overall, BRW has adequate apron space throughout the planning period. However, localized areas receive heavy usage, leading to congestion in these areas and underutilization elsewhere. Cargo staging and vehicular traffic on the apron, along with the proximity of the major support buildings to the apron and to each other, all contribute to the congestion. Additionally, the location of the Alaska Airlines hardstand is such that the wingtip clearances between parked 737 aircraft and taxiing 737 aircraft do not meet requirements.

Table 4-10 – BRW Apron Area

Airport Area	Square Yards (approximate)
GA Tie-Downs	5,600
Transient Tie-Downs	2,400
Block 700	22,000
Block 100	19,000
Block 300	15,500
Search & Rescue	10,000
Total Apron Area	**74,500**

Alaska Airlines is the only Part 121[10] operator at Barrow. FAA guidance recommends two aircraft parking positions for Part 121 carriers. Alaska Airlines has only one hardstand at BRW, which they are upgrading in August 2013. As Alaska Airlines has no plans to fly more than one jet to BRW at a time, this single hardstand should be sufficient for the planning period.

All air taxis and cargo carriers currently serving BRW operate from the Era Alaska facilities on Block 100, Lot 7A, where there is approximately 4,300 SY of apron space. This apron can become congested during peak periods, particularly when the larger cargo aircraft, such as Everts' DC-9 and NAC's 737-200, are being unloaded.

Based on discussions with FSS staff, the largest transient aircraft are DHC Twin Otters, which have a wingspan of 65 feet. There can be as many as three transient Twin Otters at BRW during the summer. Based on Appendix 5 in AC 150/5300-13A, aircraft with dimensions similar to the Twin Otter require approximately 520 SY of apron space. The paved transient apron by the Flight Service Station is approximately 2,400 SY, with tie-downs for four aircraft. Transient aircraft can also park in the 5,600 SY GA tie-down area. Thus, the apron space available for transient fixed-wing aircraft is adequate through the planning period.

The two BRW-based helicopters operate from the Borough's SAR hangar. The 10,000 SY of apron space is adequate through the planning period.

As many as six helicopters operate at BRW seasonally. One operates from Block 700, Lot 2, which has ample apron space. In recent years, three helicopters have operated from Block 100, Lot 4A. Based on guidance of 300 SY of apron space per helicopter, they should require 900 SY of apron space. Two USCG helicopters operated from Block 100, Lot 2A. The amount of apron space for these operations is adequate through the planning period. However, the seasonal helicopter operations at BRW are intermingled with fixed-wing operations, which is undesirable.

With only two based GA aircraft and forecast addition of one more GA aircraft during the planning period, the current apron area will remain sufficient for these aircraft.

During Summer 2012, a 737-400 operated by Miami Air carried offshore oil workers to BRW. Miami Air requested permission to park the aircraft on the apron while personnel were shuttled between the airport and the offshore oil platforms. ADOT&PF denied this request due to inadequate wingtip clearances between the parked Miami Air 737-400 and taxiing Alaska Airlines 737-400 and 737-700 aircraft. The Miami Air jet was then required to fly to Anchorage and wait for the offshore personnel to assemble at the Barrow Shell terminal before returning to pick them up.

As noted in Chapter 2, several airport tenants have indicated that the apron has dips and swales that need to be corrected.

Passenger Terminal Building

Passenger terminal functions at Barrow Airport are decentralized, with each lessee operating out of a separate facility. The two primary terminal buildings are operated by Alaska Airlines and Era Alaska. During the summer of 2012, Royal Dutch Shell utilized the facilities on Block 300, Lot 4, for passenger screening and holding.

[10] FAR Part 121 applies to scheduled passenger flights with over 30 passenger seats

Public comments indicated a desire for larger passenger terminal facilities to accommodate passenger holding, security screening, and baggage handling. Alaska Administrative Code (AAC) Title 17 does not dictate passenger terminal requirements; thus, it is up to each tenant to develop a facility that accommodates passenger demand. Alaska Airlines' Corporate Real Estate manager indicated that they are considering a remodel of their Barrow terminal facility to allow more room for passenger handling and screening.

The Building Restriction Line (BRL) limits how far south tenants can construct buildings on lease lots north of the runway. At present, the BRL is 960 feet from the runway centerline. There were comments on the placement of the BRL during the investigation phase of the master plan. The Primary Surface and Transitional Surface from Part 77 are the most restrictive on the BRL. The BRL must be at least 745 feet from the runway centerline.

Cargo

Cargo operations are currently conducted within each carrier's respective facility. The primary cargo carriers are Alaska Airlines, Northern Air Cargo, Hageland Aviation, and Everts Air. As discussed in Chapter 2, Hageland, NAC, and Everts share cargo facilities. There is approximately 10,000 square feet of enclosed cargo processing facilities in use at BRW today between the cargo carriers (Table 4-11).

Preliminary sizing of BRW cargo facilities was calculated using the Total Area Ration (TAR) method developed by the International Air Transport Association (IATA). The TAR method is a rule-of-thumb based on industry standards utilizing a ratio factor of 1.1 square feet of building space per ton of cargo per year. Based on forecast cargo volumes, Barrow Airport is going to need over 20,000 square feet of cargo facilities by the end of the planning period.

Table 4-11 – Space Requirements for Cargo Processing

		Need		
	Existing	Short-Term	Intermediate	Long-Term
Building Space[11] (sf)	10,000	15,900	17,300	20,400

Aircraft Hangars

All hangars at BRW are owned and operated by lessees and sub-lessees.

The State of Alaska Department of Military and Veterans Affairs (DMVA) indicated that they would like to develop a hangar and associated support facilities at Barrow Airport. The USCG, Alaska Air Guard, and Army National Guard have all expressed an interest in developing facilities at BRW. In the past, these entities have subleased facilities seasonally; however, there are no facilities in Barrow that meet their long-term needs. To accommodate their aircraft, they need a hangar facility large enough to house two HH-60 helicopters and one HC-130 aircraft. Additionally, the DMVA needs 10,000 square feet for response equipment storage and 5,000 square feet of vehicle storage. Overall, the facility would require 2.5 acres of land, including 45,000 square feet of apron. The facility must be within the airfield security zone per USCG requirements, and accessed through a secure man-gate. Vehicle parking should accommodate at least two vehicles outside the secure perimeter. All utilities, including electricity, gas, water, telephone, data, and sewer would be required.

[11] Estimated building space available for cargo handling

A contractor to Shell enquired about the availability of lease lots for developing helicopter hangar facilities. There were no other stakeholder comments that indicated a need for additional hangar space. However, because all existing lease lots are currently leased, future development of hangars is limited to those lessees or their sublessees.

There are no GA hangar facilities available. General aviation activity at BRW is light and not expected to increase during the planning period. Thus, no GA hangar space is recommended.

Lease Lots

There has been considerable interest in developing new lease lots at Barrow Airport in recent years (see Chapter 2, page 2-14). However, there are no developed lease lots with apron frontage. Although there are several undeveloped lots under lease, developing a gravel pad on an undeveloped lease lot will be expensive due to the limited availability of gravel and the cost of compensatory mitigation for destroying wetlands.

ADOT&PF recommends that lease lots for commercial light aircraft operations have a minimum lot area of 22,500 square feet and a minimum depth ahead of the BRL of 75 feet. Larger aircraft (20,000 to 105,000 pounds) operations should have a minimum lot area of 45,000 square feet and a minimum depth in front of the BRL of 125 feet. However, ADOT&PF is moving towards offering even larger lease lots, as experience has shown that tenants can quickly outgrow the 45,000 square feet. Therefore, ADOT&PF is recommending 90,000 square feet for airports with high aviation activity and tenants operating large commercial aircraft.

Based on the five inquiries to ADOT&PF leasing and the USCG/DMVA's interest in developing facilities, Barrow Airport should have six additional 90,000 sf lease lots for commercial or military development.

Support Facilities

ARFF/SREB

The Aircraft Rescue and Firefighting facilities at Barrow Airport are adequate for the current Index B ARFF designation. The ARFF Index is determined from the length of the largest commercial aircraft making more than five daily departures on average; Index B indicates the index aircraft is between 90 feet and 126 feet long. The Boeing 737-400 and 737-700 are both less than 126 feet long. Although the Boeing 737-800 is 129 feet long, it is not expected to reach the five or more daily departures threshold during the planning period. Therefore, the ARFF index is not anticipated to change during the planning period.

However, the ARFF/SREB facilities are located such that they cannot be expanded if the need arises—there is not enough room on the lot. As discussed below, new chemical and sand storage facilities are needed. Locating these facilities at some distance from the ARFF/SREB is not an efficient arrangement.

Airport Maintenance

Sand storage facilities at BRW are inadequate. The small area within the ARFF/SREB dedicated to sand storage is not large enough for the amount of sand required to achieve the friction needed by the design aircraft (B737-800). The quantity of sand needed to increase the runway's friction factor is directly related to the length of the runway—the longer the runway, the more sand is needed to cover it.

Based on sand storage facilities at the Bethel, Nome, and Kotzebue airports, Barrow Airport should have a facility of approximately 5,000 sf for storage of heated sand and dispensing trucks. This facility could be combined with the chemical deicing facility described below. Together, these facilities would require 50,000 square feet of apron space. However, ADOT&PF should allocate 150,000 square feet of apron space to allow relocation of the ARFF building adjacent to the new storage facilities.

Deicing

The U.S. Environmental Protection Agency (EPA) issued guidelines in May 2012 for handling aircraft and runway deicing effluent. These guidelines state that airports with over 1,000 annual jet departures need to use a non-urea-based runway deicing agent (EPA, 2012). Barrow Airport meets this criterion and therefore must switch to a non-urea-based runway deicing agent. This new deicing agent requires storage space for the chemicals and for a dedicated dispensing vehicle. ADOT&PF's ARFF/SREB does not have enough space to house these items. (ADOT&PF also does not own a vehicle capable of dispensing the new deicing chemical.) Approximately 1,200 square feet of building space is needed to house 10,000 gallons of deicing agent, associated chemical handling equipment, and the dispensing vehicle.

The EPA guidelines do not currently set any requirements for existing airports to collect or dispose of aircraft deicing agents after application. However, the trend has been towards regulations aimed at reducing pollutant loads and the adverse effects on surrounding habitat and drinking water supplies. For Barrow this is especially important as the community's drinking water supply is adjacent to the airport. It is therefore prudent to recommend that ADOT&PF consider future water quality requirements and develop a stormwater management plan.

Aircraft Maintenance

There are no aircraft maintenance shops at BRW that provide services outside their own company. Air taxis operating from Barrow have mechanics that work on their aircraft. Likewise, the NSB SAR has in-house aircraft mechanics for their fleet. Due to the very small GA presence in Barrow, a fixed base operator offering aircraft maintenance services is not likely financially feasible.

Utilities

Utilities currently serving the airport are adequate (see Chapter 2). Any development on the south side of the runway would require the extension of utilities to this area.

Airport Security and Fencing

For Part 139 certificated airports, the operator (ADOT&PF) must have an Airport Security Program. For the Barrow Airport, the security program and updates are authored by the ADOT&PF Airport Security Manager and submitted to TSA for approval.

There are three required levels of security at the Barrow Airport:

- ✈ **Air Operations Areas:** Require basic access controls meeting the 49 CFR 1542.
- ✈ **Security Identification and Display Areas (SIDA):** Require the display of badges above the waist. If anyone enters the SIDA without the badge, the persons working within the SIDA must immediately challenge them.
- ✈ **Secure Areas:** Include all the requirements of the SIDA, plus access controls.

Barrow Airport has two SIDAs, on the Alaska Airlines apron and the ERA Alaska apron. Both of these SIDAs are adequate for the planning period.

Some portions of the Barrow Airport are fenced, primarily along the north and west sides. The September 12, 2012 Certification Inspection Report indicated a need to provide fencing across the access road on the south side of the runway 7 approach end. This fencing is now in place. Fencing along the south side of the airport property is recommended.

Ground Access, Circulation, and Parking

Vehicle Parking

Three designated parking reserves on the north side of Ahkovak Street (see Figure 2-8) provide a total of approximately 40,000 square feet of parking space. Also, Alaska Airlines leases a 7,000-square-foot parking area across from their terminal; however, this lot may eventually be developed for uses other than automobile parking. There is also limited vehicle parking in front of the Alaska Airlines terminal (Block 300, Lot 3A) and the Era Alaska terminal (Block 100, Lot 7A). All parking areas at BRW are unpaved and unstriped, which results in inefficient spacing of parked vehicles. Several public comments indicated that vehicle parking is inadequate.

AC 150/5360-9 indicates that an airport with 43,000 enplanements should have approximately 75 public parking spaces. For the forecast 61,000 enplanements, the AC recommends 125 parking spaces. The AC further recommends that 15% to 25% of the total parking spaces be reserved for short-term parking, with the remainder allotted for long-term parking.

Because of the close proximity of the airport to the community, Barrow Airport does not require any long-term parking. Therefore it is reasonable to suggest that BRW requires fewer parking spaces than suggested by the AC. For short-term parking, BRW should need only 20 parking spaces now (25% of recommended 75 spaces) and 35 (25% of recommended 125 spaces) by the end of the planning period.

Based on 20'x10' parking spaces with 20-foot-wide access lanes, there is enough room for approximately 130 vehicles within the current parking areas, which satisfies current and forecast parking demand. However, while the square footage of total parking area is adequate, the locations of the parking lots are inconvenient, as the demand for parking spaces is centered on the Alaska Airlines and Era Alaska terminals.

Land Requirements

The Barrow Airport encompasses over 700 acres of ADOT&PF land. This acreage can accommodate all facilities needed through the 20-year planning period. However, access to the south side is required in order for this area to be developed.

4.2.4 Other Items of Concern

The airport manager and the FAA Lead Airport Certification Safety Inspector identified ponding water around airport property, particularly between the apron and runway, as an attractant to waterfowl. This represents a potential wildlife hazard. A wildlife hazard assessment is needed to address these conditions.

The airport manager also indicated that the Runway Safety Areas were experiencing considerable erosion from late summer rains.

4.3 Findings

Barrow Airport does not require any capacity-related improvements during the planning period. However, there are some facility improvements needed in order to support forecast growth.

Facility deficiencies include:

- Insufficient runway length to accommodate the design aircraft at its maximum landing weight
- Taxiway geometry concerns
- Lack of a building to store chemical de-icing agent and associated equipment
- Undersized sand storage facilities
- No lease lots available for development
- Existing lease lots undersized for current usage
- No dedicated military facilities
- Vehicle parking areas underutilized due to distance from terminal
- Gaps in security fencing around the airport perimeter
- No access road or lease lots on the south side of the runway
- No parallel taxiway(s)
- Insufficient cargo processing facilities
- Pavement conditions

The next chapter of the master plan will outline and evaluate potential alternative development scenarios. Primary elements of the alternatives analysis will include:

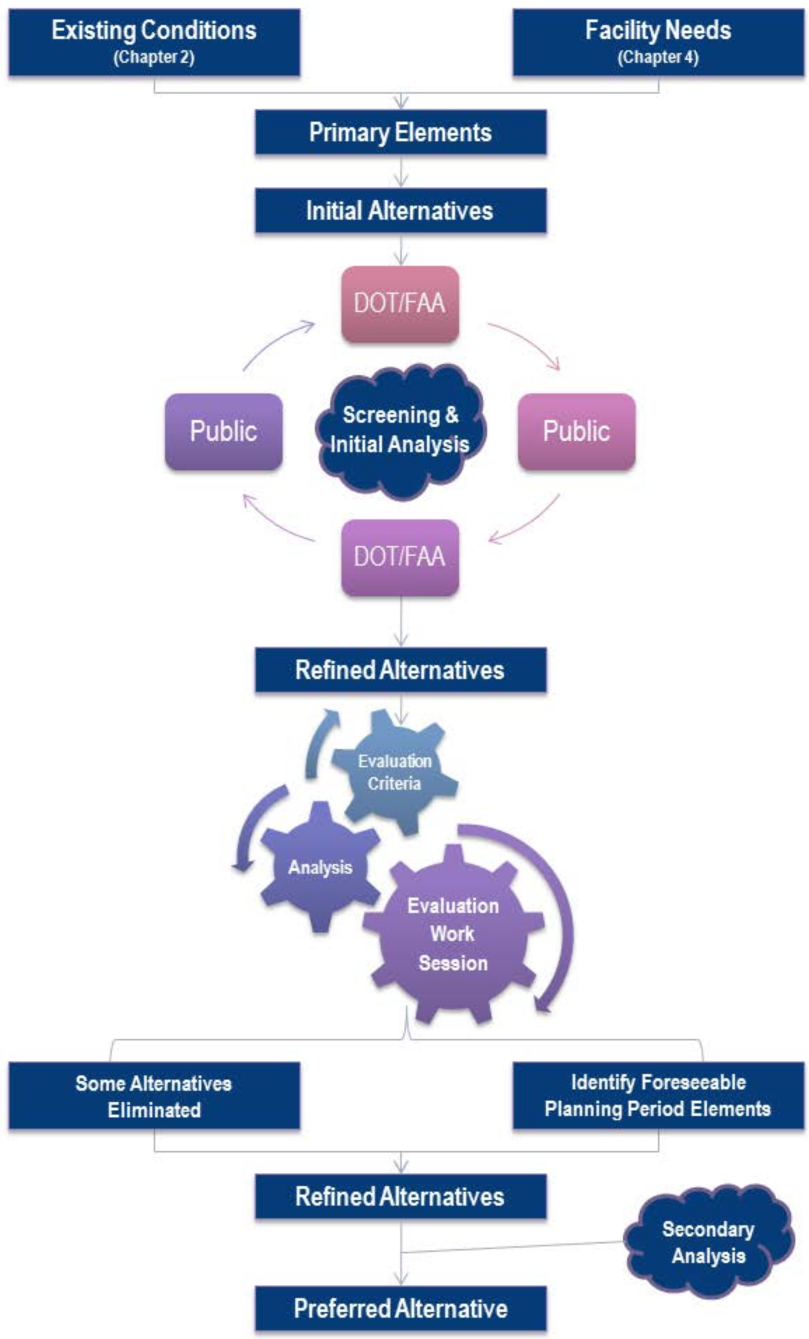
- Runway options to meet length requirements
    - Physical solutions
    - Operational solutions
- Land reserves for M&O facilities
- Additional land area with direct runway access for development

5 Alternatives

The previous chapter identified Barrow Airport's deficiencies based upon the FAA-approved forecast (Chapter 3). This chapter identifies and evaluates development alternatives for BRW that will address those deficiencies. Chapter 6 will outline the steps needed to implement these improvements.

5.1 Alternative Development Process

Developing alternative concepts for airport development is an iterative process. The project team started with primary elements that were identified during the inventory (Chapter 2) and facility requirements (Chapter 4) phases. These primary elements led to the identification of preliminary alternative concepts which were presented to the public, stakeholders, and resource agencies. Based on feedback from these groups and additional analyses, these concepts were refined. The refined concepts were then combined to form unique development alternatives. These alternatives were analyzed more thoroughly by the project team and ADOT&PF against specific evaluation criteria. This led to the elimination of some alternatives and the refinement of those remaining. Following a secondary analysis, a preferred alternative was selected.



5.2 Primary Elements

Primary elements generally require large, contiguous land areas. The primary elements for BRW and the deficiencies that they address are outlined in Table 5-1.

Table 5-1 – Primary Alternative Elements

Primary Elements	Deficiency Addressed
Airside	
Runway Length	Landing length needed by the design aircraft during "slippery" conditions
Parallel Taxiway	FAA standard
Landside	
Additional Leasing Opportunities	No existing infrastructure or designated lease areas to accommodate the demand for development
Expansion of Existing Lease Lots	Current lease lots are undersized for their use
M&O Land Reserve	Current facility undersized, with no space for expansion
Special Land Use Reserve	No developed areas of airport capable of supporting USCG/DMVA needs

5.3 Alternative Concept Descriptions

The following section describes alternative concepts that were developed to remedy current and projected airport deficiencies. The initial concepts were developed collaboratively by the consultant team and the ADOT&PF. Coordination with regulatory agencies and the public was conducted throughout the alternatives development and evaluation process. The alternative concepts were presented to the public and stakeholders at a series of meetings in Barrow on August 19, 2013. A project steering committee composed of local, state and federal agencies was also consulted in the development and evaluation of alternatives. Letters to the steering committee detailing the alternative concepts were sent on September 9, 2013. Based on these meetings and consultations, the concepts were refined and are presented in the following sections.

5.3.1 Concepts Dropped from Further Consideration

Several concepts were dropped from further consideration very early in the process. These were:

- Airport relocation
- Runway extension into Isatkoak Lagoon or the Chukchi Sea
- Crosswind runway

Airport relocation was dropped for several reasons:

- Construction costs estimated to be in excess of $600 million, well beyond the traditional funding capabilities of ADOT&PF and FAA
- Considerable environmental impacts to an undisturbed area away from the community; areas around Barrow contain numerous wetlands and are critical habitat for the endangered Steller's Eider and Spectacled Eider
- The amount of money invested in the current airport and the related FAA grant assurances

Extending the runway on either end was dropped because of the environmental impacts associated with construction in the community's water supply (Isatkoak Lagoon), the engineering challenges of construction into the lagoon and the ocean, and the possibility of blocking vehicle access to the south.

A crosswind runway was dropped from consideration for three primary reasons:

- No reports from either stakeholders or the local aviation community that a crosswind runway was needed
- The costs associated with construction of a new runway and additional land acquisition
- The current runway alignment has over 93% wind coverage for the design aircraft

5.3.2 Airside Development Concepts

Because all other airport functions relate to and revolve around the basic runway-taxiway layout, airside development alternatives must be carefully examined and evaluated. Specific airside considerations for Barrow Airport include taxiway layout, runway length, and impacts to instrument approach capabilities.

Runway Length

The runway length requirements (detailed in Chapter 4) are based on fully-loaded aircraft operating in "slippery" conditions. To meet the requirements of the near-term design aircraft (737-700), the runway should have an additional 300 feet of landing distance available. In the long term, the runway will require an additional 500 feet of landing distance (for a total increase of 800 feet) to accommodate the Boeing 737-800. There are four primary ways to address this deficiency:

- Physically lengthen the runway
- Install an Engineered Material Arrestor System (EMAS)
- Increase maintenance efforts (e.g., more frequent snow removal, additional sanding) to keep the runway condition code at "Medium" or higher
- Aircraft operators fly with less than maximum landing weight

Of these, physically lengthening the runway was removed from further consideration due to the environmental and engineering challenges associated with construction into the community water source on the eastern end of the runway and the Chukchi Sea on the western end.

A standard EMAS on both runway ends at BRW would allow the displaced thresholds to be shifted, thus providing 600 feet of additional landing distance without a physical extension of the runway. However, an EMAS on the western end of the runway would require moving the MALSR (Medium-Intensity Approach Lighting System with Runway Alignment Indicator) to the west, over the bluff and into the ocean. This option is not practical and therefore was removed from further consideration. A standard 600-foot EMAS installation on the eastern end of the runway would provide an additional 150 feet of landing distance. This does not meet the needs of the near-term design aircraft. However, a non-standard EMAS installation of 450 feet would provide 300 feet of additional landing distance (see Figure 5-1).

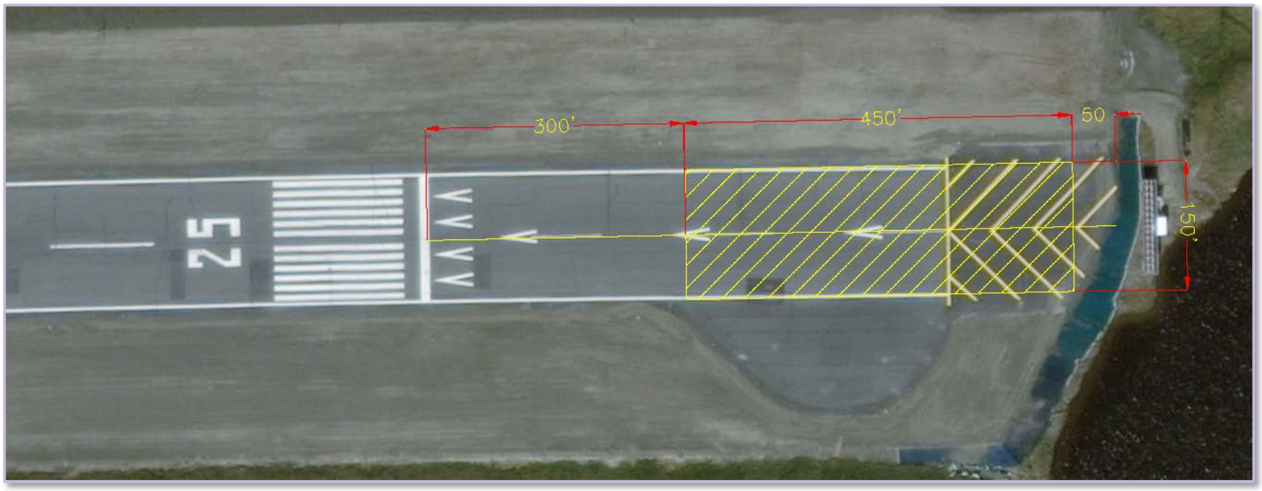


Figure 5-1 – Potential Non-Standard EMAS Installation on East End

Keeping the runway surface free of slippery substances would enable aircraft to land within their "normal" distance even in poor weather. This would require increasing maintenance efforts such as snowplowing and sanding so that the surface always rates a runway condition of "Medium" or better. (See Chapter 4, page 4-9, for discussion of landing distance needs for the design aircraft during contaminated runway conditions).

Runway length needs are based on the design aircraft landing with maximum allowable landing weight. This means that aircraft landing at less than full weight can use a shorter runway. Air carriers can choose to fly with less than maximum payload during times when the runway is slippery due to snow or ice.

Parallel Taxiway(s)

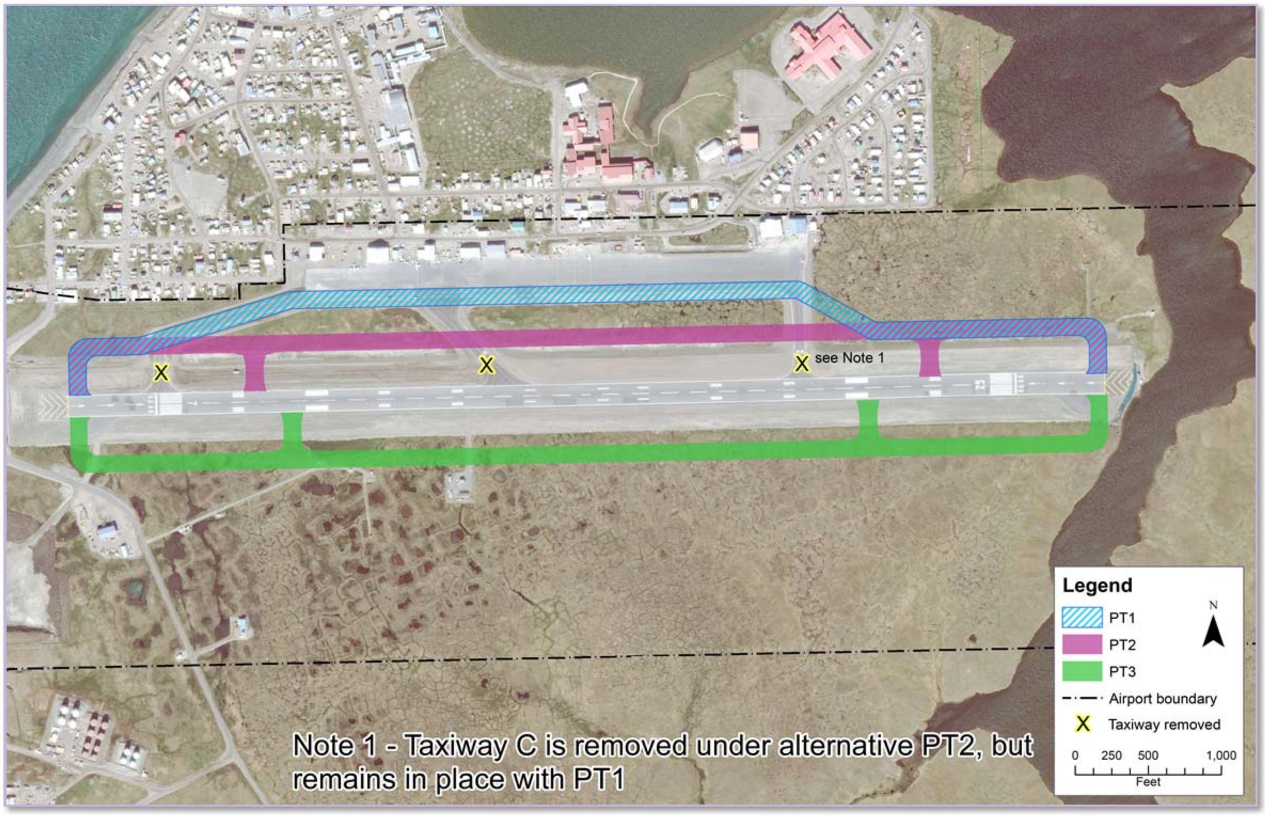


Figure 5-2 – Parallel Taxiway Alternatives

FAA AC 150/5300-13A identifies a parallel taxiway as a component of a basic airport. A parallel taxiway allows aircraft to access or depart the runway without back-taxiing on the runway. This reduces the amount of time that arriving aircraft spend on the runway before the next aircraft behind them can land. Minimizing the length of time that aircraft not in the act of departing or arriving spend on the runway allows aircraft to land with lower approach minimums in limited visibility conditions.

The FAA has indicated that any development on the south side of BRW will require a full-length parallel taxiway (Lomen, 2012); otherwise, the approach minimums will be raised. Raising the approach minimums is undesirable, as this will lead to more flight cancellations and delays due to the weather. However, FAA has indicated that an exemption to the full-length parallel taxiway requirement could possibly be granted if the only south side development is for ADOT&PF M&O and the USCG/DMVA (Oien, 2013).

PT1 – North Side Parallel Taxiway Option 1

This alternative proposes a full-length parallel taxiway on the north side of the runway. This concept utilizes the existing apron and Taxiway C to the extent possible. A portion of Taxiway A is relocated, Taxiway B is removed, and a new taxiway is constructed on the east end.

PT2 – North Side Parallel Taxiway Option 2

This alternative proposes a full-length parallel taxiway on the north side of the runway, offset from the runway centerline by 400 feet. Existing Taxiways A, B, and C would be relocated, and a new entrance taxiway (D) would be constructed.

PT3 – South Side Parallel Taxiway

This alternative proposes a full-length parallel taxiway on the south side of the runway, offset 400 feet from the runway centerline. Four new taxiways would connect the parallel taxiway to the runway.

5.3.3 Landside Development Concepts

In general, landside facilities consist of terminal area development, aircraft parking aprons, support facilities (e.g., utilities), hangar development areas, and airport access. The overall objective of landside development planning at Barrow Airport is to provide facilities which are conveniently located and accessible to the community and which accommodate the specific requirements of airport users.

Lease Lots

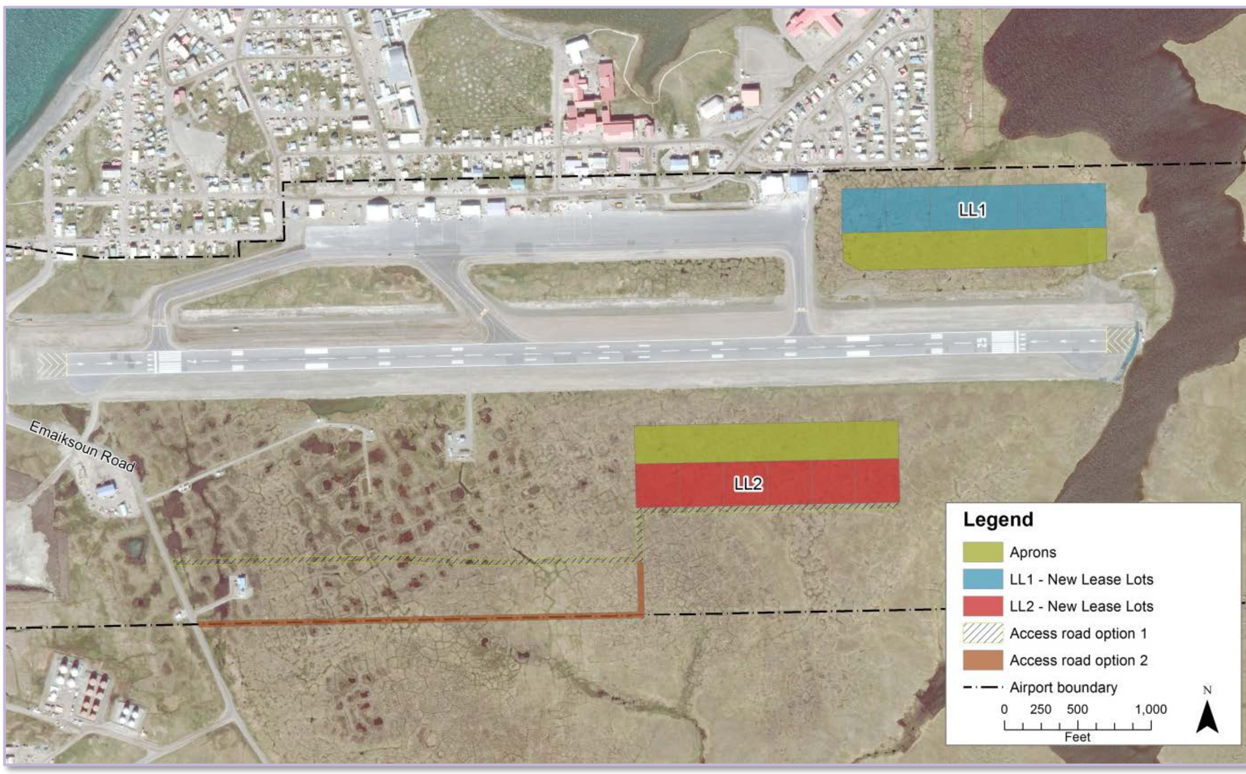


Figure 5-3 – Alternatives for Creating New Lease Lots

Demand for lease lots at BRW is high. The previous chapter identified the need to add six new commercial-sized (300’x300’) lease lots and to enlarge the existing lease lots.

LL1 – New Lease Lots in Northeast Corner

Six new 90,000 sf lease lots would be established on 12.5 acres of land in the northeast corner of the airport property, adjacent to Parcel AD. A 460,000 sf apron would be constructed adjacent to and south of the lease lots.

Vehicle access would be from existing roads.

LL2 – New Lease Lots on South Side

Six new 90,000 sf lease lots would be established on 12.5 acres of land south of the runway. A 480,000 sf apron would be constructed on the north side of the lease lots.

Vehicle access to the new lease lots would be via one of two access road options:

- Option 1 is a new 1-mile road from Emaiksoun Road east to the new lease lots. It would lie completely within the airport property boundary.
- Option 2 is a new 0.6-mile road from Emaiksoun Road to the new lots. This road would run along the airport boundary.

LL3 – Ahkovak Street Realignment

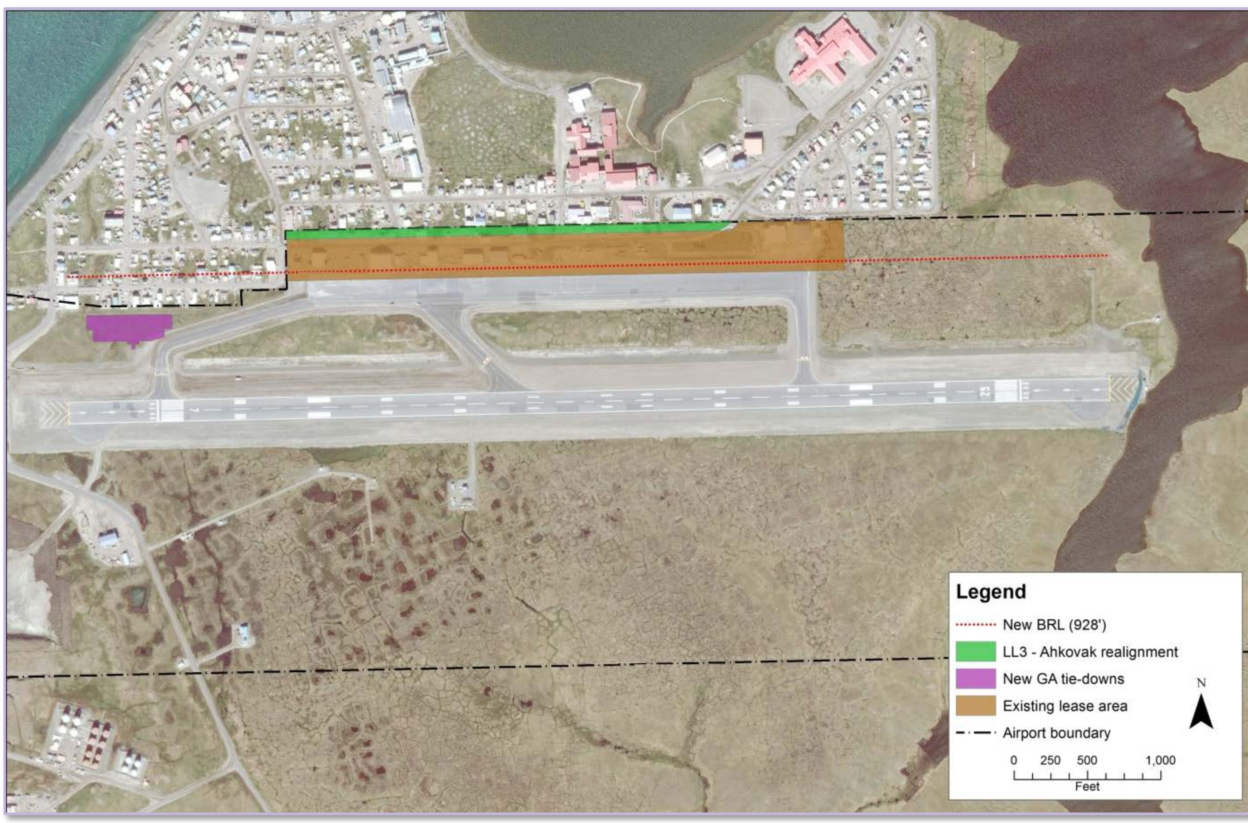


Figure 5-4 – Existing Lease Lot Expansion Alternative – Ahkovak Street Realignment

LL3 would shift Ahkovak Street to the north edge of the airport property boundary to make room for northward expansion of the existing lease lots with apron frontage (Blocks 100, 300, and 700). The Building Restriction Line (BRL) would also be shifted 32 feet south, giving the tenants more flexibility for development on their lots.

The GA tie-down area would be relocated to west of Taxiway A, making room to establish a new lease lot between Block 300, Lot 5, and Block 700, Lot 1.

With LL3, the existing lease lots within Blocks 200, 400, and 600 will be lost to the realigned roadway. The current tenants (who are using these lots for non-aeronautical purposes) would need to relocate their facilities.

LL4 – BRL Shift South

Figure 5-5 – Existing Lease Lot Expansion Alternative – Apron Expansion and BRL Shift

During the recent runway reconstruction project, the runway centerline was moved 210 feet to the south, but the BRL was never adjusted to follow it. LL4 would shift the BRL 160 feet southward and extend the boundaries of the existing lease lots to 50 feet south of the new BRL. The apron would also be expanded 160 feet southward, adding 665,000 sf of apron space.

The GA tie-down area would be relocated to the western edge of the apron, adjacent to the transient tie-downs in front of the FSS. This makes it possible to establish a new lease lot between Block 300, Lot 5, and Block 700, Lot 1.

M&O Land Reserve

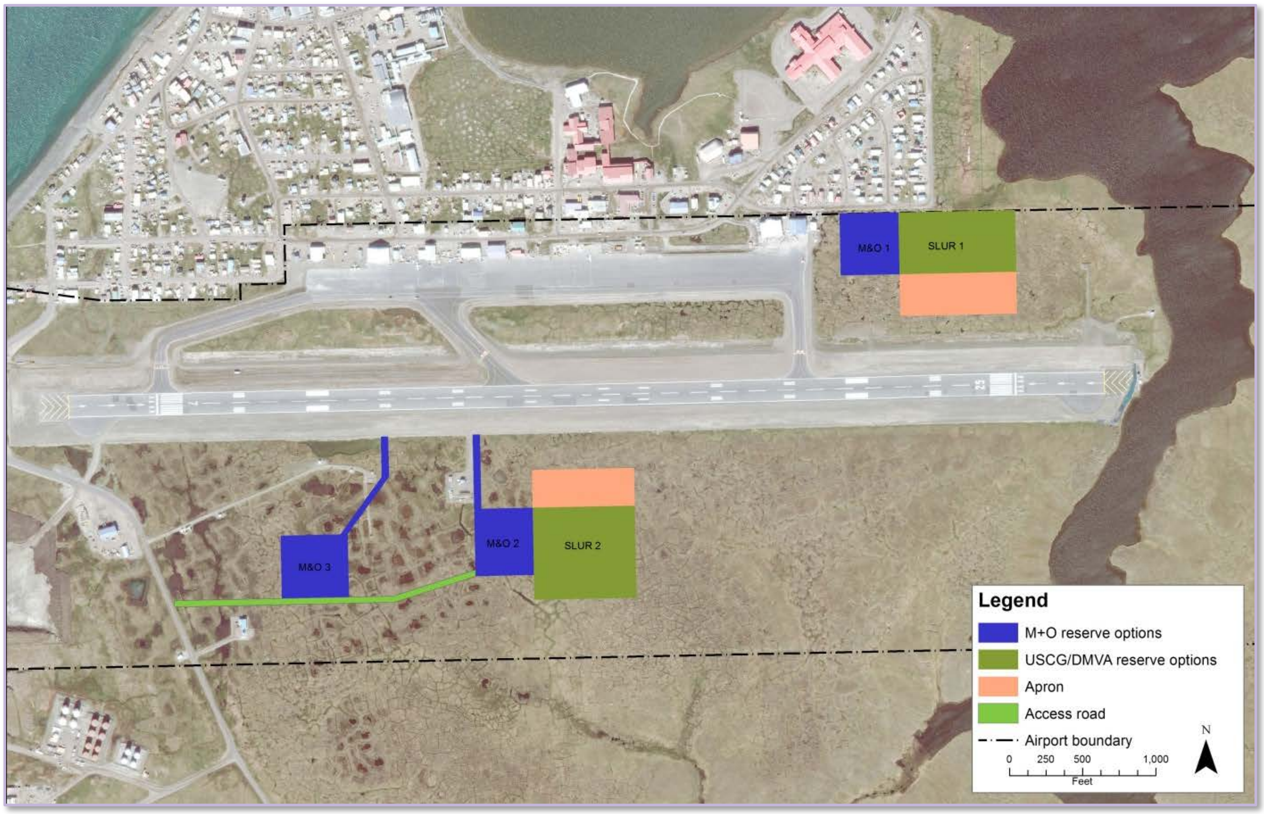


Figure 5-6 – M&O and Special Land Use Reserve Alternatives

There is an immediate need to develop storage facilities for deicing chemicals and traction sand, as well as the equipment used to mix and apply them. However, the existing site of the ARFF/SREB is not large enough to accommodate these new facilities. When selecting a site for new facilities, the ultimate consolidation of ADOT&PF M&O facilities should be considered. A land reserve of 184,000 sf would allow colocation of the chemical storage, sand storage, ARFF, and SREB functions.

Three potential locations for the M&O land reserve are shown in Figure 5-6 and described below. These locations were identified by ADOT&PF based on several criteria, including emergency vehicle response time and equipment access to apron areas.

M&O1 – Northeast Corner

The M&O reserve would be in the northeast corner of the airport, on Parcel E. Access to this property and (for emergency and maintenance vehicles) to the runway is available via existing roads.

M&O2 – South Side

The M&O reserve would be on the south side of the runway, east of the existing regulator building. Vehicle access to this property would be via a new road from Emaiksoun Road.

M&O3 – Southwest Corner

The M&O reserve would be on the south side of the runway, west of the existing NDB. Vehicle access to this property would be via a new road from Emaiksoun Road. A second road would provide access to the runway for emergency and maintenance vehicles.

Special Land Use Reserve

A land reserve for dedicated Department of Military and Veterans Affairs (DMVA) and United States Coast Guard (USCG) facilities was identified as a need at BRW. Based on conversations with the DMVA and the USCG, each agency would need at least 2.5 acres to accommodate the development of its desired aviation facilities.

Siting of the land reserve needs to consider:

- Separation from small aircraft operations
- Separation from residential areas

SLUR1 – Northeast Corner

SLUR1 would reserve 7.5 acres of land in the northeast portion of the airport property, east of Parcel E, and construct a new 5.5-acre apron adjacent to the land reserve.

SLUR2 – South Side

SLUR2 would reserve 7.5 acres of land on the south side of the airport, east of the existing regulator building, and construct a new 4.5-acre apron adjacent to the land reserve.

5.4 Alternatives Compilation

The alternative concepts described above were combined to form discrete alternatives that accommodate the projected aviation growth and remedy any current or projected airport deficiencies. These alternatives were analyzed in greater detail in order to compare the merits of each and identify the best long-term development plan. The no-build alternative was also used as a baseline to provide comparison between alternatives. All alternatives were developed to meet FAA AC standards and represent a level of detail that is common to a master planning effort.

5.4.1 Alternative 1

PT2	Full-Length Parallel Taxiway
LL1	New Northeast Corner Lease Lots
LL4	Apron Expansion and BRL Shift 160 Feet South, GA Tie-Down Relocation
M&O2	M&O Land Reserve on South Side
SLUR2	DMVA/USCG South Side Land Reserve

Airside Development

A full-length parallel taxiway with four connecting taxiways is built on the north side of the runway. Existing Taxiways A, B, and C are relocated.

Landside Development

This alternative includes shifting the BRL 160 feet to the south and expanding the apron 160 feet southward. Existing lease lot boundaries are also extended to the south, providing additional space for tenants. GA tie-downs are relocated to the west end of the apron, adjacent to the Flight Service Station tie-downs. Six new lease lots are designated in the northeast corner of the airport and an adjacent apron is constructed. Approximately 4 acres of land are reserved for M&O use on the south side of the runway, including an access road. A special land use reserve for the USCG/DMVA and corresponding apron is also established on the south side of the runway.

Assumptions

FAA would have to grant a waiver to the requirement of a full-length parallel taxiway on the south side.

Advantages and Disadvantages

Advantages	Disadvantages
▪ Minimal fill on south side of runway ▪ USCG/DMVA operations separate from air taxi, air carrier, and GA operations ▪ Minimal disruption to existing tenants ▪ Reduces the amount of infield area that currently attracts waterfowl ▪ Minimal expansion/extension of utilities	▪ Does not accommodate off-airport development on south side ▪ Does not move non-aeronautical uses off airport property ▪ Increased airport development near residential area ▪ Airport development near water supply

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Figure 5-7
Barrow Airport Master Plan Update
Alternative 1

Apron expansion and BRL shift 160 feet south (LL4), GA tie-down relocation, new northeast corner lease lots (LL1), full length parallel taxiway (PT2), M&O land reserve on south side (M&O2), and DMVA/USCG south side land reserve (SLUR2)

- Airport boundary
- LL4, BRL Shift (800')
- LL4, Expanded lease area
- LL1apron, 460,000 sq. ft
- SLUR2apron
- SLUR2, 7.5 acres south of airport
- PT2, Northside parallel taxiway option 2
- LL1, 12.5 acres norheast corner of airport
- M&O2, south side of runway
- M&O2, access road
- GA tie-downs
- Apron expansion
- X Removed

Data Sources:
ADOT & PF
North Slope Borough, Dept. of Planning,
imagery date: July, 2012

0 250 500 1,000 1,500 2,000
Feet

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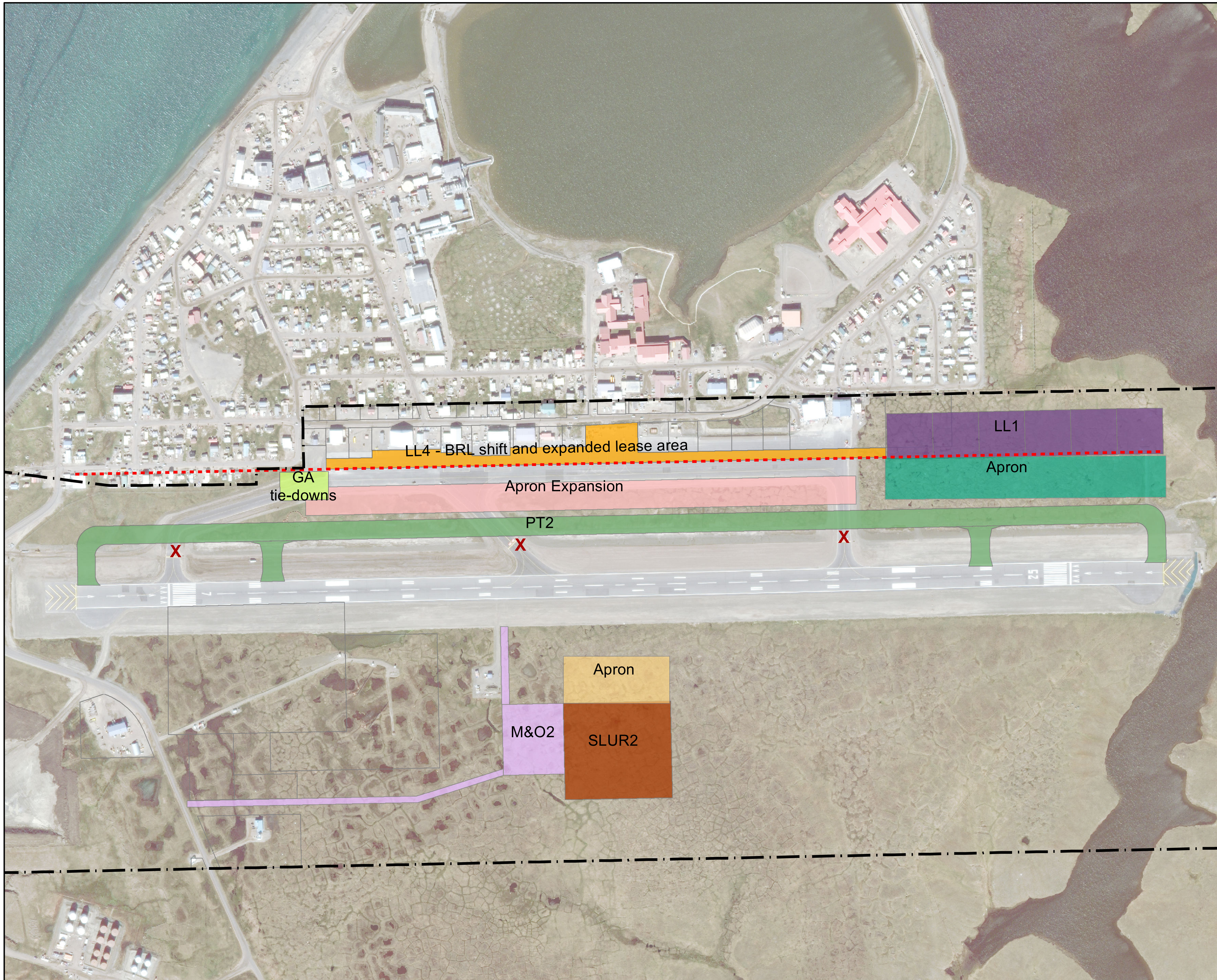
Prepared For:



5.4.2 Alternative 2

PT2 & PT3	Full-Length North and South Side Parallel Taxiways
LL2	New South Side Lease Lots and Access Road
LL4	Apron Expansion and BRL Shift 160 Feet South, GA Tie-Down Relocation
M&O1	M&O Land Reserve in Northeast Corner
SLUR1	USCG/DMVA Northeast Corner Land Reserve

Airside Development

Two full-length parallel taxiways are constructed, one on each side of the runway. Each parallel taxiway includes four connecting taxiways. Existing Taxiways A, B, and C are relocated.

Landside Development

This alternative shifts the BRL 160 feet south and expands the apron 160 feet southward. Existing lease lot boundaries are also extended to the south, providing additional space for tenants. The existing GA tie-downs are relocated to the west end of the apron, adjacent to the Flight Service Station tie-downs, thereby opening up a new lease lot. Six new lease lots are designated on the south side of the runway and a south side apron is constructed. A vehicle access road is established between Emaiksoun Road and the new south-side lease area. Two land reserves are designated in the northeast corner—an M&O reserve and an USCG/DMVA land reserve.

Advantages and Disadvantages

Advantages	Disadvantages
▪ Accommodates off-airport development to the south ▪ Minimal disruption to existing tenants ▪ Reduces the amount of infield area that currently attracts waterfowl	▪ Extensive fill on south side – wetland impacts, potential for cultural resources ▪ Requires considerable utility extensions ▪ USCG/DMVA operations close to residential area ▪ Airport development near water supply

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Figure 5-8

Barrow Airport Master Plan Update

Alternative 2

Apron expansion and BRL shift 160 feet south (LL4), GA tie-down relocation, new south side lease lots and access road (LL2), full length north and south side parallel taxiways (PT2 & PT3), M&O land reserve on northeast corner (M&O1), and DMVA/USCG northeast corner land reserve (SLUR1)

- Airport boundary
- LL4, BRL Shift (800')
- LL4, Expanded lease area
- Access road, option 1
- Access road, option 2
- LL2, 12.5 acres south of airport
- LL2 apron, 480,000 ft
- M&O1, northeast option
- SLUR1, 7.5 acres northeast of airport
- 7.5 acre apron for SLUR1
- PT2, north side parallel taxiway
- PT3, south side parallel taxiway
- Relocated GA tie-downs
- Apron expansion
- X Removed Taxiway

Data Sources:
ADOT & PF
North Slope Borough, Dept. of Planning,
imagery date: July, 2012

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Feet

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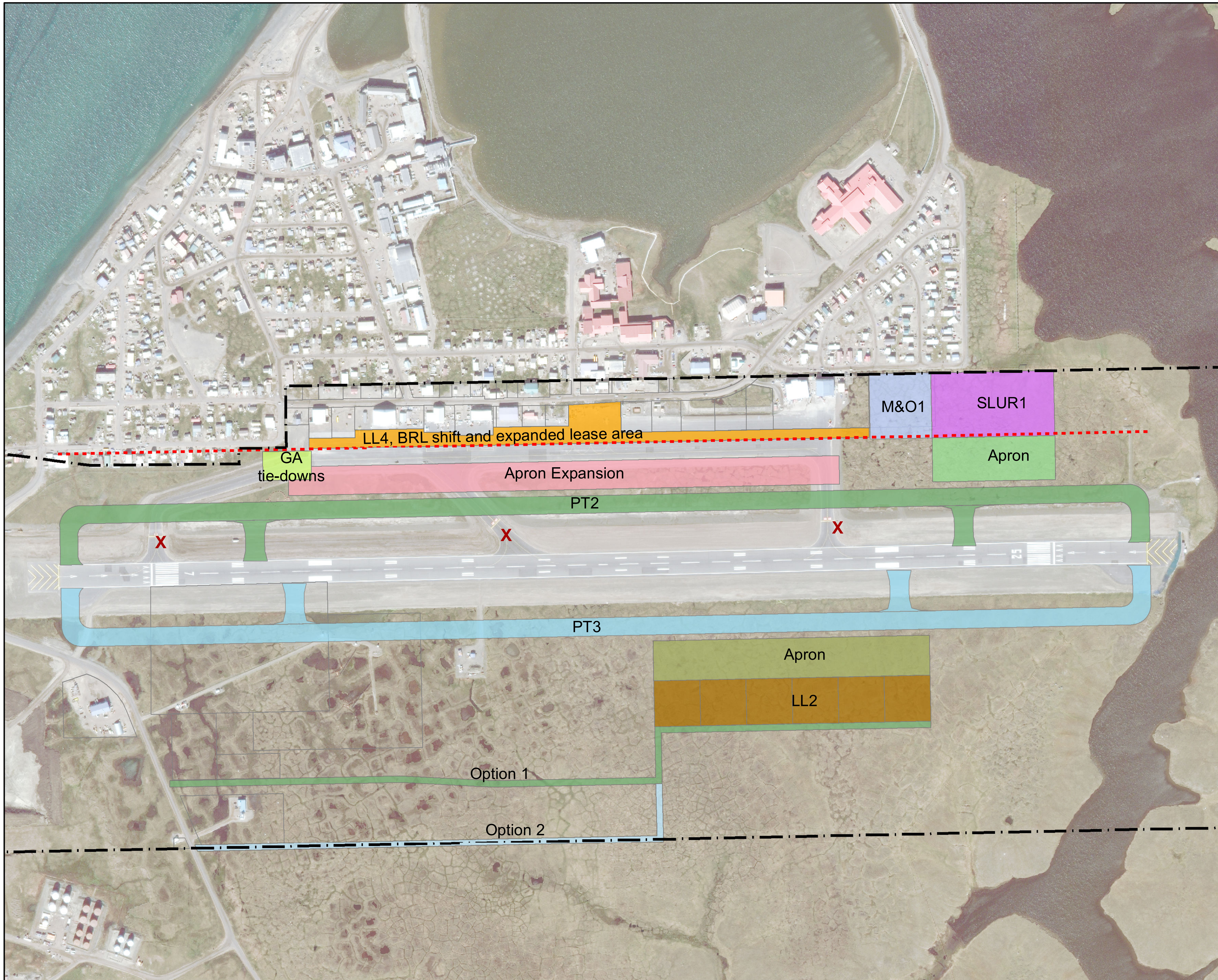
Prepared For:



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5.4.3 Alternative 3

PT2 & PT3	Full-Length North and South Side Parallel Taxiways
LL2	New South Side Lease Lots and Access Road
LL4	Apron Expansion and BRL Shift 160 Feet South, GA Tie-Down Relocation
M&O2	South Side M&O Land Reserve
SLUR2	South Side DMVA/USCG Land Reserve

Airside Development

Two full-length parallel taxiways are constructed—one on the north side and one on the south side. Existing Taxiways A, B, and C are relocated.

Landside Development

This alternative shifts the BRL 160 feet to the south and expands the apron 160 feet southward. Existing lease lot boundaries are also extended to the south, providing additional space for tenants. The existing GA tie-downs are relocated to the west end of the apron, adjacent to the Flight Service Station tie-downs, thereby opening up a new lease lot. Six new lease lots are designated on the south side of the runway and a new south side apron is constructed. Land reserves for ADOT&PF M&O and USCG/DMVA are also designated on the south side. An access road from Emaiksoun Road to the new south side development is constructed.

Advantages and Disadvantages

Advantages	Disadvantages
▪ Separation of USCG/DMVA aviation activity from residential areas ▪ Separation of new aviation activity associated with new lease lots from residential areas ▪ Minimal impact to existing lease holders ▪ Accommodates off-airport development plans to the south ▪ Reduces the amount of infield area that attracts waterfowl	▪ Requires extensive utility extensions ▪ Considerable construction in wetlands and areas with high potential for cultural resources

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Figure 5-9
Barrow Airport Master Plan Update
Alternative 3

Apron expansion and BRL shift 160 feet south (LL4), GA tie-down relocation, new south side lease lots and access road (LL2), full-length north and south side parallel taxiways (PT2 & PT3), south side M&O and DMV/USCG land reserves (M&O2 and SLUR2)

- Airport boundary
- LL4, BRL Shift (800')
- LL4, Expanded lease area
- 4.5 acre apron for SLUR2
- SLUR2, 7.5 acres south of airport
- M&O2, expanded south of runway
- access road, option 1
- access road option 2
- PT3, south side parallel taxiway
- PT2, north side parallel taxiway
- LL2, 12.5 acres south of airport
- LL2 apron, 480,000 sq. ft
- Relocated GA tie-downs
- Apron expansion
- X Removed taxiways

Data Sources:
ADOT & PF
North Slope Borough, Dept. of Planning,
imagery date: July, 2012

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Feet

N

Prepared For:

5.4.4 Alternative 4

PT1	Full-Length North Side Parallel Taxiway
LL1	New Northeast Corner Lease Lots
LL3	Ahkovak Street Realignment, Lease Lot Expansion, GA Tie-Down Relocation
M&O2	M&O Land Reserve on South Side
SLUR2	DMVA/USCG South Side Land Reserve

Airside Development

A full-length parallel taxiway is constructed on the north side of the runway, utilizing the edge of the existing apron where possible. Taxiway A is relocated and Taxiway B is removed. Taxiway C remains in place, and a new Taxiway D is constructed at the east end.

Landside Development

Ahkovak Street is realigned between Kiogak Street and the intersection of the east end of Ahkovak Street with the airport property boundary. The road is moved to the north edge of the airport property. This requires the relocation of existing lease holders in Blocks 200, 400, and 600. The remaining lease lots are expanded north to the boundary of the new Ahkovak Street right-of-way. GA tie-downs are relocated to the west end of a new parallel taxiway. The area vacated by the relocated GA tie-downs becomes a new lease lot. Six more new lease lots (300'x300' each) are designated in the northeastern corner of the airport and an adjacent apron is constructed. Two land reserves are dedicated on the south side of the runway—one for ADOT&PF M&O and one for USCG/DMVA facilities. A vehicle access road is constructed between these new land reserves and Emaiksoun Road.

Assumptions

This alternative assumes that the FAA would grant a waiver to the requirement of a full-length parallel taxiway on the south side.

Advantages and Disadvantages

Advantages	Disadvantages
▪ Makes maximum use of existing embankment ▪ Moves non-aeronautical uses off airport ▪ Separation of USCG/DMVA aviation activity from residential areas	▪ Does not accommodate off-airport development plans to the south ▪ Considerable impacts to existing lease holders ▪ Moves vehicular traffic closer to residences along Okpik Street ▪ New lease lots are adjacent to residential area ▪ Airport development near water supply

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Figure 5-10

Barrow Airport Master Plan Update

Alternative 4

Ahkovak Street realignment and lease lot expansion (LL3), GA tie-down relocation, full-length north side parallel taxiway (PT1), new northeast corner lease lots (LL1), M&O land reserve on south side (M&O2), and DMVA/USCG south side land reserve (SLUR2)

- Airport boundary
- BRL (928')
- SLUR2 apron
- LL3, Expanded lease area
- LL3, Ahkovak Realignment
- SLUR2, 7.5 acres south of airport
- M&O2, expanded south of airport
- M&O2, access road
- LL1 apron, 460,000 sq. ft
- LL1, 12.5 acres northeast of airport
- PT1, northside parallel taxiway
- Relocated GA tie-downs
- X Removed taxiways

Data Sources:
ADOT & PF
North Slope Borough, Dept. of Planning,
imagery date: July, 2012

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5.4.5 Alternative 5

PT1 & PT3	Full-Length North and South Side Parallel Taxiways
LL2	New South Side Lease Lots and Access Road
LL3	Ahkovak Street Realignment, Lease Lot Expansion, GA Tie-Down Relocation
M&O1	M&O Land Reserve in Northeast Corner
SLUR1	USCG/DMVA Northeast Corner Land Reserve

Airside Development

A full-length parallel taxiway is constructed on the north side of the runway, utilizing the edge of the existing apron where possible. Taxiway A is relocated and taxiway B is removed. Taxiway C remains in place and a new taxiway D is constructed at the east end. A full-length parallel taxiway with four connecting taxiways is also constructed on the south side of the runway.

Landside Development

Ahkovak Street is realigned between Kiogak Street and the intersection with the airport property boundary. The road is moved to the north edge of the airport property. This requires the relocation of existing lease holders in Blocks 200, 400, and 600. The remaining lease lots are expanded north to the boundary of the new Ahkovak Street right-of-way. GA tie-downs are relocated to the western end of a new parallel taxiway. The area vacated by the relocated GA tie-downs becomes a new lease lot. Six more new lease lots are designated on the south side of the runway and an adjacent apron is constructed. A vehicle access road is constructed to the new lease area from Emaiksoun Road. Two land reserves are established in the northeastern corner of the airport property—an ADOT&PF M&O reserve and a USCG/DMVA reserve.

Advantages and Disadvantages

Advantages	Disadvantages
▪ Utilizes existing embankment for north side taxiway ▪ Accommodates proposed off-airport development to the south ▪ Moves non-aeronautical uses off airport property	▪ USCG/DMVA operations close to residential area ▪ Considerable fill in wetlands and areas with high cultural resource potential ▪ Considerable impacts to existing lease holders ▪ Moves vehicular traffic closer to residences along Okpik Street ▪ Requires extensive utility extensions to south side of airport ▪ Airport development near water supply

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Figure 5-11

Barrow Airport Master Plan Update

Alternative 5

Ahkovak Street realignment and lease lot expansion (LL3), GA tie-down relocation, full length north and south side parallel taxiways (PT1 and PT3), new south side lease lots and access road (LL2), M&O land reserve in northeast corner (M&O1), and USCG/DMVA northeast corner land reserve (SLUR1)

- Airport boundary
- BRL (928')
- LL3, Expanded lease area
- LL3, Ahkovak realignment
- Access road option 1
- Access road option 2
- M&O1, expanded north of runway
- SLUR1, 7.5 acres
- 4.5 acre apron for SLUR1
- LL2, 12.5 acres
- LL2, 7.5 acre apron
- PT3, south side parallel taxiway
- PT1, north side parallel taxiway
- Relocated GA tie-downs
- X Removed Taxiway

Data Sources:
ADOT & PF
North Slope Borough, Dept. of Planning,
imagery date: July, 2012

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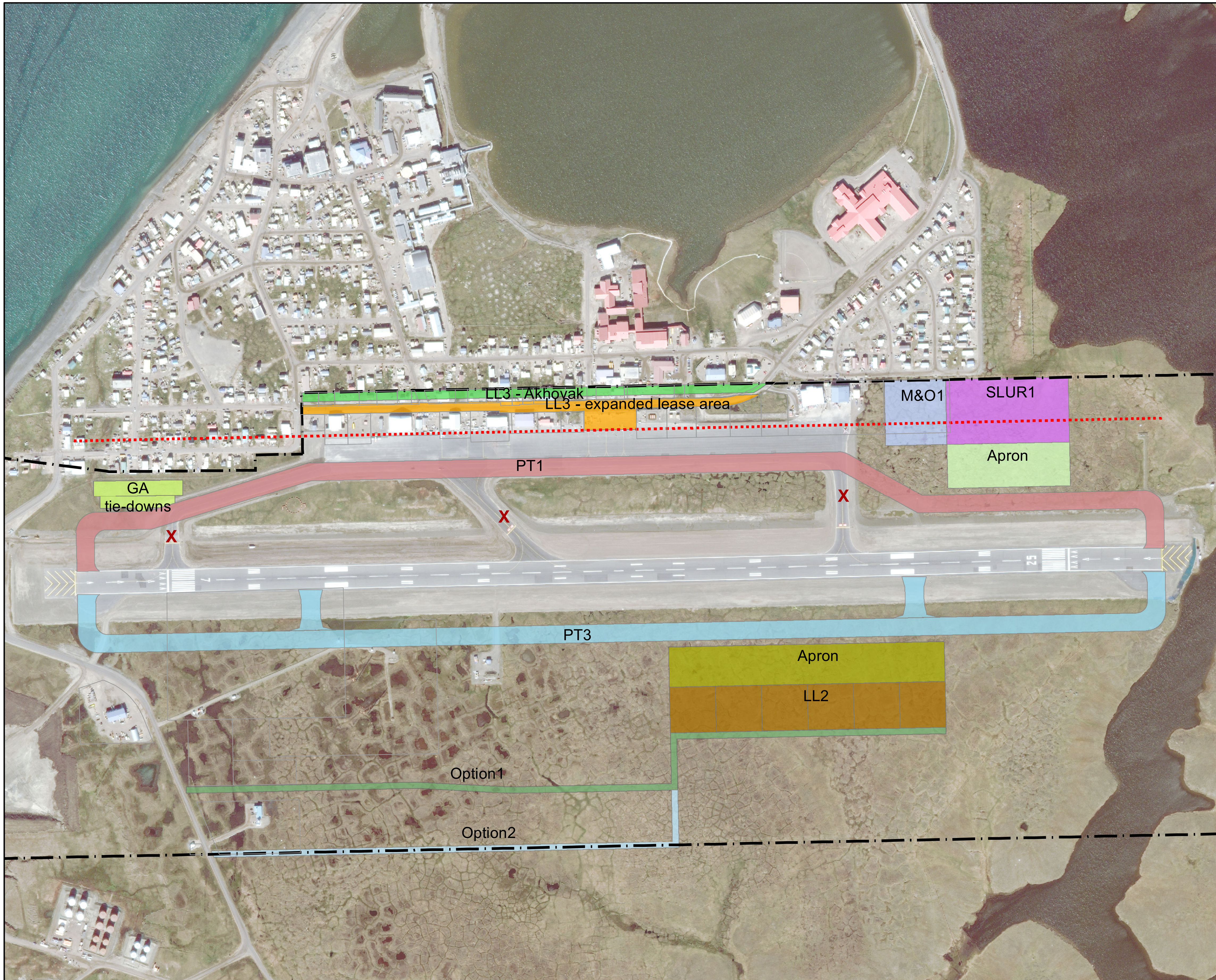

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5.4.6 Alternative 6

PT2 & PT3	Full-Length North and South Side Parallel Taxiways
LL2	New South Side Lease Lots and Access Road
LL3	Ahkovak Street Realignment, Lease Lot Expansion, GA Tie-Down Relocation
M&O2	South Side M&O Land Reserve
SLUR2	South Side DMVA/USCG Land Reserve

Airside Development

A full-length parallel taxiway is constructed on the north side of the runway, utilizing the edge of the existing apron where possible. Taxiway A is relocated and Taxiway B is removed. Taxiway C remains in place, and a new Taxiway D is constructed at the eastern end. A full-length parallel taxiway with four connecting taxiways is also constructed on the south side of the runway.

Landside Development

Ahkovak Street is realigned between Kiogak Street and the intersection of the eastern end of Ahkovak Street with the airport property boundary. The road is moved to the north edge of the airport property. This requires the relocation of existing lease holders in Blocks 200, 400, and 600. The remaining lease lots are expanded north to the boundary of the new Ahkovak Street right-of-way. GA tie-downs are relocated to the western end of a new parallel taxiway. The area vacated by the relocated GA tie-downs becomes a new lease lot. Six more new lease lots are designated on the south side of the runway and an adjacent apron is constructed. A vehicle access road is constructed to the new lease area from Emaiksoun Road. Two land reserves are established on the south side of the runway—an ADOT&PF M&O reserve and a USCG/DMVA reserve.

Advantages and Disadvantages

Advantages	Disadvantages
▪ Utilizes existing embankment for north side taxiway ▪ Accommodates proposed off-airport development to the south ▪ USCG/DMVA operations separated from residential areas ▪ Moves non-aeronautical uses off airport property	▪ Considerable fill in wetlands and areas with high likelihood of cultural resources ▪ Considerable impacts to existing lease holders ▪ Moves vehicular traffic closer to residences along Okpik Street ▪ Extensive utility extensions necessary to south side

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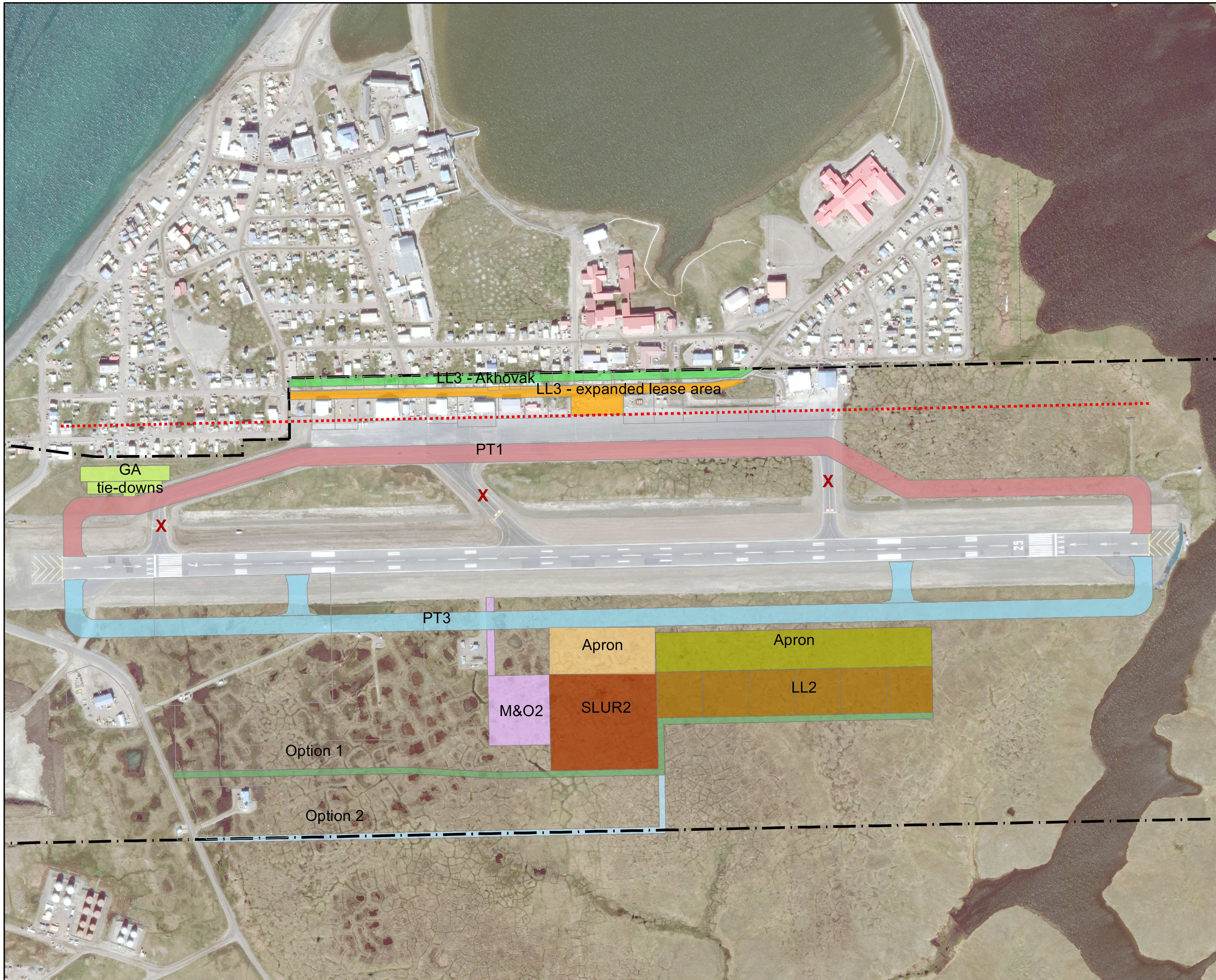
Figure 5-12
Barrow Airport Master Plan Update
Alternative 6

Ahkovak Street realignment and lease lot expansion (LL3), GA tie-down relocation, new south side lease lots and access road (LL2), full length north and south side parallel taxiways (PT2 and PT3), south side M&O and DMVA/USCG land reserves (M&O2 and SLUR2)

- Airport boundary
- BRL (928')
- LL3, Expanded lease area
- SLUR2, apron
- SLUR2, 7.5 acres
- M&O2, south of airport
- Access road option 1
- Access road option 2
- LL2 apron, 480,000 sq ft.
- LL2, 12.5 acres
- PT3, south side parallel taxiway
- PT1, north side parallel taxiway
- LL3, Ahkovak realignment
- Relocated GA tie-downs
- X Removed Taxiways



Data Sources:
ADOT & PF
North Slope Borough, Dept. of Planning,
imagery date: July, 2012

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5.5 Runway Length Alternatives

5.5.1 Alternative R1 – Non-Standard EMAS Installation on the Eastern End of the Runway

This alternative would construct a 450-foot-long EMAS on the eastern end of the runway and shift the threshold 300 feet to the east. FAA would need to approve the non-standard installation.

Advantages	Disadvantages
▪ B737-700 can fly at Maximum Landing Weight	▪ Need for specialty maintenance equipment ▪ Doesn't fully accommodate the 737-800 ▪ Not likely operational in the near term (before the 737-800 becomes the design aircraft)

5.5.2 Alternative R2 – Increased Maintenance Efforts

ADOT&PF would increase maintenance efforts at BRW in order to achieve "Medium" or better runway condition codes during contaminated runway situations.

Advantages	Disadvantages
▪ No new construction required	▪ Difficult to maintain "medium" runway code during slippery conditions, even with additional operations ▪ Must be funded by State of Alaska

5.5.3 Alternative R3 – No Action/Airlines Fly Light

If ADOT&PF takes no action, the burden of lightening loads on aircraft to allow landing on a contaminated runway will remain with the air carriers. Essentially, each carrier will have to make a judgment call about reported runway conditions and decide whether to fly with less than maximum payload or cancel the flight altogether.

Advantages	Disadvantages
▪ No cost to ADOT&PF ▪ Immediate implementation	▪ May result in cancelled flights ▪ May result in higher passenger fares

5.6 Alternatives Evaluation

The consultant team and ADOT&PF met on September 20, 2013, to evaluate the six alternatives presented above, as well as the three runway length alternatives. The group evaluated each alternative against 37 criteria in five categories—safety, function/engineering, environmental impacts, best planning tenets, and fiscal factors. The session included discussion of the pros and cons of each alternative.

Two alternatives—Alternatives 3 and 6—emerged from the evaluation session as having the most favorable components.

Initially, the installation of a non-standard EMAS emerged as the preferred mechanism for providing additional landing distance. However, follow-up conversations with FAA and Alaska Airlines led to the dismissal of this option due to:

- The cost of installing an EMAS bed outweighs any potential economic benefits provided by 300 feet of additional landing distance.
- FAA does not support a reduction in the Runway Safety Area to gain additional landing distance.

Because Alternatives 3 and 6 were viewed as nearly equal by the evaluation team, they were subsequently refined and combined to develop a single preferred alternative, presented below. The table below lists the benefits of the changes resulting from this combination.

Change	Benefit
BRL shift of 110 feet	Maximizes the use of the existing apron while allowing tenants to expand facilities
North side parallel taxiway adjacent to apron	Utilizes existing embankment and maintains snow storage areas in the airport infield
Reduction in number of GA tie-downs	Allows relocation of the GA tie-downs adjacent to the FSS while leaving enough room for the parallel taxiway and still meeting tie-down demand
Include one new lease lot in the northeast corner and five new lots on the south side	Accommodates industrial development on the south side while still allowing growth of air taxi or other non-industrial use on the north side

Table 5-1 – Alternatives Evaluation

Criterion	No-Build	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Safety							
Approach Capabilities	NC	Requires waiver for south side	NC	NC	Requires south-side waiver	NC	NC
Airport Security	NC	Potentially easier access control	Requires additional controls on south side	Requires additional controls on south side	Reconfiguration of north-side fencing and gates	Reconfiguration of north-side fencing and gates	Reconfiguration of north-side fencing and gates
Reduction in Wildlife Hazard Potential	NC	Infield waterfowl habitat reduced	Infield waterfowl habitat reduced; south-side fencing would reduce potential for caribou on airfield	Infield waterfowl habitat reduced; south-side fencing would reduce potential for caribou on airfield	NC	South-side fencing would reduce potential for caribou on airfield	South-side fencing would reduce potential for caribou on airfield
Landside Safety (pedestrians, ATVs, cars)	NC	NC	NC	NC	Potential for pedestrian facilities along Ahkovak St.	Potential for pedestrian facilities along Ahkovak St.	Potential for pedestrian facilities along Ahkovak St.
Meets FAA Standards	Taxiway B enters runway in “high energy area”	No south-side parallel taxiway	Yes	Yes	No south-side parallel taxiway	Yes	Yes
TSA Considerations	NC	Access to GA tie-downs controlled through FSS	South-side access controls necessary; access to GA tie-downs controlled through FSS	South-side access controls necessary; access to GA tie-downs controlled through FSS		South-side access controls necessary	South-side access controls necessary
Function & Engineering							
Construction Considerations (access roads, staging, etc.)	NA	Moderate duration; new south-side and northeast access roads	Long duration; new south-side and northeast access roads; good staging potential	Long duration; new south-side access roads; good staging potential	Moderate duration; new south-side and northeast access roads	Long duration; new south-side access roads; good staging potential	Long duration; new south-side access roads; good staging potential
M&O Considerations	NC	Lose infield snow storage; second largest apron area	Lose infield snow storage; greatest apron and taxiway area; M&O facilities farthest from runway center	Lose infield snow storage area; greatest apron and taxiway area	Smallest amount of new pavement; maintain infield snow storage area	Second greatest apron and taxiway area; M&O facilities farthest from runway center	Maintain infield snow storage area
Vehicle Access & Circulation	NC – Terminal area remains congested	NC – Terminal area remains congested	Long south-side access road; NC to terminal area access or parking	Long south-side access road; NC to terminal area access or parking	New parking near terminal area; Ahkovak St. realigned	New parking near terminal area; Ahkovak St. realigned; long access road to south side	New parking near terminal area; Ahkovak St. realigned; long access road to south side
Geology / Long-Term Stability	NC	Moderate use of existing embankment; no southern parallel taxiway	Moderate use of existing embankment; longest access roads	Moderate use of existing embankment	Greatest use of existing embankment; no south-side parallel taxiway	Moderate use of existing embankment; longest access roads	Moderate use of existing embankment; longest access roads
Level of Service / Operational Efficiency	NC	Smallest geographic extent of airport facilities; convenient to town	South-side access further from town; may need to transport passengers between north and south sides; greatest geographic extent of airport facilities	South-side access further from town; may need to transport passengers between north and south sides	Smallest geographic extent of airport facilities; convenient to town	South-side access further from town; may need to transport passengers between north and south sides; greatest geographic extent of airport facilities	South-side access further from town; may need to transport passengers between north and south sides

Criterion	No-Build	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Impacts to Users	NC	GA close to FSS	GA close to FSS	GA close to FSS	Better parking and pedestrian access; Ahkovak St. realignment displaces some businesses; GA far from facilities and FSS	Better parking and pedestrian access; Ahkovak St. realignment displaces some businesses; GA far from facilities and FSS	Better parking and pedestrian access; Ahkovak St. realignment displaces some businesses; GA far from facilities and FSS
Technically Feasible	NA	Yes	Yes	Yes	Yes	Yes	Yes
FAA Navaids (siting, removal, relocation)	NC	ASOS and segmented circle relocated	ASOS, glide slope, segmented circle relocated; need special glide slope	ASOS, glide slope, segmented circle relocated; need special glide slope	ASOS relocated	ASOS and glide slope relocated; need special glide slope	ASOS and glide slope relocated; need special glide slope
Utility Extensions	NA	Moderate	Extensive	Moderate	Extensive	Extensive	Extensive
Environmental Impacts							
Hazardous Materials	NC	Potential tenant development could impact ADEC Haz ID 2325	Potential tenant development could impact ADEC Haz ID 2325	Potential tenant development could impact ADEC Haz ID 2325	Possible impact to ADEC Haz ID 2325 with Ahkovak St. realignment	Possible impact to ADEC Haz ID 2325 with Ahkovak St. realignment	Possible impact to ADEC Haz ID 2325 with Ahkovak St. realignment
Land Use / Ownership	NC	GA relocation to FSS apron	GA relocation to FSS apron	GA relocation to FSS apron	GA relocation to west end; north-side tenants relocated	GA relocation to west end; north-side tenants relocated	GA relocation to west end; north-side tenants relocated
Wetlands	NA	68 acres	91 acres	95 acres	53 acres	75 acres	79 acres
Potential to Encounter Human Remains	NC	Northeast development near known site	High risk of inadvertent discovery on south side; northeast development near known site	High risk of inadvertent discovery on S side	Least potential; northeast development near known site; GA tie-downs near known site	High risk of inadvertent discovery on south side; northeast development near known site; GA tie-downs near known site	High risk of inadvertent discovery on south side; GA tie-downs near known site
Potential Historic Properties	NC	GA tie-downs have high potential for 2 sites	GA tie-downs have high potential for 2 sites	GA tie-downs have high potential for 2 sites	Ahkovak realignment has potential impacts	Ahkovak realignment has potential impacts	Ahkovak realignment has potential impacts
Drinking Water Supply	NC	Greatest amount of development close to lagoon	Moderate potential for impact	Moderate potential for impact	Greatest amount of development close to lagoon	Moderate potential for impact	Moderate potential for impact
Stormwater Management	NC	Greatest amount of development near lagoon	Moderate amount of development near lagoon	Least amount of development near lagoon	Greatest amount of development near lagoon	Greatest amount of development near lagoon	Least amount of development near lagoon
Noise	NC	Northeast development near residential area; military ops on south side	Military ops in northeast corner near residential area; industrial development on south side	New development on south side, away from residential areas	Northeast development near residential area; military ops on south side; Ahkovak realignment brings vehicle noise closer to residential area	Military ops in northeast corner near residential area; industrial development on south side; Ahkovak realignment brings vehicle noise closer to residential area	New development on south side, away from residential areas; Ahkovak realignment brings vehicle noise closer to residential area
Threatened & Endangered Species	NC	South-side development near Steller's eider nests	Lowest potential impact	Highest potential impact to Steller's eiders	South-side development near Steller's eider nests	Lowest potential impact	Highest potential impact to Steller's eiders
Fish & Wildlife	NC	All alternatives similar	All alternatives similar	All alternatives similar	All alternatives similar	All alternatives similar	All alternatives similar

Criterion	No-Build	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Best Planning Tenets							
Separation of Helicopters from Fixed-Wing Aircraft	NC	Low separation potential	Moderate separation potential	Good separation potential	Low separation potential	Moderate separation potential	Good separation potential
Compatibility with Other Regional & Local Plans	NC	Doesn't accommodate south-side off-airport development	Accommodates south-side off-airport development	Accommodates south-side off-airport development	Doesn't accommodate south-side off-airport development	Accommodates south-side off-airport development	Accommodates south-side off-airport development
Land Use Compatibility	NC	Northeast development near residential area	USCG/DMVA development near residential area	Industrial development is away from residential area	Northeast development near residential area	USCG/DMVA development near residential area	Industrial development is away from residential area
Future Growth/Expansion Possibilities	None	Limited on south side	Additional opportunities on south side and off-airport	Additional opportunities on south side and off-airport	Limited on south side	Additional opportunities on south side and off-airport	Additional opportunities on south side and off-airport
Project Phasing & Implementation	NA	Good opportunities for phasing	Excellent opportunities for phasing	Excellent opportunities for phasing	Good opportunities for phasing	Good opportunities for phasing	Excellent opportunities for phasing
Socially & Politically Feasible	Does not accommodate increasing demand for development opportunities at BRW	Likely resistance to development in northeast corner; does not accommodate off-airport development to the south	Likely resistance to development in northeast corner	Likely favorable	Likely resistance to development in northeast corner; does not accommodate off-airport development to the south; possible resistance to Ahkovak St. realignment	Likely resistance to development in northeast corner; possible resistance to Ahkovak St. realignment	Possible resistance to Ahkovak St. realignment
Highest & Best Use of Airport Property	NC	Non-aeronautical uses remain	Non-aeronautical uses remain	Non-aeronautical uses remain	Non-aeronautical uses moved off-airport	Non-aeronautical uses moved off-airport	Non-aeronautical uses moved off-airport
Fiscal Factors							
Construction Costs	NA	$75.6 million	$120.6 million	$120.6 million	$49.9 million	$94.9 million	$94.9 million
M&O Costs	NC	Moderate	High	High	Moderate	Moderate	Moderate
Funding Availability (traditional & non-traditional sources)	NC	Typical of other airports	Possible private funding or in-kind contributions for south-side access	Possible private funding or in-kind contributions for south-side access	Typical of other airports	Possible private funding or in-kind contributions for south-side access	Possible private funding or in-kind contributions for south-side access
Funding Eligibility (e.g., state or federal)	NC	Eligible for typical FAA funding	South-side access road on boundary not eligible for FAA funding	South-side access road on boundary not eligible for FAA funding	Eligible for typical FAA funding	South-side access road on boundary not eligible for FAA funding	South-side access road on boundary not eligible for FAA funding
Property Acquisition / Relocations	NA	NA	NA	NA	Necessary for Ahkovak St. realignment	Necessary for Ahkovak St. realignment	Necessary for Ahkovak St. realignment

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5.6.1 Preferred Alternative

Airside Development

Two full-length parallel taxiways are constructed—one on the north side and one on the south side. Each parallel taxiway includes four connecting taxiways. Existing Taxiways A, B, and C are relocated.

Landside Development

North of the runway, this alternative shifts the BRL 110 feet south and expands the apron 60 feet southward. Existing lease lot boundaries are also extended to the south, providing more space for tenants. GA tie-downs are relocated to the western end of the apron, next to the FSS tie-downs, thereby opening up a new lease lot north of the runway. One new lease lot is designated in the northeast corner and the apron is extended to the east to accommodate it.

On the south side of the airport, five new 300' x 300' lease lots are established south of the runway, and a new apron is constructed. Land reserves for ADOT&PF M&O and USCG/DMVA are also designated on the south side. An access road leads from Emaiksoun Road to the new south side development; whether this road will lie within airport property or on the boundary has not yet been determined. An access road on the boundary line (LL2, Option 2) could not be built with FAA funds but would allow joint use by non-airport-related traffic and support UIC’s planned development on lands south of the airport property.

There is also a need for an internal airport access service road inside the secure area to connect the future south apron to the north apron. This service road will be developed in conjunction with the south side apron. Until the internal airport service road is constructed, the existing public road infrastructure will continue to be used to transit between the north and south sides of the runway.

Table 5-3 – Alternatives Comparison: No-Build vs. Preferred Alternative

Criterion	No-Build	Preferred Alternative
Safety		
Approach Capabilities	NC	NC
Airport Security	NC	South-side development requires fencing
Reduction in Wildlife Hazard Potential	NC	Fencing on south side would limit potential for caribou on runway; some waterfowl habitat reduction in infield
Landside Safety (pedestrians, ATVs, cars)	NC	Better pedestrian and vehicle separation with Ahkovak St. realignment
Meets FAA Standards	Northern parallel taxiway not full-length; Taxiway B enters runway within "high energy area"	Yes
TSA Considerations	NA	Access to GA tie-downs through FSS
Function & Engineering		
Construction Considerations (access roads, staging, etc.)	NA	South-side development close to material site(s); good potential for staging
M&O Considerations	NC – Facilities remain undersized	Infield snow storage maintained; M&O reserve sized to accommodate personnel and equipment
Vehicle Access & Circulation	NC – Continued congestion around terminal area	Parking and congestion issues remedied with Ahkovak St. realignment
Geology / Long-Term Stability	NC	New construction on undisturbed ground
Level of Service / Operational Efficiency	NC	Opportunities for tenants to expand terminal and cargo facilities
Impacts to Users	NC	Likely unseen, but beneficial
Technically Feasible	NA	Yes
FAA Navaids (siting, removal, relocation)	NC	Segmented circle and glide slope relocated
Utility Extensions	NA	Requires considerable utility extensions to south side
Environmental Impacts		
Hazardous Materials	NC	Possible disturbance of ADEC Haz ID 2325
Land Use / Ownership	NC	GA tie-downs near FSS
Wetlands	NA	77 acres
Potential to Encounter Human Remains	NA	Potential for inadvertent discovery with south-side development
Potential Historic Properties	NA	Potential for impacts with Ahkovak St. realignment

Criterion	No-Build	Preferred Alternative
Drinking Water Supply	Minimal potential for impacts from new deicing procedures	Minimal potential for impacts
Stormwater Management	Minimal potential for impacts from new deicing procedures	Increased impervious surfaces
Noise	NC	New development on south side away from residential areas
Threatened & Endangered Species	NC	Potential impacts to Steller's eider from south-side development
Fish & Wildlife	NC	Minimal impacts
Best Planning Tenets		
Separation of Helicopters from Fixed-Wing Aircraft	NC – Helicopter ops remain intermixed with fixed-wing ops	Phased separation of helicopter operations possible
Compatibility with Other Regional & Local Plans	NC – Does not accommodate off-airport development south of the airport	Accommodates south-side off-airport development
Land Use Compatibility	NC	Moves non-aeronautical uses off airport property; industrial development on south side consistent with local zoning
Future Growth/Expansion Possibilities	Limited	Excellent; high potential for additional south-side development
Project Phasing & Implementation	NA	Good opportunities for project phasing; south-side development near material site(s)
Socially & Politically Feasible	Does not accommodate demand for development opportunities at BRW and adjacent lands	South-side development favorable to community; Ahkovak realignment may face political resistance
Highest & Best Use of Airport Property	Non-aeronautical uses remain on airport	Moves non-aeronautical uses off airport; GA tie-down area resized and relocated to meet demand
Fiscal Factors		
Construction Costs	NA	$71.9 million
M&O Costs	NC	Increased costs due to additional areas to maintain
Funding Availability (traditional & non-traditional sources)	NC	Traditional funding opportunities similar to other airports; potential for private funds or in-kind contributions
Funding Eligibility (e.g., state or federal)	NC	South-side access road on boundary not eligible for FAA funds
Property Acquisition / Relocations	NA	Requires relocation of businesses for Ahkovak St. realignment

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Figure 5-13
Barrow Airport Master Plan Update
Preferred Alternative

BRL shift 110 feet south, GA tie-down relocation, Ahkovak Street relocation, lease lots expanded to south of Akhovak and north of the new BRL, full-length north and south side parallel taxiways, and south side M&O and DMVA/USCG land reserves.

- BRL
- Tie downs
- Security fence
- M&O access road
- South access road option 1
- South access road option 2
- M&O reserve
- New lease lots
- Special land use reserve
- Expanded aprons
- Taxiways
- Ahkovak realignment
- Expanded lease lots (south)
- Expanded lease lots (north)
- Airport Boundary
- X Removed taxiways

Data Sources:
ADOT & PF
Imagery date: September 2013

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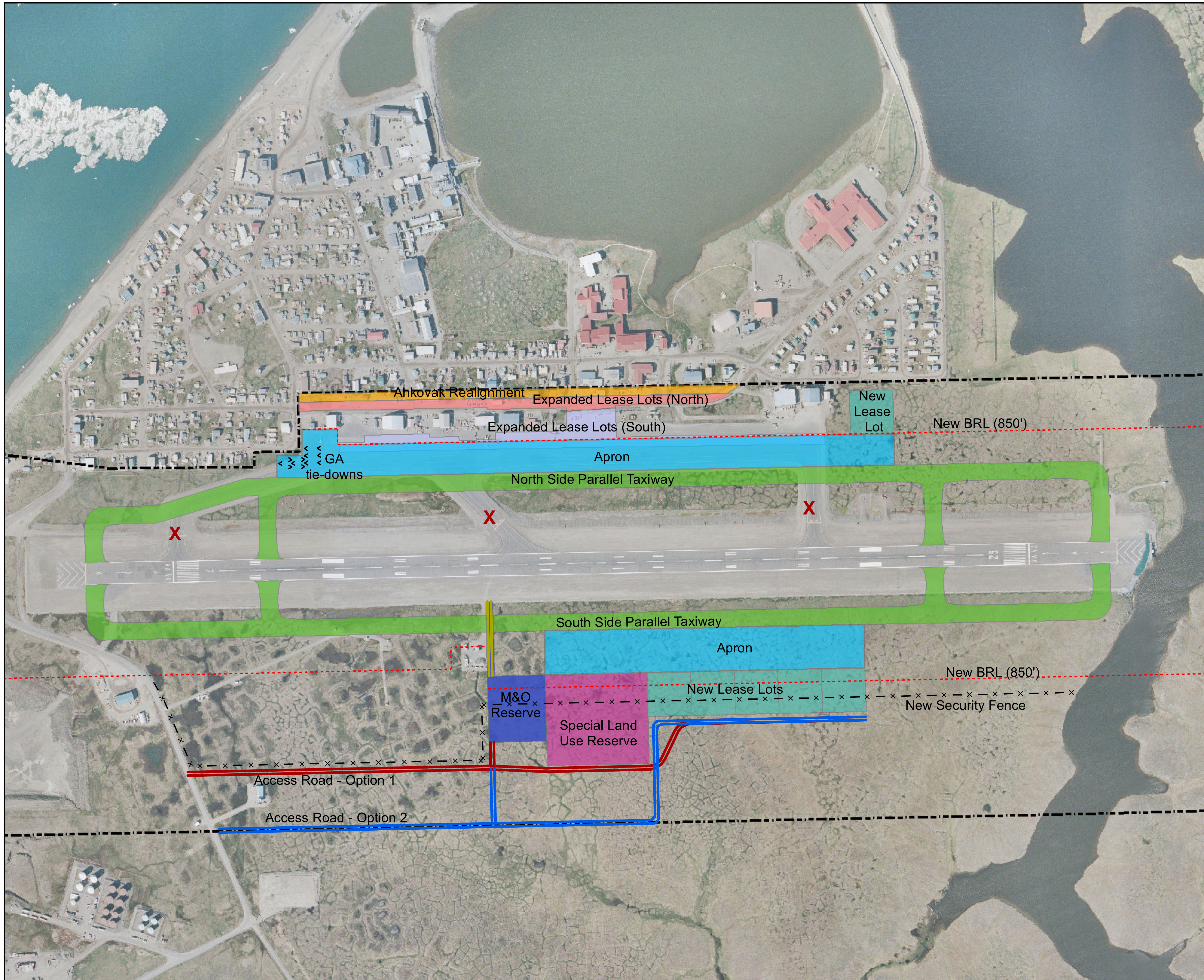
Prepared For:



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6 Implementation Plan

The implementation plan incorporates airport improvements identified in the facility requirements analysis (Chapter 4) with the preferred alternative identified in the alternatives evaluation (Chapter 5) and the existing airport Capital Improvements Plan (CIP) to produce a plan for future project development. The plan balances funding constraints, project sequencing limitations, environmental processing requirements, agency approvals, and sponsor preferences. This chapter of the master plan is intended to become one of the primary references for decision-makers responsible for implementing plan recommendations.

The implementation plan is presented in three phases. Because conditions change from year to year, each phase represents a period rather than a calendar date. The first phase of the plan contains more detail than subsequent phases. Airport management should periodically review the appropriate time for development and adjust as needed to account for changing circumstances such as funding availability and actual demand for facilities and improvements. The 20-year development program totals $171.2 million. A detailed explanation of available funding sources is presented in the Financial Feasibility Plan (Chapter 7).

- Phase I – Short term (0 to 5 years)
- Phase II – Medium term (5 to 10 years)
- Phase III – Long term (10 to 20 years)

The short-term projects in a master plan typically make up the 5-year CIP and represent the highest priority airport needs. Medium- and long-term development is a speculative range of projects beyond the CIP. These projects are less detailed to reflect the imprecise nature of long-range facility planning. Changes in airport conditions, such as unstable foundation soils or unexpected changes in funding priorities, require modifications to the implementation plan and should be verified with an updated master plan.

Projects identified as necessary in Chapter 4 that are not critical to airport function are included in the years beyond the master planning period (2033).

The preliminary project costs outlined in this chapter are order-of-magnitude "planning level" costs. Actual costs will differ based on the final project scope and design. The planning level cost estimates presented here, all in 2013 dollars, include:

- Construction (earthwork, paving, lighting)
- Construction administration
- Mobilization/de-mobilization
- Contingency costs

The cost and availability of gravel is a major consideration for development at BRW. ADOT&PF will need to work closely with local government and private landowners during project design to ensure that an adequate supply of material is located.

6.1 ADOT&PF's Responsibilities

When Airport Improvements Program (AIP) funding is used, airport projects must be closely coordinated with the FAA. In general, for each project ADOT&PF will be responsible for the following:

- Verifying the justification supporting the project and updating the planning-level cost estimates
- Design of the project and preparation of the environmental document and permit applications
- Preparing and issuing a bid package for project construction, management, and related construction services
- Preparing and submitting grant applications
- Project construction management, right-of-way acquisition or certification, and utility relocations or certifications
- Project administration, including FAA grant maintenance and closeout

6.2 Project Phasing

6.2.1 Near-Term Projects

Projects recommended for the near term include repair of the runway and development of new infrastructure such as M&O facilities, a parallel taxiway, and additional apron area. The sequencing of near-term projects is based on the most imminent needs of the airport and includes those projects necessary to develop mid- and long-term projects.

I-1 – Runway Repair..$3.6 million

Purpose

The western end of the runway has developed a large depression between the Runway 7 threshold and the end of the runway. This depression is large enough that Alaska Airlines has instructed their pilots to start their takeoff run from the Taxiway A intersection, effectively reducing the takeoff run available from 7,100 feet to 5,900 feet.

Scope

Excavate approximately 200 feet of the runway to a depth of 6 feet; reconstruct and repave; install MALSR and threshold lights; reapply striping and pavement markings

Prerequisites

None

Anticipated Environmental Document

Categorical Exclusion

Figure 6 - 1
Barrow Airport Master Plan Update

Phase I (0-5 years)

Near-term Projects:
I-1 - Runway Repair - $3.6 million
I-2 - M&O Facilities[1]- $13.5 million
I-3 - Apron Expansion - $12.0 million
I-4 - Stormwater Plan - $0.1 million
I-5 - South Side Parallel Taxiway - $40 million

Total: $69.2 million (2013 dollars)

- Preferred Alternative Components
- M&O Facilities & Access Road
- Apron Expansion
- Stormwater Management Plan
- South Side Taxiway
- Runway Repair

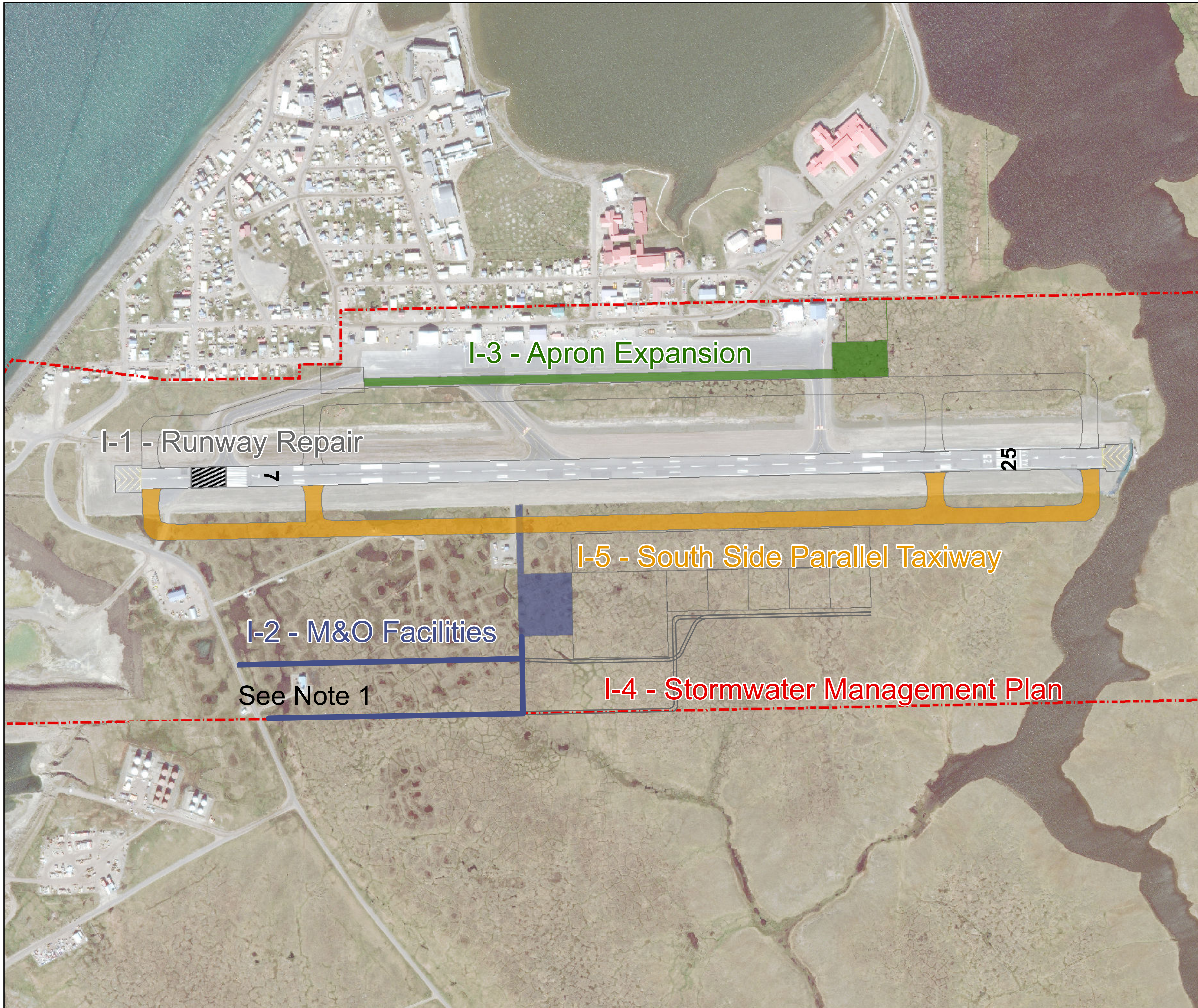
Note 1:
The location of the south side access road to be determined by funding source.

Data Sources:
ADOT & PF
North Slope Borough, Dept. of Planning
Imagery date: July, 2012

0 500 1,000 2,000
Feet

N

Prepared For:



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I-2 – Maintenance & Operations Facilities ....$13.5 million

Purpose

New M&O facilities are needed in the near-term to accommodate changes in airport deicing regulations and the subsequent need for additional deicing chemical storage, new chemical applicator vehicles, and additional snow removal equipment.

ADOT&PF's maintenance facility at BRW is currently at maximum capacity and situated on a parcel that does not allow expansion of the building. There are two primary drivers for expanding the M&O facility:

- As a result of new deicing regulations, ADOT&PF must now stockpile a liquid deicing agent and specialized equipment for applying the new agent.
- Additional maintenance efforts will be needed in order to maintain a clear runway surface for the design aircraft (737-700 in the near term and 737-800 in the long term) during inclement weather. This will require additional sand and vehicle storage facilities.

Scope

Construct a 184,000 square foot pad on the south side of the runway, with an access road to the runway and an access road from Emaiksoun Road. Construct a new 11,500 square foot Aircraft Rescue and Firefighting and Snow Removal Equipment Building (ARFF/SREB), along with a sand storage facility and a chemical storage facility with a capacity of 10,000 gallons.

Prerequisites

None

Anticipated Environmental Document

Environmental Assessment

I-3 – Apron Expansion ....$12.0 million

Purpose

Expand the existing apron to the south and east to accommodate aircraft wingtip clearances on the apron and a newly designated lease lot (90,000 square feet). This is also the first step in the process of shifting the BRL 110 feet south (Project III-4).

Scope

Construct 205,000 square feet of new apron, including lighting and markings, along the south edge of the existing apron; construct 135,000 square feet of new apron, including lighting and markings, at the eastern edge of the existing apron.

Prerequisites

None

Anticipated Environmental Document

Categorical Exclusion

I-4 – Stormwater Management Plan $100,000

Purpose

Develop a stormwater management plan in anticipation of future construction projects and federal water quality regulations.

Scope

Develop a stormwater management plan for the airport property.

Prerequisites

None

Anticipated Environmental Document

N/A

I-5 – South Side Parallel Taxiway ....$40 million

Purpose

The FAA has indicated that any aviation development on the south side of the runway is going to require a full-length parallel taxiway in order to allow BRW to maintain the current approach minimums. The DMVA has indicated that they could begin development of joint USCG/DMVA facilities on the south side as soon as 2016. Therefore, a parallel taxiway is needed in the near term to accommodate this development and facilitate additional industrial development at the airport.

Scope

Construct a full-length parallel taxiway on the south side of the runway, including connecting taxiways, lights, signs, and markings. Relocate the glide slope indicators. Extend perimeter security fencing on the south side of the airport towards the east.

Prerequisites

None

Anticipated Environmental Document

Environmental Assessment

Figure 6 - 2
Barrow Airport Master Plan Update
Phase II (6-10 years)

Mid-term Projects:
II-1 - South Side Apron - $16.0 million
II-2 - Master Plan & ALP Update - $1.5 million
II-3 - ARFF/SREB Expansion - $1.5 million
II-4 - Runway Repaving - $12 million

Total: $31 million (2013 dollars)

Airport Boundary
Preferred Alternative Components
South Side Apron & Access Road
Runway Repaving
Phase I Projects

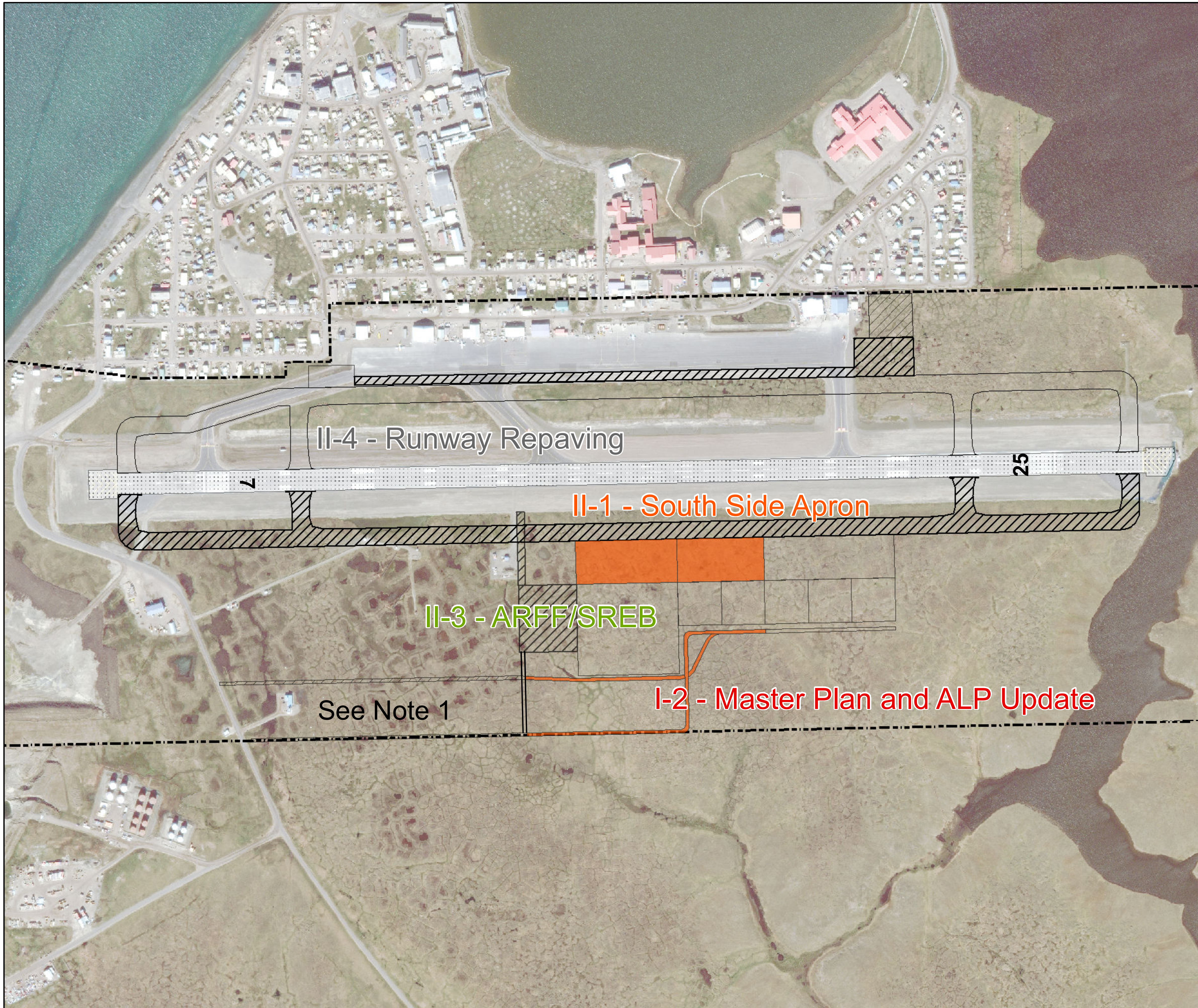
Note 1:
The location of the south side access road to be determined by funding source.

Data Sources:
ADOT & PF
North Slope Borough, Dept. of Planning
Imagery date: July, 2012

0 500 1,000 2,000
Feet

N

Prepared For:



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6.2.2 Medium-Term Projects

II-1 – South Side Apron & Access Road ....$16 million

Purpose

Develop an apron on the south side of the runway to facilitate the development of new lease lots.

Scope

Construct a 9-acre paved apron, including lighting and markings, on the south side of the runway. Extend the access road constructed under Project I-2 to the new apron.

Prerequisites

I-2

Anticipated Environmental Document

Environmental Assessment

II-2 – Airport Master Plan and Airport Layout Plan Update.....$1.5 million

Purpose and Scope

Perform an aeronautical survey and update the Airport Layout Plan to reflect changes in the airfield. Update the airport master plan to validate or revise the mid- and long-range programs.

Prerequisites

None

Anticipated Environmental Document

N/A

II-3 – ARFF/SREB Expansion ....$1.5 million

Purpose

Construct a fourth bay on the ARFF/SREB to accommodate additional equipment.

Scope

Construct a new 20’ x 80’ bay on the ARFF/SREB.

Prerequisites

I-2

Anticipated Environmental Document

Categorical Exclusion

II-4 – Runway Repaving..$12.0 million

Purpose

The runway pavement will require replacement near the end of the medium term.

Scope

Repave the runway and apply new pavement markings; apply pavement markings and lights on the south side parallel taxiway for use as a temporary runway during repaving

Prerequisites

I-5

Anticipated Environmental Document

Categorical Exclusion

6.2.3 Long-Term Projects

III-1 – South Side Apron Expansion ....$10.5 million

Purpose

Continue development of an apron on the south side of the runway to facilitate lease lot development.

Scope

Construct a 9-acre paved apron on the south side of the runway, including lighting and markings adjacent to the apron constructed under Project II-1; extend the access road completed under Project II-1.

Prerequisites

II-1

Anticipated Environmental Document

Environmental Assessment

III-2 – North Side Parallel Taxiway..$40 million

Purpose

Construct a full-length parallel taxiway on the north side of the runway to allow a shift of the BRL.

Scope

Construct a full-length parallel taxiway on the north side of the runway, including connecting taxiways, lights, signs, and markings; relocate the segmented circle; remove the existing Taxiways A, B, and C.

Prerequisites

None

Anticipated Environmental Document

Environmental Assessment

Figure 6 - 3

Barrow Airport Master Plan Update

Phase III (10-20 years)

Long-term Projects:
III-1 - South Side Apron[1]- $10.5 million
III-2 - North Side Parallel Taxiway - $40 million
III-3 - Apron Repaving - $5.7 million
III-4 - BRL Shift - $ N/A
III-5 - GA Tie-downs - $1.3 million
III-6 Ahkovak Street Realignment and
Lease Lot Expansion (North) - $13.5 million

Total: $71 million (2013 dollars)

- Airport Boundary
- BRL Shift (850')
- Phase I projects
- Phase II projects
- South side apron expansion
- New GA Tie-downs
- Apron Repaving
- North side parallel taxiway
- Akhovak Realignment
- X Removed under III-2

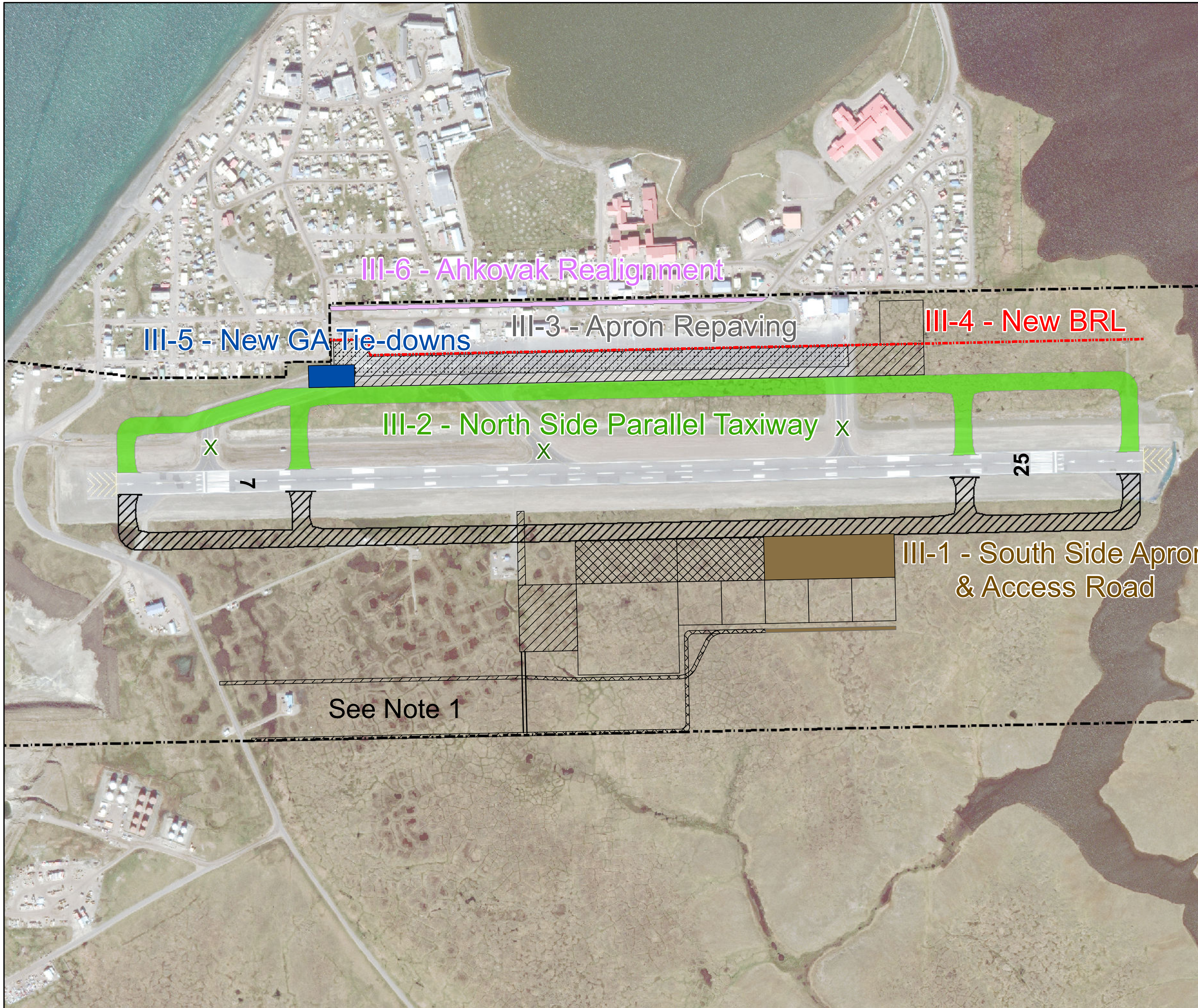
Note 1:
The location of the south side access road to be determined by funding source.

Data Sources:
ADOT & PF
North Slope Borough, Dept. of Planning
Imagery date: July, 2012

0 500 1,000 2,000
Feet

N

Prepared For:



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III-3 – Apron Repaving .... $5.7 million

Purpose

Repave the north side apron from the new BRL (Project III-4) to the edge of the pavement constructed under project I-3; by this time, the pavement will be nearly 20 years old.

Scope

Mill and pave the north side apron between the BRL and the expanded apron (Project I-3); includes pavement markings.

Prerequisites

None

Anticipated Environmental Document

Categorical Exclusion

III-4 –BRL Shift and Lease Lot Expansion .... N/A[1]

Purpose

Move the BRL 110 feet to the south and expand the existing lease lots 50 feet beyond the new BRL.

Scope

Administratively change the BRL from 960 feet to 850 feet from the runway centerline and expand existing apron-front lease lots to 50 feet beyond the BRL. Update the airport's Land Occupancy drawings.

Prerequisites

I-3 and III-2

Anticipated Environmental Document

N/A

III-5 – Relocation of GA Tie-downs .... $1.3 million

Purpose

Relocate existing GA tie-downs to the west end of the apron to allow the designation of a new lease lot.

Scope

Construct 20,000 square feet of apron at the west end of the existing apron. Relocate 14 tie-downs to this apron; install tie-downs, lighting, markings, and signage. Designate the old tie-down area as a new lease lot.

Prerequisites

I-3 and III-2

Anticipated Environmental Document

Categorical Exclusion

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[1] The BRL shift & lease lot expansion costs would be minimal and likely associated with another project (e.g., III-2)

III-6 – Ahkovak Street Realignment and Lease Lot Expansion ....$13.5 million

Purpose

Realign Ahkovak Street to the northern edge of the airport property boundary to allow expansion of the existing apron-front lease lots and alleviate vehicle congestion.

Scope

Realign Ahkovak Street between Kiogak Street and the intersection of the eastern end of Ahkovak Street with the airport boundary. The street will be moved to the north edge of the airport property and existing lease holders in Blocks 200, 400, and 600 will be relocated. Expand the existing apron-front lease lots northward to the new Ahkovak Street right-of-way.

Prerequisites

None

Anticipated Environmental Document

Environmental Assessment

6.3 Estimated Costs

Table 6-1 – Estimated Project Costs

	Project Description	Total Estimated Cost	AIP Eligible?
Phase I: 2014-2019			
I-1	Runway Repair	$3.6 million	Yes
I-2	M&O Facilities	$13.5 million	Yes[2]
I-3	Apron Expansion	$12.0 million	Yes[3]
I-4	Stormwater Management Plan	$0.1 million	
I-5	South Side Parallel Taxiway	$40.0 million	Yes
	Phase I Total	**$69.2 million**	
Phase II: 2019-2024			
II-1	South Side Apron	$16.0 million	Yes[2,3]
II-2	Master Plan & ALP Update	$1.5 million	Yes
II-3	ARFF/SREB Expansion	$1.5 million	Yes
II-4	Runway Repaving	$12.0 million	Yes
	Phase II Total	**$31.0 million**	
Phase III: 2024-2034			
III-1	South Side Apron Expansion	$10.5 million	Yes[2,3]
III-2	North Side Parallel Taxiway	$40.0 million	Yes
III-3	Apron Repaving	$5.7 million	Yes
III-4	BRL Shift and Lease Lot Expansion	N/A	No
III-5	Relocation of GA Tie-downs	$1.3 million	Yes
III-6	Ahkovak Street Realignment and Lease Lot Expansion	$13.5 million	Maybe
	Phase III Total	**$71.0 million**	

[2] A south side access road constructed on the airport boundary (i.e., shared use) would not be eligible for AIP funds
[3] Lease lot development would not be AIP-eligible

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7 Financial Analysis

This section presents an analysis of financial feasibility of airport improvements for the Wiley Post/ Will Rogers Memorial Airport (Barrow Airport) Master Plan. The discussion includes existing revenue streams and expenses, as well as potential sources of funding from bonding, passenger facility charges, airport landing fees, in-kind contributions, and public-private partnerships. The section concludes with a discussion about local hire and job skills development opportunities.

7.1 Existing Operating Revenues and Expenses

This section summarizes current operating revenues and expenses, as well as the Barrow Airport's ongoing Capital Improvements Plan (CIP).

7.1.1 Operating Revenues

The Barrow Airport currently has three funding sources: State General Funds, Leasing Revenue, and Federal TSA Grants. In the state's fiscal year 2013, the airport received $1.96 million of funding, mostly comprised of nearly $1.79 million from State General Funds, with an additional $164,000 received from leasing revenues (Zenger, 2013). Table 7-1 summarizes the amounts received in fiscal years 2009–2013 in each of the revenue categories.

Table 7-1 – Barrow Airport Operating Revenues by Category, Fiscal Years 2009–2013

Fiscal Year	Facility	Revenue Category			Total ($)
		State General Fund ($)	Leasing ($)	Federal TSA Grant ($)	
2013	Aviation	1,659,498	163,856	6,953	1,830,307
	Facilities	130,549			130,549
	Total	1,790,047	163,856	6,953	**1,960,855**
2012	Aviation	1,491,959	145,358	31,188	1,668,505
	Facilities	69,764			69,764
	Total	1,561,723	145,358	31,188	**1,738,269**
2011	Aviation	855,857	143,214	34,824	1,033,895
	Facilities	50,697			50,697
	Total	906,555	143,214	34,824	**1,084,593**
2010	Aviation	638,051	137,788	33,662	809,501
	Facilities	27,543			27,543
	Total	665,593	137,788	33,662	**837,043**
2009	Aviation	597,020	143,057	26,865	766,941
	Facilities	54,959			54,959
	Total	651,979	143,057	26,865	**821,901**

Source: Zenger (2013)

7.1.2 Operating Expenses

The Barrow Airport incurred expenses of $1.96 million in fiscal year 2013. Supplies and personnel were the largest expense categories, together accounting for more than 75% of total expenses. Table 7-2 provides details on the airport's operating expenses for fiscal years 2009-2013.

Table 7-2 – Barrow Airport Operating Expenses by Category, Fiscal Years 2000-2013

Fiscal Year	Facility	Expense Category					Total ($)
		Personnel ($)	Travel ($)	Maintenance ($)	Utilities ($)	Supplies ($)	
2013	Aviation	586,134	74,523	309,110	22,089	838,450	**1,830,307**
	Facilities	50,936	19,930	9,962	19,113	30,608	**130,549**
	Total	637,070	94,453	319,072	41,202	869,058	**1,960,855**
2012	Aviation	522,740	86,551	282,987	19,041	757,185	**1,668,505**
	Facilities	14,224	6,869	23,615	12,958	12,098	**69,764**
	Total	536,964	93,420	306,602	32,000	769,283	**1,738,269**
2011	Aviation	467,671	46,828	264,891	17,433	237,073	**1,033,895**
	Facilities	4,584	4,407	17,585	9,443	14,678	**50,697**
	Total	472,255	51,234	282,477	26,876	251,751	**1,084,592**
2010	Aviation	393,632	61,701	224,298	13,372	116,498	**809,501**
	Facilities	627	2,250	9,163	6,546	8,957	**27,543**
	Total	394,259	63,951	233,461	19,918	125,455	**837,044**
2009	Aviation	354,461	52,876	256,661	11,727	91,216	**766,941**
	Facilities	17,129	2,565	11,458	7,642	16,165	**54,959**
	Total	371,589	55,442	268,119	19,370	107,381	**821,900**

Source: Zenger (2013)

Maintenance expense has varied over the years shown due to changes in the types of expenses incurred. Table 7-3 provides more detail about the maintenance expense categories.

Table 7-3 – Barrow Airport Detailed Maintenance Expense Categories, Fiscal Years 2009-2013

Category	Expense ($) by Fiscal Year				
	2013	2012	2011	2010	2009
SEF Equipment Operating & Replacement Costs	166,251	105,271	107,570	100,038	95,694
Bulk Fuel	60,154	59,749	32,650	46,747	50,083
Chemicals/Sand	26,950	0	100,857	3,752	0
Asphalt	29,841	35,700	119	0	0
Grader Blades	40,450	0	0	9,782	5,170
Equipment Purchase	420,849	0	0	0	0
TSA Agreement	18,214	78,993	78,076	48,522	44,038

Source: Zenger (2013)

In comparing the airport's annual revenues with its expenses, the Barrow Airport's expenses regularly exceed its revenues. The vast majority of its revenues come from state and federal funding rather than activities at the airport. As a result, it does not have any surpluses to cover improvements without external support.

7.1.3 Capital Improvement Program

The Barrow Airport has eight CIP projects underway, with total funding of $12.5 million. Of that amount, 87 percent has been expensed, with $1.6 million of funds remaining on the projects. Table 7-4 summarizes the airport's current capital projects.

Table 7-4 – Barrow Airport Capital Projects

Project Name	State ID	Funding ($)	Expenses ($)	Balance ($)
Barrow Ahkovak Street Upgrade	60460	451,000	169,522	281,478
Barrow Airport Apron Expansion	61435	1,001,000	882,784	118,216
Barrow Airport ARFF Bay Addition with Sand Storage	61706	250,000	5,691	244,309
Barrow Airport Deicing Chemical Storage Building	62378	501,000	33,901	467,099
Barrow Airport Master Plan Update	61974	600,000	591,093	8,907
Barrow Arctic Research Center Road	76970	860,501	518,150	342,351
Barrow ARFF Freezeback System Chiller Replacement & OSA DM FY13	62209	125,000	19,948	105,052
Barrow Runway & Apron Paving & Safety Area Expansion	63506	8,717,789	8,699,822	17,967

Source: Zenger (2013)

7.1.4 Historic Airport Improvement Program Funding

The Federal Aviation Administration, through its Airport Improvements Program (AIP), provides grants to public agencies for planning and development of public use airports. Over the last 30 years, the Barrow Airport has been the recipient of nearly $56 million of AIP funding (see Table 2-15 on page 2-41).

7.2 Funding Plan and Revenue Enhancement

This section discusses the improvements noted in the implementation plan and their cost (see Chapter 6), then lays out sources of funding. The analysis looks solely at funding sources and does not attempt to evaluate the feasibility of the funding plan, nor does it include a benefit-cost analysis of the implementation plan.

7.2.1 Summary of Expenditures in Implementation Plan

The current implementation plan includes three phases of development, totaling $171.2 million. As shown in Table 7-5, funding needs will begin with $69.2 million in the 2014–2019 period, $31.0 million in 2019–2024, and $71 million in 2024–2034.

Table 7-5 – Summary of Improvement Costs by Phase

Phase	Period	Implementation Program Expenditure ($)
Phase I	2014–2019	69.2 million
Phase II	2019–2024	31.0 million
Phase III	2024–2034	71.0 million
Total		**171.2 million**

Details about the projects in the implementation plan can be found in Chapter 6.

7.2.2 Sources of Funding for Implementation Plan

This section discusses four sources of funding: bonding, Passenger Facility Charges (PFCs), landing fees, and other sources. At present, the Barrow Airport does not charge Passenger Facility Charges or landing fees. While these fees are discussed below, even if they were to be implemented, they would not likely be able to fund more than a very small portion of the annual debt obligation associated with the planned improvements. Realistically, legislative appropriations and external grants and other support appear to be the only viable sources of funding for the planned capital improvements.

Using debt obligations to fund the airport improvements will result in annual debt costs ranging from 3 to 7.5 times the current operating cost for the airport, representing a significant burden on state funding and highlighting the need to identify additional funding sources.

Given the current fiscal situation faced by the state and federal governments, it will be challenging to acquire financial support for the implementation plan. Funding will likely need to come from several sources, some of which are conventional (state and federal appropriations, debt issues funded with new revenues sources, etc.) and some that are less common (in-kind contributions, local support, and public-private partnerships).

Bonding

It appears that issuance of bonds and capital appropriations by the Alaska Legislature are the two feasible options for funding the Barrow Airport's implementation plan. The caveat is that bonding creates an obligation that would need to be repaid from external sources since revenues generated by the airport would not be sufficient to cover more than a small portion of the debt costs.

FAA AC 150/5070-6B (FAA, 2007) mentions four categories of bonds that might be used for airport projects:

- General obligation (GO) bonds
- Revenue bonds
- Special facility revenue bonds
- Industrial development bonds

GO bonds are issued and backed by the full faith and credit of the issuer, which results in a lower risk of default and therefore lower required interest rate compared to revenue bonds, which are backed by a specific revenue stream. In Barrow's case, revenues are insufficient to justify the use of revenue bonds and therefore GO bonds would be the preferred approach for aviation facilities.

The final category of bonds listed by the FAA is tied to industrial development that would attract business, increase non-aeronautical leasing, and promote industrial development in an area. The Alaska Industrial Development and Export Authority (AIDEA) would be the appropriate authority to issue industrial development bonds for facilities at the Barrow Airport. However, public airport facilities are not eligible for AIDEA funding, though AIDEA funding could potentially be used for other developers of industrial or export-related facilities at the airport (see AIDEA and Federal Express example in Section 7.4).

This analysis assumes that the airport would use GO bonds issued by the City of Barrow, North Slope Borough, or State of Alaska. The Alaska Municipal Bond Bank Authority (AMBBA) issues bond packages for local governments in the state and would be the likely issuer for bonds associated with the Barrow Airport. At present, yields for 20-year municipal bonds range from 3.75% to 4.45% for AAA- and AA-rated issuers at the national level (FMSbonds, Inc., 2013). This is very low compared to long-term historical rates and slightly low when compared to recent AMBBA debt issues (AMBBA, 2012). For planning purposes, it is prudent to assume bond yields of 5.0–5.5% over the course of the planned improvements. This analysis uses the upper end of that range to be conservative.

This analysis assumes that bonds will be issued at the start of each phase for the full amount needed for that phase. Table 7-5 summarized the starting years and funding needs for each phase. All bond issues are assumed to have a 20-year term and a 5.5% yield. Each bond package is assumed to have a 2.5% issuance cost built in to the total issue amount.

Assuming the full cost of each phase is covered through the issuance of debt, Table 7-6 shows projected debt issues for the three phases of planned improvements. The table shows the issuance amounts for each phase (including a 2.5% issuance cost), the annual debt obligation if the debt is amortized, and the final year of payment. To the extent that appropriations offset a portion of the improvement costs, the debt issue amounts and annual obligation would be reduced proportionally.

Table 7-6 – Projected Debt Issues, by Phase

Debt Issuance	Year of Issue	Implementation Program Expenditure ($)	Issuance Amount ($)	Annual Debt Obligation with Amortization ($)	Year of Final Payment
Phase I	2014	69.20 million	70.97 million	5.94 million	2034
Phase II	2019	31.00 million	31.79 million	2.66 million	2039
Phase III	2024	71.00 million	72.82 million	6.09 million	2044
Total		**171.20** million	**175.59** million		

Note: Assumes a 2.5% issuance cost, 5.5% yield, and 20-year term for each bond.

Due to the phased approach of debt issues, the annual debt obligation will change over time. Table 7-7 provides a summary of the annual amortized cost resulting from the phased debt issues. Annual amortization costs will reach nearly $14.7 million in 2024, once debt has been issued for each of the three phases, and will decline with the retirement of Phase I debt in 2034 and Phase II debt in 2039.

Table 7-7 – Summary of Annual Amortized Costs, Fiscal Years 2014–2044

Period	Annual Amortized Cost ($)
2014–2018	5.94 million
2019–2023	8.60 million
2024–2034	14.69 million
2035–2039	8.75 million
2040-2044	6.09 million

If bonds were issued for improvement to the Barrow Airport, much or all of the costs would need to be covered externally, likely from the state. PFCs, discussed below, would likely cover only a small portion of debt costs (approximately 0.95% in the peak 2024–2034 period), assuming the Barrow Airport would receive FAA authorization to assess them.

It is possible that the City of Barrow or the North Slope Borough could levy a property tax to cover airport costs or the payment of the airport's debt, but this would require an agreement outlining how the funding arrangement would work since the Barrow Airport is owned by the State of Alaska. No such agreement is currently in place elsewhere in the state. The City of Barrow does not levy a property tax, while the North Slope Borough's property tax rate is currently 18.5 mills (ADCCED, 2013).

Passenger Facility Charges

The Aviation Safety and Capacity Expansion Act of 1990 provided airports with an additional source of funding for capital projects in the form of Passenger Facility Charges (PFCs). Under this Act, PFCs may be used as a source of funding for airport-related projects that preserve or enhance safety, capacity, or security of the national air transportation system; reduce noise from an airport that is part of the system; or furnish opportunities for enhanced competition between or among air carriers.

The Aviation Safety and Capacity Expansion Act authorizes a public agency to impose a PFC of $1.00, $2.00, or $3.00 per enplaned passenger at commercial airports it controls. The Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, which was enacted in 2000, included authorization to charge a PFC at the $4.00 and $4.50 levels provided specific eligibility requirements are met.

As in the case of operating surpluses, PFC revenues are: 1) used on a "pay-as-you-go" basis, where PFC collections and interest earnings are spent directly on capital projects; and/or 2) leveraged; that is, used to pay debt service on bonds. Airport operators must obtain approval from FAA before they begin the collection and use of such revenues. ADOT&PF has the authority to impose a PFC subject to federal regulations. However, federal legislation prohibits a public agency from imposing a PFC on any passenger for whom the following conditions apply:

- On any flight to an eligible point on an air carrier that receives essential air service compensation on that route. The Administrator makes available a list of carriers and eligible routes determined by the US DOT for which PFCs may not be imposed under this section.
- On enplanements in Alaska aboard an aircraft having a certificated seating capacity of less than 60 passengers.

As of October 1, 2013, 288 small hub, non-hub, and commercial service airports and 59 large and medium hub airports, are approved to collect at the $4.50 PFC level (FAA, 2013). In Alaska, four airports are currently collecting PFCs: Juneau International, Fairbanks International, Anchorage International, and Ketchikan International. For Barrow Airport to qualify to collect a PFC, it would have to petition the FAA. There are a number of exclusions the Barrow airport would have to obtain, including its service to a population of less than 10,000, and the fact that the community is not connected to a state highway system. Because of these circumstances, there are several requirements that would have to be met, so it is not certain if this program would be feasible for Barrow.

Should the ADOT&PF choose to petition the FAA to collect a PFC at BRW, Alaska Airlines would be the only carrier required to pay because their aircraft are the only ones with more than 60 passengers that currently serve BRW.

During 2012, there were 31,315 enplanements on aircraft with over 60 seats. Therefore, the Barrow Airport could raise approximately $140,000 by collecting a $4.50 PFC. This is a substantial funding source, equal to nearly 10 percent of the airport's operating expense in fiscal year 2012 (approximately $1.8 million), but it would only cover a tiny portion of the funding needs for the preferred alternative.

Airport Landing Fee[1]

An airport owner may impose a two-part landing fee consisting of a combination of a per-operation charge and a weight-based charge provided that (1) the two-part fee reasonably allocates costs to users on a rational and economically justified basis; and (2) the total revenues from the two-part landing fee do not exceed the allowable costs of the airfield.

Alaska is experiencing a general trend towards use of larger aircraft carrying a greater number of passengers per aircraft. The design aircraft for BRW is the 737-800, with a passenger capacity of 157. It is a reasonable assertion that larger aircraft are subject to landing fees based primarily on their weight, for which the airport sponsor must be compensated to maintain the facilities, such as pavement and apron areas, for the aircraft's future use.

To ensure the viability and security of an airport landing fee, it is recommended that the State pursue reasonable use agreement discussions with existing and potential large aircraft operators utilizing facilities at Wiley Post/Will Rogers Memorial Airport. This process could take the form of a simple letter informing the user(s) that a landing fee is assessed for a particular aircraft configuration.

The most viable course of action to pursue this end is to proceed with establishing landing fees by utilizing a compensatory approach to establishing those fees. In this model of rates and charges determination, the user is charged based on their actual use for the facility from which they derive a benefit. A fee is levied against the user to cover the corresponding cost of the expenses to maintain and operate the facility. Furthermore, the cost/rate of the imposed fee is based on the aircraft operator's prorated share of occupancy or usage. This share of usage or occupancy can be based on total weight of the aircraft or annual operational activity. A landing fee for large aircraft operators might be classified under different term such as a ramp fee.

[1] Section Sources: Bowers Field Airport (WA), "Airport Financing Program"; Ketchikan International Airport, Fees; Nome Airport; Fairbanks International Airport (FAI); Anchorage International Airport (ANC); Notice of Proposed Changes in Alaska International Airport System Rates & Fees (6/5/13).

Determination of an actual landing fee/ramp fee amount would be best decided on by the State of Alaska. Suggested landing fees might be $1.00 per 1,000 pounds, or part thereof, of the FAA certified maximum landing weight. Other similar sized airport markets in Alaska have a range of aircraft landing fees that vary between $0.75 to $1.00 per thousand pounds of aircraft weight. It is suggested that these rates should only apply to aircraft, 6,000 lbs. and greater.

As an alternative, a simple flat fee of $10.00 to $12.00 per departure would be a reasonable expectation. Another course of action or alternative might include the State electing to waive a landing fee/ramp fee if the aircraft operator purchases a minimum amount of fuel to assist in recovering costs associated with operation and maintenance of the facility.

Other Sources

In addition to the funding sources discussed above, other forms of financial support may be available for the airport. Programs are highlighted here for two federal agencies in particular: the United States Department of Agriculture (USDA) Rural Development, and the Economic Development Administration (EDA).

USDA Rural Development may offer financial support to the Barrow Airport through its Community Facilities Loans and Grants program. In addition to a loan guarantee program, the agency also offers Community Facility Grants that may be applicable for the Barrow Airport due to the small population of Barrow and the importance of the airport (USDA Rural Development, 2013).

EDA, based under the United States Department of Commerce, may offer financial support to the Barrow Airport, principally in the form of loans or grants for infrastructure. The EDA website lists a number of major programs, the following of which may be directly or indirectly applicable to the Barrow Airport (EDA, 2013):

- **Public Works:** Empowers distressed communities to revitalize, expand, and upgrade their physical infrastructure to attract new industry, encourage business expansion, diversify local economies, and generate or retain long-term, private sector jobs and investment.
- **Economic Adjustment:** Assists state and local interests in designing and implementing strategies to adjust or bring about change to an economy. The program focuses on areas that have experienced or are under threat of serious structural damage to the underlying economic base.
- **Partnership Planning:** Supports local organizations (Economic Development Districts, Indian Tribes, and other eligible areas) with long-term planning efforts. The Comprehensive Economic Development Strategies (CEDS) Summary of Requirements (PDF), provides a synopsis of the requirements for comprehensive economic development strategies.
- **Local Technical Assistance:** Helps fill the knowledge and information gaps that may prevent leaders in the public and nonprofit sectors in distressed areas from making optimal decisions on local economic development issues.

7.3 In-Kind Contributions

In addition to direct financial support from sources discussed above, there may be opportunities for in-kind contributions of labor, equipment, or materials, or other cost-sharing arrangements, at the Barrow Airport. This section discusses some potential sources of in-kind contributions and other unconventional forms of support. These sources were generated through a brainstorming process and many represent thinking outside the box. As a result, some of these sources may not be legally feasible, realistic, or viable, but their inclusion is intended to spur thinking about other opportunities to fund the airport.

The North Slope Borough has offered political support for the Barrow Airport improvements, as discussed in Section 7.5. In addition to the political support, the North Slope Borough could be asked to donate gravel, equipment, or services to construct the airport improvements, or it could be approached to identify other ways it could help to encourage development. The borough would benefit from the increased tax base should additional private development associated with the airport take place (for example, see the note about development south of the airport in Section 7.6.1).

Historically, oil and gas companies have been generous supporters of community programs and facilities. Given Barrow's proximity to current oil production on land as well as potential offshore oil and gas production, oil and gas companies may be interested in providing financial or in-kind support for the Barrow Airport's improvements. This support could be for specific facility elements that are named in recognition of their supporters or support could be made in conjunction with additional advertising or educational opportunities. For instance, a runway could be named in honor of a donor, or an educational display on the history of oil and gas development on the North Slope could be built in the terminal along with some financial support for other improvements.

Regular air carriers that use the Barrow Airport may also be interested in supporting airport construction in exchange for naming or other recognition. Within legal constraints, there may be opportunities for preferential use agreements or other beneficial arrangements.

The regional and local Alaska Native Corporations, Arctic Slope Regional Corporation (ASRC) and Ukpeaġvik Iñupiat Corporation (UIC), respectively, may also be willing to provide financial support to the Barrow Airport's construction. The corporations might also sponsor local training for contractor employees for construction or operations as a way to support local economic development.

The City of Barrow is a potential donor for the airport. It could make a capital contribution for construction, sponsor local training for contractor employees for construction or operations to support local economic development, or offer operating support through in-kind or financial contributions.

Local businesses may be interested in supporting the new airport. Barrow does not appear to have a local chamber of commerce, so this support would need to be handled individually or coordinated through another entity.

Barrow is popular as a tourist destination due to local bird viewing opportunities and its position as the northernmost city in the United States. Local tourism companies may be interested in providing signage or other educational displays associated with Barrow's location. Barrow does not appear to have a local convention and visitors bureau, so this support would need to be handled individually or coordinated through another entity.

Private donors may be encouraged to contribute to funding the construction of the airport. Donations could range from fundraising for construction (like brick or plaque-purchasing programs), starting of a nonprofit organization related to the airport, or private estate donations or endowments that could be used to support the airport and local transportation.

7.4 Public-Private Partnerships (PPP)

Introduction to PPP

"Public private partnerships are arrangements between government and private sector entities for the purpose of providing public infrastructure, community facilities and related services. Such partnerships are characterised by the sharing of investment, risk, responsibility and reward between the partners" (Bojovic, 2006).

Simply deciding to open up traditional public sectors to private finance is not enough to encourage investments. Conditions to enable the possible implementation of PPP include: an adequate legal framework, timely and transparent mapping of costs and predictable revenue streams, reasonable market and political risks, and public acceptance. At the same time the public administration has to have the capacity and skills to manage and negotiate successful projects. It is "necessary, if not sufficient for good performance, to explicitly identify the procedure for selecting partners, the roles of partners, any environmental costs associated with the project, and the risks likely to affect overall performance of a project." (Sagalyn, 2007).

There are many ways of doing business that involve varying degrees of private-sector involvement. The United States General Accounting Office (1999) defines the following varieties of PPPs:

- **Build-Own-Operate (BOO):** Under a BOO transaction, the contractor constructs and operates a facility without transferring ownership to the public sector.
- **Build/Operate/Transfer (BOT) or Build/Transfer/Operate (BTO):** Under the BOT option, the private partner builds a facility to the specifications agreed to by the public agency, operates the facility for a specified time period under a contract or franchise agreement with the agency, and then transfers the facility to the agency at the end of the specified period of time. In most cases, the private partner will also provide some, or all, of the financing for the facility, so the length of the contract or franchise must be sufficient to enable the private partner to realize a reasonable return on its investment through user charges. The BTO model is similar to the BOT model except that the transfer to the public owner takes place at the time that construction is completed, rather than at the end of the franchise period.
- **Buy-Build Operate (BBO):** A BBO transaction is a form of asset sale that includes a rehabilitation or expansion of an existing facility. The government sells the asset to the private sector entity, which then makes the improvements necessary to operate the facility in a profitable manner.
- **Design-Build-Operate (DBO):** In a DBO project, a single contract is awarded for the design, construction, and operation of a capital improvement. Title to the facility remains with the public sector unless the project is a design/build/operate/transfer or design/build/own/operate project. Combining all three phases into a DBO approach maintains the continuity of private sector involvement and can facilitate private-sector financing of public projects supported by user fees generated during the operations phase. However, the DBO method of contracting is contrary to the separated and sequential approach ordinarily used in the United States by both the public and private sectors.
- **Lease/Develop/Operate (LDO) or Build/Develop/Operate (BDO):** Under these partnership arrangements, the private party leases or buys an existing facility from a public agency; invests its own capital to renovate, modernize, and/or expand the facility; and then operates it under a contract with the public agency.

Among the wide spectrum of PPP arrangements, there is not an *a priori* best model; it depends on the specific context. Private funding opportunities in the particular case of Barrow Airport are discussed in the next section.

Private Funding Opportunities for Barrow Airport

There are four general types of private funding opportunities for the Barrow Airport that fall under the umbrella of PPPs, each of which is discussed below. Due to the nature of these arrangements, there is significant overlap of these funding opportunities and private in-kind contributions as discussed in Section 7.3. As with the discussion of in-kind contributions, the examples presented here are intended to spur thinking about PPP opportunities and may not be realistic or viable at the Barrow Airport.

Hybrid PPP

One "hybrid" PPP alternative that could be explored by Barrow airport would be for the state government to hold title to the land on both the airside and landside, and basic infrastructure improvements on the airside including runways and taxiways. Private investment would be emphasized in developing revenue-generating landside facilities—a private developer could be given the responsibility for construction and management of new commercial lease lots (or expansion of existing ones). The developer would lease the land from the local government authority under a long-term agreement, hold title to the facilities, concessions and any other improvements it built on the land, and control development rights on the airport. Financial risks would be shared between the public and private sectors. The public trust would be maintained via the government authority ownership of the airport land, maintenance of AIP grant and other agreements, and terms of the public-private development agreement.

Third-Party Financing

Another type of infrastructure funding that has emerged is third-party financing, in which an entity invests large sums in project design and construction, but may not actually operate the facility. In this financing model, the airport may start by working with a financial advisor to determine if a viable entity exists to underwrite a desired project.

Example: AIDEA and Federal Express[2]

Federal Express management realized the potential of being able to perform line maintenance on their fleet of 747 aircraft operating through Anchorage and approached AIDEA to finance the facility. The facility consists of a hangar capable of accommodating one wide-body aircraft, a ramp, taxiway, road, utilities, and landscaping. The hangar is supported by a fire suppression pump house and water storage facility, which was constructed as part of this project.

Federal Express had a ground lease agreement at the Ted Stevens Anchorage International Airport, which was conveyed to AIDEA. Federal Express signed a 20-year lease with AIDEA for use of the facility. The construction budget was $30.75 million. Tax-exempt bonds ($28 million) sold by AIDEA in September 1992, along with Authority funds, financed the project. The investment will be repaid through user fees.

[2] This section is a summary extract of the example of a PPP reported by the Alaska Industrial Development and Export Authority (AIDEA, 2011).

Private Contributions

Barrow could seek private contributions (including in-kind contributions) as part of an application for a United States Department of Transportation (USDOT) grant. USDOT scores projects higher when a public-private partnership has been or will be established and when the affected community is interested in contributing to the project.

Example: Small Community Air Service Development Program[3]

The Small Community Air Service Development Program (SCASDP) is a grant program managed under USDOT's Office of Aviation Analysis. The core objective of the program is to secure enhancements that will be responsive to a community's air transportation needs and whose benefits can be expected to continue after the initial expenditures.

Barrow could apply to the SCASDP following the successful example of five communities in Southeast Alaska. Similar to those communities, Barrow meets the eligibility criteria and presents many of the characteristics that DOT prioritizes in the selection process.

To be eligible for a grant, a community must meet the following criteria:

- **Size:** For calendar year 1997, the airport serving the community or consortium was not larger than a small hub airport, and had insufficient air carrier service or had unreasonably high air fares.
- **Characteristics:** The airport presents characteristics, such as geographic diversity or unique circumstances that will demonstrate the need for, and feasibility of, the program.

In selecting communities to participate in the program, the statute directs the Secretary to give priority to those communities where:

- Average air fares are higher than the air fares for all communities
- A portion of the cost of the activity contemplated by the community is provided from local, non-airport-revenue sources
- A public-private partnership has been or will be established to facilitate air carrier service to the public
- Improved service will bring the material benefits of scheduled air transportation to a broad section of the traveling public, including businesses, educational institutions, and other enterprises whose access to the national air transportation system is limited
- The assistance will be used in a timely fashion
- Multiple communities cooperate to submit a regional or multistate application to consolidate air service into one regional airport

SCASDP grant funds can be used to cover the expenses of new activities that can reasonably be related to improving the air service to the community. In addition, grant funds may be used for financial incentives, such as revenue guarantees to air carriers to provide service, or to ground handling providers. The statute limits the use of grant funds for air carrier subsidy to a maximum period of three years. SCASDP can involve, among others, revenue guarantees, financial assistance for marketing programs, start-up costs

[3] This section is an extract of the Small Community Air Service Development Program description presented in USDOT (2013) and the application made by Southeast Alaska Consortium (2013).

and studies. For FY 2013, up to $11.5 million were made available for SCASDP grants awarded to 25 benefitting communities in 22 states.

In 2013 the communities of Angoon, Elfin Cove, Pelican, Tenakee Springs, and Kake formed a consortium to seek a federal SCASD grant to invest in their marketing plan and air service. The five airports comprising the Consortium found private partners in Alaska Seaplanes and the Juneau Empire newspaper to support the proposal. The proposal requested $300,000 of federal support and provided a commitment of $79,195 in private in-kind contributions ($55,195 in in-kind support from Alaska Seaplanes for web development and various advertising initiatives, and $24,000 in in-kind support from The Juneau Empire newspaper as part of the advertising package in that newspaper).

The Consortium's proposed marketing plan stated that Alaska Seaplanes representatives, as well as members of the Consortium communities, will participate in the Juneau Convention and Visitors Bureau and in trade shows in western US. Grant funds would also produce ads in websites and newspapers in Juneau and Anchorage. Regional and national travel writers would be invited to visit Consortium communities and write about their experiences.

Example: Platinum Airport Runway Extension Project Public/Private Partnership[4]

According to ADOT&PF's 2012 Annual Report (ADOT&PF, 2012):

> Coastal Villages Region Fund (CVRF) opened a new $41 million seafood processing plant at Platinum in 2009, which processes about 4,000,000 lbs of salmon annually from the Kuskokwim delta. Currently all of the fish is sold in frozen product form, though CVRF could sell product into the global fresh seafood market, which commands a higher price. The runway at Platinum airport is too short to accommodate a fully loaded Hercules C-130 air cargo plane required for transporting fresh fish.
>
> CVRF proposed a runway extension at Platinum airport from the existing 3,300 ft to 5,000 ft to facilitate the shipping of fresh fish to global markets. This runway extension will add value to the processed fish, and is important to Alaska because the plant employs more than 250 residents from western Alaska, provides a market for 1000 salmon and halibut permit holders and their crews, and profits go to an Alaskan company. CVRF paid for the survey, appraisal, and purchase of the needed land, and is donating it to the State to expedite the project. This is truly a "public-private" partnership to make an economic development project happen.

Funding Opportunities from the Oil and Gas Industry

Barrow, the northernmost community in the United States, is located on the Chukchi Sea coast, 10 miles south of Point Barrow. It lies almost exactly at the division line between the Chukchi Sea and Beaufort Sea Planning Areas. Because of its location, Barrow is at a comparative disadvantage in terms of distance to the oil and gas leases on these planning areas, since it is near both the Chukchi and Beaufort Seas but Wainwright and Deadhorse are located closer to leases in those areas, respectively. Onshore leases are also concentrated around the Deadhorse area.

[4] This section is an extract from the Alaska Airports and Aviation 2012 Annual Report (ADOT&PF, 2013).

Since distance is one of the determinants of cost effectiveness of air support services, it is not surprising that Deadhorse Airport is the main transportation hub for current oil and gas operations on the North Slope. Deadhorse Airport will likely remain as the main hub for future Outer Continental Shelf (OCS) activities in the Beaufort Sea and onshore future activities (for example, Point Thompson, Liberty, and Greater Mooses Tooth).

OCS activities in the Chukchi Sea could provide some financial opportunities for Barrow Airport in the long term. In the near term, the uncertainty inherent during the exploration phase combined with the relatively limited air support requirements, appear to provide little incentive for companies to invest in Barrow Airport improvements until later phases. For example, recent exploration by Shell Oil was almost 100% supported by watercraft, along with helicopters and fixed-wing aircraft needed for crew changes and, at the end of the year, for rescue and salvage operations. And according to Shell's 2012 exploration plan for the Chukchi Sea (Shell, 2012):

> Resupply will be from Dutch Harbor using an offshore supply vessel (OSV), with some small vessel support out of Wainwright. Aviation operations will be conducted primarily from Barrow with some operations possibly out of Wainwright. These are the plans only for the exploration drilling program covered by this revised Chukchi Sea EP, and do not reflect Shell's longer term commitments for shorebases or other facilities needed to support future exploration drilling plans or development of any of its Chukchi Sea prospects.

In the long term, if commercially developable amounts of oil and gas in Chukchi Sea are confirmed, oil and gas companies could be interested in funding Barrow Airport improvements that would support their development and production activities. These firms would look for a nearby, low-cost airport with sufficient capacity and reliability. Barrow Airport may be farther away than Wainwright, but it has regularly scheduled jet services year-round and a 6,500 feet long by 150 feet wide asphalt runway as opposed to the 4,494 feet long by 90 feet wide gravel airstrip owned and operated by the North Slope Borough at Wainwright. However, oil and gas production for any discoveries in the Chukchi Sea is not forecasted to start until about 2025.

7.5 North Slope Borough Political Support

Political support from the NSB would help individual projects score higher at ADOT&PF's Aviation Project Evaluation Board (APEB), thereby improving the likelihood of obtaining federal funding. Such support could be expressed in a resolution but could also take the form of financial or in-kind contributions.

7.6 Alaska Hire, North Slope Borough Hire, Native Hire, and Job Skills Development

This section discusses job skills development and training programs to support the aviation industry, as well as local resources for Alaska residents, North Slope Borough residents, and Alaska Natives to develop skills and opportunities in the aviation industry.

ADOT&PF noted in its Alaska Airports and Aviation 2012 Annual Report (ADOT&PF, 2013):

> Many people do not realize there are 47,000 aviation related jobs in Alaska, representing 8% of Alaska's economy and 10% of our workforce. The FAA will hire 10,000 new air traffic controllers over the next 10 years. Aviation in Alaska needs hundreds of mechanics, electronics technicians and maintenance personnel. The U.S. needs talented young people to go into Science, Technology, Engineering, and Mathematics (STEM) careers. Hundreds of "baby boomers" are retiring and there is a need to develop a future workforce starting now.

The report highlights the need for skilled workers in the aviation industry and some training programs around the state that are working to meet that need.

7.6.1 Alaska Resident, North Slope Borough, and Alaska Native Hire

Alaska resident hire and employment preference may be required under Alaska law for public works projects with certain job classifications. Though the requirement no longer exists for portions of south central and southeast Alaska (Demer, 2013), it does still apply to the North Slope Borough. Under current program criteria (ADOL&WD, undated), the following classifications qualify for a minimum 90% Alaska resident hire preference, including those most likely needed for public works projects in Barrow:

- Bricklayers
- Carpenters
- Cement masons
- Culinary workers
- Electricians
- Equipment operators
- Insulation workers
- Iron workers
- Laborers
- Mechanics
- Painters
- Piledriver occupations
- Plumbers and pipefitters
- Roofers
- Truck drivers
- Welders

Alaska Native Corporations (ANCs) normally include Alaska Native Hire clauses in their contracts to encourage shareholder employment. The regional and village ANCs for Barrow, Arctic Slope Regional Corporation and Ukpeaġvik Iñupiat Corporation, respectively, would likely do the same for work done at Barrow Airport.

ASRC SKW Eskimos recently completed work on a $37 million contract for improvements at the Barrow Airport (ASRC SKW Eskimos, 2013). Included in that work was a subcontract with ASRC Civil Construction for paving (ASRC Civil Construction, 2013). Another ASRC company, ASRC Builders, has experience with aviation-related construction in the Arctic, including a hangar it built for Bering Air in 2011 in Nome (ASRC Builders, 2013).

UIC's construction company UIC Construction Services has subsidiaries such as UIC Construction, LLC and Kautaq Construction Services, LLC that provide Arctic construction services (UIC Construction Services, 2013). UIC Construction, LLC has completed a number of projects in the region, including a Baker Hughes facility in Deadhorse, the Barrow Global Climate Facility, and a hospital in Barrow (UIC Construction, LLC, 2013). UIC has also developed conceptual plans for development immediately south of the Barrow Airport, which could support increased OCS oil development activities, U.S. Coast Guard operations, and emergency response activities, along with supporting facilities such as fuel storage, water and wastewater treatment, and power generation (Umiaq, 2013).

7.6.2 Local and Regional Aviation Employment, Training

A number of organizations recognize the importance of local training and hire programs, many of which could lead to direct employment in the aviation industry. The ADOL&WD shows that there were 2,087 employed residents in Barrow, of whom 197 or 9.4% were employed in the trade, transportation and utilities industry (ADOL&WD, 2013). Though occupations specific to the aviation industry do not make the list of top occupations, there are several occupations with crossover skills to aviation, including General and Operations Managers; Maintenance and Repair Workers, General; Operating Engineers and Other Construction Equipment Operators; and Plant and System Operators, All Other.

The remainder of this section discusses local and regional educational providers of aviation training.

Iḷisaġvik College

Iḷisaġvik College is a two-year tribal college located in Barrow. The college offers Associate Degrees and certificates in a variety of academic and vocational fields. The college strives to offer programs that have substantial career and employment opportunities in the Arctic and elsewhere in Alaska (Iḷisaġvik College, 2013).

Two programs within the college that may be applicable to the Barrow Airport are the Associated Construction Trades and CDL/Heavy Truck Operations programs, each of which are certificate programs. Given sufficient demand, there may also be opportunities for the college to offer aviation-specific training.

North Slope Borough School District

The North Slope Borough School District operates public schools across the North Slope and has both educational and administrative facilities in Barrow. School facilities include Ipalook Elementary School, Hopson Middle School, Barrow High School, and the alternative high school, Kiita Learning Community. (North Slope Borough School District, 2013). Given sufficient demand, there may be opportunities for school-business partnership activities between the local schools and aviation-related businesses.

Arctic Education Foundation

The Arctic Education Foundation is a non-profit private foundation that offers financial support for eligible students pursuing either a degree or certification, with focus on jobs requiring professionals within the North Slope region (Arctic Education Foundation, 2013). The foundation may be a source of funding for local students who wish to prepare for careers in the field of aviation.

7.6.3 Statewide and National Training

At the statewide level, the University of Alaska system has training programs that can directly benefit students interested in a career in aviation. Various state agencies and programs may also provide training or financial support for training. These training options and others are discussed in this section.

University of Alaska

University of Alaska campus training centers in Anchorage (near Merrill Field) and Fairbanks (Hutchinson Institute of Technology, Fairbanks International Airport) provide the majority of academic aviation training within the state. Table 7-8 shows current offerings from the Anchorage and Fairbanks campuses.

Table 7-8 – University of Alaska Aviation Training Programs, by Training Level and Campus

Training Level	Anchorage Campus	Fairbanks Campus
Certificates	Aviation Maintenance	Airframe Airframe & Powerpilot Gr. Vehicle Maintenance Technology
Associate's Degree	Air Traffic Control Aviation Administration Aviation Maintenance Professional Piloting	Aviation Maintenance Professional Piloting
Bachelor's Degree	Aviation Technology	
Continuing Education	Helicopter Underwater Egress Training Avionics Maintenance & Installation	Avionics Maintenance & Installation

Source: University of Alaska (2008)

The University of Alaska Fairbanks (UAF) program can be completed in 12 months and features an option to continue training in Calgary, Canada at the Southern Alberta Institute of Technology, which allows students to qualify to sit for the Canadian Aircraft Maintenance Engineer license (UAF, 2011).

Aviation Career Education

FAA's Aviation Career Education Academy Program is an aviation summer camp for middle and high school students (FAA, 2013). The academies offer students an opportunity to learn more about aviation. Numerous academies have been held in Alaska, including in the Lower Kuskokwim School District in Bethel and the Challenger Learning Center in Kenai (ADOT&PF, 2013). ADOT&PF (2013) also notes other aviation-related educational offerings, including Introduction to Aviation classes and a private pilot ground class offered at Palmer High School. The Aviation Career Education Academy Program and other similar programs may be excellent outside resources to bring into the North Slope Borough School District to support aviation education.

AVTEC

AVTEC is a vocational technology school operated by ADOL&WD. It offers a number of training programs that are applicable for the construction, operation, and maintenance of facilities at the Barrow Airport, though no aviation-specific programs are currently offered. Selected programs of interest might include the Applied Technology (Combination Welding, Diesel/Heavy Equipment Technologies, and Pipe Welding) and Energy & Building Technology (Facility Maintenance Mechanical Trades, Facility Maintenance Construction Trades, Industrial Electricity, Power Plant Operation, and Related Studies Program) programs (AVTEC, 2012).

Alaska Department of Labor and Workforce Development

Through the Alaska Job Center Network, ADOL&WD offers funding to training providers from both state and federal sources as well as training through Individual Training Accounts (ITAs) (ADOL&WD, 2011). ITAs are issued to individuals seek training through their local Alaska Job Centers and will vary by background, skill levels, and training consistent with the position sought.

ADOL&WD offers a variety of training programs, including (ADOL&WD, 2013):

- Alaska Technical Vocational Education Program (TVEP)
- Alaska Youth First
- Denali Training Fund
- State Training and Employment Program (STEP)
- Workforce Investment Act (WIA) Adult
- WIA Dislocated Worker
- WIA Youth

The STEP program regularly requests training grant proposals from training providers, with particular focus on high wage, high demand occupations in Alaska, a list that includes transportation, construction, and other industries. Many of these training programs that have received STEP grants in the past are focused in the construction and building trades, including building maintenance—key skills for successfully operating almost any airport.

Alaska Department of Commerce, Community and Economic Development Division of Community and Regional Affairs

The Division of Community and Regional Affairs' Grants Section, located within the Alaska Department of Commerce, Community and Economic Development (ADCCED), administers a variety of state and federal grant programs (ADCCED, 2013). The City of Barrow or North Slope Borough might seek funding for the Barrow Airport through some of the available grant programs, such as the Community Coastal Impact Assistance Program, which offers funds to offset impacts of OCS oil and gas activities, or the National Petroleum Reserve-Alaska (NPR-A) Impact Grant Program, which offers funds to mitigate significantly adverse impacts related to oil and gas development within the NPR-A, which could apply to use of the Barrow Airport.

United States Bureau of Indian Affairs

The Bureau of Indian Affairs (BIA), part of the United States Department of the Interior, has a regional Alaska office in Anchorage. That office assumes responsibility for the 229 tribes and estimated 80,000 tribal members in Alaska (BIA, 2013).

The BIA may be able to assist its members with training in the field of aviation, as it maintains 183 schools throughout the U.S., under the Bureau of Indian Education. Several BIA areas are sparsely settled and display the same need for aviation support, trade, medical assistance, and transportation as seen in remote parts of Alaska.

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8 Public Participation

This chapter summarizes the public involvement process conducted for the Barrow Airport Master Plan Update.

As a central part of life in Barrow, the airport and its future are important to a wide range of stakeholders and nearby communities. As such it was important to reach out to people early in the planning process to ensure that their concerns would be consistently understood and considered in the development of this document. To engage the public and key stakeholders in the project and the public process, several tools are being used, as discussed below.

8.1 Agency Coordination

The agency coordination for the duration of the Barrow Airport Master Plan Update consisted of keeping agencies informed throughout the planning process. The following agencies received all communications provided to the public:

- Alaska Aviation Advisory Board
- Alaska Department of Environmental Conservation
- Alaska Department of Fish and Game
- Alaska Department of Natural Resources
  - Division of Coastal and Ocean Management
  - Division of Oil and Gas
  - State Parks/State Historic Preservation Officer
- Alaska Department of Transportation & Public Facilities[1]
- Alaska State Troopers
- Alaska Department of Military & Veterans Affairs
- Bureau of Ocean Energy Management, Regulation and Enforcement
- Federal Aviation Administration[2]
- Ilisagvik College
- National Marine Fisheries Service
- National Park Service
- Tagiugmiullu Nunamiullu Housing Authority
- Transportation Security Administration
- U.S. Army Corps of Engineers / Regulatory
- U.S. Bureau of Land Management, Branch of Energy Minerals in Alaska
- U.S. Coast Guard
- U.S. Department of Homeland Security
- U.S. Department of Interior, Bureau of Land Management
- U.S. Fish & Wildlife Service
- U.S. Geological Survey Energy Resources Program
- U.S. Natural Resources Conservation Service

[1] Specific individuals from ADOT&PF included the following:
Steve Hatter, Deputy Commissioner, Aviation
Steve Titus, P.E., Regional Director, Northern Region (NR)
Jeff Roach, MSS, Planning Manager Aviation & Highways, NR
Ryan Anderson, P.E., Acting Aviation Planner, NR
John Olsen, Barrow Airport Manager, NR
Alexa Greene, Area Planner, NR
William Russell, Maintenance and Operations Supervisor, NR
Jeremy Worrall, Regional Aviation Manager, NR
Bill Cole, P.E., Design Engineering Manager, NR
Lauren Ivanov, Design Engineer, NR
Steve Masterman, Regional Engineering Geologist, NR
David Koester, Construction Engineering Assistant, NR
Thomas Kowalczyk, Aviation Leasing Specialist, NR
Brittany Russell, Environmental Analyst

[2] Specific individuals from the Federal Aviation Administration included the following:
Patricia Oien, Lead Planner, Alaska Region Airports Division
Patricia Sullivan, Environmental Program Manager, Alaska Region Airports Division
Bruce Greenwood, Environmental Protection Specialist
Tom Clark, Alaska Lead Planner, ATO Western Service Center

8.2 Steering Committee

To help identify build alternatives and mitigation strategies a project steering committee was formed at the start of the master plan process. The purpose of this committee was to work with local, state, and federal agencies with jurisdiction over resources within the airport boundary to ensure impacts to natural and cultural resources would be minimized. The steering committee met with the project team in April 2013 to discuss the master plan schedule and identify initial constraints and opportunities. Initial alternative concepts were distributed to the steering committee in September 2013 for comment, and the preferred build alternative was presented to the committee in November 2013. In addition to ADOT&PF and FAA, the steering committee was composed of the following stakeholders:

- Alaska Department of Environmental Conservation
- Alaska Department of Fish and Game
- Alaska Department of Natural Resources
- Alaska State Troopers
- Alaska Department of Military & Veterans Affairs
- National Marine Fisheries Service
- National Oceanic and Atmospheric Administration
- North Slope Borough
- Tagiugmiullu Nunamiullu Housing Authority
- Transportation Security Administration
- U.S. Army Corps of Engineers / Regulatory
- U.S. Dept. of Interior, Bureau of Land Management
- U.S. Coast Guard
- U.S. Environmental Protection Agency
- U.S. Fish & Wildlife Service
- UIC Science, LLC

8.3 Website

The project website, shown at right, was developed to provide public access to basic project information such as the schedule, documents, meeting notifications, and meeting summaries.

Figure 8-1 – Website Homepage (http://dot.alaska.gov/nreg/barrowmp)

8.4 Postcards

Postcards were the primary tool used to inform the public of project developments and meetings. To date three postcards have been mailed.

- **Postcard #1** (February 2013) announced the beginning of the project and invited people to the public meeting on February 26, 2013. This postcard included a link to the project website and an online survey targeting Barrow residents, aircraft operators and businesses.
- **Postcard #2** (August 2013) announced that the team had completed the land use assessment, environmental overview, and the draft aviation forecast. The postcard invited people to the second public meeting on August 19, 2013.
- **Postcard #3** (November 2013) invited Barrow residents and stakeholder agencies to the final public meeting on December 4, 2013. The postcard described the purpose of the meeting, which was to review the draft master plan document and receive public comments about it. It also directed people to the link on the website where the draft document could be review in advance of the meeting.

The postcards were delivered via U.S. Postal Service to all box holders in Barrow. The postcards were also delivered to elected officials, agencies, tribal entities, and other interested parties.

8.5 Public Meetings

8.5.1 Public Meeting #1 – February 26, 2013

The first meeting, which was attended by 41 people, was held on February 26, 2013, at the North Slope Borough Assembly Chambers. The purpose of the meeting was to give an overview of the project and to answer questions. The project team gave a presentation that was interpreted into Inupiat. The team followed the presentation with a question and answer session that was also interpreted.

In addition, the project team distributed paper copies of surveys to solicit input. The three surveys targeted Barrow residents, Barrow air taxi operators/general aviation users, and Barrow businesses. See Section 2.4.1 for more detail.

The outreach for the meeting is outlined in the following table. See Appendix C for the outreach materials and complete meeting notes.

Table 8-1 – Outreach for Public Meeting #1

Date	Outreach Method	Description
2/12/2013	Project website	Project-specific website hosted on the Brooks and Associates server and formatted in accordance with ADOT&PF specifications
2/14/2013	Postcard mailer, all box holders	Inviting the public to the 2/26/13 open house
2/14/2013	Display advertising in *Anchorage Daily News*	Inviting the public to the 2/26/13 open house
2/14/2013 2/21/2013	Display advertising in *Arctic Sounder*	Inviting the public to the 2/26/13 open house
2/14/2013	Display advertising in *Fairbanks Daily News-Miner*	Inviting the public to the 2/26/13 open house

Date	Outreach Method	Description
2/12/2013	State of Alaska Online Notice	Inviting the public to the 2/26/13 open house
2/16/2013 to 2/25/2013	Public service announcement request sent to KBRW-FM and KBRW-AM	Sent with request to broadcast announcement inviting public to meeting
2/18/2013	Constant Contact email	Email inviting project stakeholders to the meeting
2/16/2013 to 2/25/2013	Public service announcement request sent to GCI	Sent with request to broadcast announcement inviting public to meeting

8.5.2 Public Meeting #2 – August 19, 2013

The second meeting was actually a series of meetings held on August 19, 2013 at the North Slope Borough Assembly Chambers; each meeting addressed a different group. During the day there were meetings for representatives of local government, tribal entities, and adjacent landowners. In the evening there was an open public meeting. In total, 54 people signed in. The purpose of the meetings was to present the status of the project and to get feedback from the public on various concepts.

The outreach for the meeting is outlined in the following table. See Appendix C for the outreach materials and complete meeting notes.

Table 8-2 – Outreach for Public Meeting #2

Date	Outreach Method	Description
8/1/2013	Letter mailed to official stakeholders	Letter to all government officials, utilities, tribal entities, UIC, and SKW to invite them to small group meetings preceding the public meeting
8/7/2013	Project website	Project specific website hosted on the Brooks and Associates server and formatted in accordance with ADOT&PF specifications
8/7/2013	Postcard mailer, all box holders	Inviting the public to the 8/19/13 public meeting
8/8/2013	State of Alaska Online Notice	Inviting the public to the 8/19/13 public meeting
8/10/2013	Display advertising in *Fairbanks Daily News-Miner*	Inviting the public to the 8/19/13 public meeting
8/12/2013	Display advertising in *Anchorage Daily News*	Inviting the public to the 8/19/13 public meeting
8/15/2013	Display advertising in *Arctic Sounder*	Inviting the public to the 8/19/13 public meeting
8/9/2013 8/16/2013	Constant Contact email and reminder	Email inviting project stakeholders to the meeting
8/15/2013 to 8/18/2013	Facebook ad campaign	Facebook ad campaign inviting people to the public meeting and providing project website URL
8/12/2013 to 8/18/2013	Public service announcement request sent to GCI, KBRW-FM, and KBRW-AM	Sent with request to broadcast announcement inviting public to meeting
8/15/2013 8/19/2013	Facebook update	Facebook post on the ADOT&PF page inviting people to the public meeting
8/15/2013 8/19/2013	Twitter	Tweet on the ADOT&PF feed inviting people to the public meeting

8.5.3 Public Meeting #3 – December 4, 2013

The third public meeting was held on December 4, 2013, at the North Slope Borough Assembly Chambers. Twenty-eight people signed in. The purpose of the meeting was to review the draft master plan document and receive public comments.

The outreach for the meeting is outlined in the following table. See Appendix C for the outreach materials and complete meeting notes.

Table 8-3 – Outreach for Public Meeting #3

Date	Outreach Method	Description
11/15/2013	Notice on the project website	Inviting the public to the meeting
11/18/2013	Postcard mailer	Inviting the public to the meeting
11/18/2013	Public service announcement request sent to GCI, KBRW-FM, and KBRW-AM	Sent with request to broadcast announcement inviting public to meeting
11/19/2013 12/03/2013	Constant Contact email and reminder	Email inviting project stakeholders to the meeting
11/20/2013	State of Alaska Online Notice	Inviting the public to the public meeting
11/20/2013	Display advertising in *Fairbanks Daily News-Miner*	Inviting the public to the meeting
11/21/2013	Display advertising in *Anchorage Daily News*	Inviting the public to the meeting
11/21/2013	Display advertising in *Arctic Sounder*	Inviting the public to the meeting

8.6 Other Community Activities

8.6.1 Questionnaires

In February 2013, the team prepared and launched an online survey directed at Barrow Airport leaseholders, aircraft operators, and local businesses. Copies of the questionnaire were available at the February public meeting and distributed in person during interviews conducted by the technical staff of the project team. In all, four surveys were returned. A full summary of the issues raised in the surveys is contained in Appendix B with copies of the returned surveys.

8.6.2 Interactive Banner

This was a banner that was displayed in the air carrier's terminals and the AC store to inform people about the project. It was interactive in that it had a QR code that could be scanned with a smart phone linking to the project website.

8.7 Receive and Respond to Public Comment

A summary of key comments raised by the public is provided below. Responses follow each issue. Most comments were received and responded to in public meetings. All public comments received relating to meeting outreach and responses from the project team are available in Appendix C.

8.7.1 Key Comments

Airport Relocation

Benefits

- Could provide a longer runway and larger airport lease lots
- Would move the airport away from coastal weather conditions and potential erosion issues
- Would move the congestion and noise away from the community

Challenges

- The cost of relocation could be in the $600 million range.
- Moving the runway is cost-prohibitive because the State of Alaska receives about $200 million annually in FAA funding for all aviation projects statewide—Barrow, Kotzebue, Nome, etc.
- Environmental impact identification and mitigation would be extensive when filling undisturbed tundra.
- Relocation would require substantial gravel for construction, and material sources in the area are limited.

Runway Length

Can you make the runway longer?

Benefits

- Lengthening the runway would allow the projected aircraft to land under poor runway conditions with full payload.
- Bigger aircraft may accommodate future oil and gas activity in the Beaufort and Chukchi Seas.

Challenges

- Considerable material would be necessary to fill the bluff area adjacent to the Chukchi Sea, and the Instrument Landing System would have to be moved into the ocean.
- An extension to the west could block vehicle access to the area south of the airport.
- Extension toward the lagoon would require extensive engineering efforts to reduce the risk of drinking water contamination.

Leaseholders and Lease Lots

Why don't you expand the Alaska Airlines terminal? It is too small and often crowded, with not enough room for security screenings.

Response

- Leaseholders control when and how to upgrade or enlarge facilities, if lease lot space is available.
- The Barrow Airport Master Plan Update does not address fire codes, snow storage, parking, or maintenance of leaseholder facilities because ADOT&PF does not regulate these activities.

South Side Development

Can an access road to south side development be built on the airport property line to facilitate private, off-airport development?

Benefits

- A shared-use access road could facilitate private development adjacent to airport property.
- A shared-use road could be eligible for non-FAA funding.

Challenges

- A longer access road would cost more and use material that would then not be available for other projects.
- The funding source may restrict access; for example, if FAA funds the access road, it could only be used for airport purposes.

Noise

Why does the plan recommend relocating the general aviation (GA) tie-downs?

Benefits

- Allows for the development of a new, apron-front lease lot
- Puts the transient and GA aircraft close to the Flight Service Station (where pilot services are located) for improved safety
- Separates GA aircraft from commercial operations

Challenges

- Residential areas may experience more noise from GA operations (seasonally).

Why does the plan show a new lease lot in the northeast corner?

Benefits

- This lease lot is not new; it was identified as an ADOT&PF reserve in the previous Airport Master Plan Update. This master plan recommends a smaller lot than originally designated.
- Leasing the lot would allow additional aviation-related development.

Challenges

- There could be noise impacts to nearby residential areas.

Ahkovak Street Relocation

Why relocate Ahkovak Street?

Benefits

- Realigning Ahkovak Street provides expansion room for existing apron-fronting lease lots allowing aviation leaseholders to expand operations.
- Traffic congestion in front of the Alaska Airlines terminal and other airport lease lots would improve.
- Realigning Ahkovak Street provides more airport parking and snow storage space.
- The proposed development takes care of the congestion and non- aviation use issues at a lower cost than relocation of existing aviation uses. Much of the relocation costs for leaseholders would not be eligible for FAA funding. Private leaseholders would have to fund new improvements on the south side.

Challenges

- Current non-aviation businesses renting and occupying airport lease lots on the north side of Ahkovak Street would have to relocate
- Residences closest to the airport in the Ahkovak Street area may experience impacts that would require additional engineering solutions to mitigate

9 Conclusion

An airport master plan is a long-range planning document used to review existing conditions and prepare forecasts that will define future aviation and non-aviation needs of the community. These needs guide the master plan process and are the basis for determining the appropriate role for the airport.

This master plan update shows that in order to meet aviation demand and comply with FAA requirements, the Barrow Airport requires improvements. The implementation plan in Chapter 6 sets the stage for future development by identifying sponsor responsibilities, individual project scopes, funding requirements, and prerequisites thus allowing proper project sequencing. Based on current economic conditions and federal funding changes, implementation of the recommended improvements may require non-traditional funding sources and the ability to leverage existing financing, as outlined in Chapter 7.

Changes in federal policies regarding environmental issues (e.g., stormwater, deicing, air quality), funding priorities (e.g., safety, pavement management, security), and industry regulations, as well as changes in air carrier fleets and aviation technologies, must be monitored to ensure improvements identified in this master plan remain relevant. The oil and gas industry’s use of BRW will have impacts on the timing of airport development projects. Uncertainty in forecasting when and to what extent this will occur requires careful monitoring by ADOT&PF to ensure the airport can meet this demand.

The Wiley Post/Will Rogers Memorial Airport will play a fundamental role in the future of the North Slope and Alaska. Resource exploration and development, increased arctic marine traffic, and regional population growth will expand the role of Barrow and the airport in the region.

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APPENDIX A

Aviation Forecast Approval

From: pat.oien@faa.gov
To: Patrick Cotter; Roach, Jeffery A (DOT)
Cc: pat.oien@faa.gov
Subject: RE: FW: BRW forecast
Date: Thursday, August 29, 2013 10:18:38 AM

Hi Patrick and Jeff,

FAA approves the BRW forecasts

Please verify that the percentages used on the following pages are accurate:
Page 3-8--the 1.9% enplanement growth
Page 3-21-the 2.02 average growth rate of enplanements.

thanks

Pat Oien, P.E.
Lead Planner
FAA Alaska Region
(907)271-5445

From: Patrick Cotter <PatrickCotter@pdceng.com>
To: Pat Oien/AAL/FAA@FAA, "Roach, Jeffery A (DOT)" <jeff.roach@alaska.gov>
Date: 08/14/2013 02:38 PM
Subject: RE: FW: BRW forecast

Good catch. Here is the corrected document.
-Patrick

From: pat.oien@faa.gov [mailto:pat.oien@faa.gov]
Sent: Wednesday, August 14, 2013 2:34 PM
To: Roach, Jeffery A (DOT); PatrickCotter@
Subject: Re: FW: BRW forecast

Can you take a look at page 3-12 on the PDC estimated ops (think it should be 12,865)
If that needs to change..please do that and send me the final version and I will forward to FAA HQ

thanks

Pat Oien, P.E.
Lead Planner
FAA Alaska Region
(907)271-5445

From: "Roach, Jeffery A (DOT)" <jeff.roach@alaska.gov>

To: "Russell, William J (DOT)" <jeff.russell@alaska.gov>, "Worrall, Jeremy L (DOT)" <jeremy.worrall@alaska.gov>, "'pat.oien@faa.gov'" <'pat.oien@faa.gov'>, "'Bruce.Greenwood@faa.gov'" <'Bruce.Greenwood@faa.gov'>, "Cole, Rodney W (DOT)" <rodney.cole@alaska.gov>, "Greene, Alexa J (DOT)" <alexa.greene@alaska.gov>, "Koester, David A (DOT)" <david.koester@alaska.gov>, "Olsen, John K (DOT)" <john.olsen@alaska.gov>, "Royce Conlon' <RoyceConlon@pdceng.com>, "'PatrickCotter@pdceng.com'" <'PatrickCotter@pdceng.com'>, "Kowalczyk, Thomas J (DOT)" <tom.kowalczyk@alaska.gov>, "Anderson, Ryan (DOT)" <ryan.anderson@alaska.gov>, "Demattio, Cristina M (DOT)" <cristina.demattio@alaska.gov>, "'a.brooks@brooks-alaska.com'" <a.brooks@brooks-alaska.com>, "'patricia.sullivan@faa.gov'" <'patricia.sullivan@faa.gov'>, "Schreier, Tammi L (DOT)" <tammi.schreier@alaska.gov>, "Moneymaker, Karen A (DOT)" <karen.moneymaker@alaska.gov>, Matthew Freeman/AAL/FAA@FAA, "Blankenship, Hannah J (DOT)" <hannah.blankenship@alaska.gov>, "Maggard, Roger K (DOT)" <roger.maggard@alaska.gov>, "Schultz, Andrew M (DOT)" <andrew.schultz@alaska.gov>, "Walton, Jerry R (MVA)" <jerry.walton@alaska.gov>, Pat Oien/AAL/FAA@FAA, 'Patrick Cotter' <PatrickCotter@pdceng.com>, Patricia Sullivan/AAL/FAA@FAA, "Karner, Scott W (MVA)" <scott.karner@alaska.gov>, Bruce Greenwood/AAL/FAA@FAA

Cc: "Chapman, Judy (DOT)" <judy.chapman@alaska.gov>, "Hatter, Steve D (DOT)" <steve.hatter@alaska.gov>

Date: 08/08/2013 09:33 AM

Subject: FW: BRW forecast

You have received a secure E-Mail

Read your secure e-mail by opening the above attachment, securedoc.html. You will be prompted to open (view) the file or save (download) it to your computer. For best results, save the file first, then open it in a Web browser. To access from a mobile device, forward this message to mobile@res.cisco.com to receive a mobile login URL.

If you have concerns about the validity of this message, contact the sender directly.

First time users - will need to register after opening the attachment.
Help - https://securemail.alaska.gov/websafe/help?topic=RegEnvelope **About IronPort Encryption -** https://securemail.alaska.gov/websafe/about

[attachment "securedoc.html" deleted by Pat Oien/AAL/FAA] [attachment "Ch3_Forecast_DRAFT_revised_13y08m14d.pdf" deleted by Pat Oien/AAL/FAA]

APPENDIX B

Facility Requirements

Contents

Safety Alert for Operators 06012

SAFO

Safety Alert for Operators

U.S. Department
of Transportation
Federal Aviation Administration

SAFO 06012
DATE: 8/31/06

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest.

Subject: Landing Performance Assessments at Time of Arrival (Turbojets)

1. Purpose. This SAFO urgently recommends that operators of turbojet airplanes develop procedures for flightcrews to assess landing performance based on conditions actually existing at time of arrival, as distinct from conditions presumed at time of dispatch. Those conditions include weather, runway conditions, the airplane's weight, and braking systems to be used. Once the actual landing distance is determined an additional safety margin of at least 15% should be added to that distance. Except under emergency conditions flightcrews should not attempt to land on runways that do not meet the assessment criteria and safety margins as specified in this SAFO.

2. Discussion: This SAFO is based on the FAA's policy statement published in the Federal Register on June 7, 2006, and incorporates revisions based on public comments received by the FAA. Accordingly, the FAA has undertaken rulemaking that would explicitly require the practice described above. Operators may use Operation/Management Specification paragraph C382 to record their voluntary commitment to this practice, pending rulemaking.

> **Operators engaged in air transportation have a statutory obligation to operate with the highest possible degree of safety in the public interest.**

3. Applicability:

a. This SAFO applies to all turbojet operators under Title 14 of the Code of Federal Regulations (14 CFR) parts 121, 135, 125, and 91 subpart K. The intent of providing this information is to assist operators in developing methods of ensuring that sufficient landing distance exists to safely make a full stop landing with an acceptable safety margin on the runway to be used, in the conditions existing at the time of arrival, and with the deceleration means and airplane configuration that will be used. The FAA considers a 15% margin between the expected actual airplane landing distance and the landing distance available at the time of arrival as the minimum acceptable safety margin for normal operations.

b. The FAA acknowledges that there are situations where the flightcrew needs to know the absolute performance capability of the airplane. These situations include emergencies or abnormal and irregular configurations of the airplane such as engine failure or flight control malfunctions. In these circumstances, the pilot must consider whether it is safer to remain in the air or to land immediately and must know the actual landing performance capability (without an added safety margin) when making these evaluations. This guidance is not intended to curtail such evaluations from being made for these situations.

c. This guidance is independent of the preflight landing distance planning requirements of part 121, section 121.195, part 135, section 135.385, and part 91, section 91.1037.

d. This 15% safety margin should not be applied to the landing distance determined for compliance with any other OpSpec/MSpec requirement. The landing distance assessment of this guidance is independent of any other OpSpec/MSpec landing distance requirement. The minimum landing distance should comply with all applicable landing distance requirements. Hence, the minimum landing distance at the time of arrival should be the longer of the landing distance in this guidance and that determined to be in compliance with any other applicable OpSpec/MSpec.

e. This guidance does not apply to Land and Hold Short Operations (LAHSO).

4. Definitions: The following definitions are specific to this guidance and may differ with those definitions contained in other published references.

a. Actual Landing Distance. The landing distance for the reported meteorological and runway surface conditions, runway slope, airplane weight, airplane configuration, approach speed, use of autoland or a Head-up Guidance System, and ground deceleration devices planned to be used for the landing. It does not include any safety margin and represents the best performance the airplane is capable of for the conditions.

b. Airplane Ground Deceleration Devices. Any device used to aid in the onset or rate of airplane deceleration on the ground during the landing roll out. These would include, but not be limited to: brakes (either manual braking or the use of autobrakes), spoilers, and thrust reversers.

c. At Time of Arrival. For the purpose of this guidance means a point in time as close to the airport as possible consistent with the ability to obtain the most current meteorological and runway surface conditions considering pilot workload and traffic surveillance, but no later than the commencement of the approach procedures or visual approach pattern.

d. Braking Action Reports. The following braking action reports are widely used in the aviation industry and are furnished by air traffic controllers when available. The definitions provided below are consistent with how these terms are used in this guidance.

Good – More braking capability is available than is used in typical deceleration on a non-limiting runway (i.e., a runway with additional stopping distance available). However, the landing distance will be longer than the certified (unfactored) dry runway landing distance, even with a well executed landing and maximum effort braking.

Fair/Medium – Noticeably degraded braking conditions. Expect and plan for a longer stopping distance such as might be expected on a packed or compacted snow-covered runway.

Poor – Very degraded braking conditions with a potential for hydroplaning. Expect and plan for a significantly longer stopping distance such as might be expected on an ice-covered runway.

Nil – No braking action and poor directional control can be expected.

NOTE: Conditions specified as "nil" braking action are not considered safe, therefore operations under conditions specified as such should not be conducted. Do not attempt to operate on surfaces reported or expected to have nil braking action.

e. Factored Landing Distance. The landing distance required by 14 CFR part 25, section 25.125 increased by the preflight planning safety margin additives required by the applicable operating rules. (Some manufacturers supply factored landing distance information in the Airplane Flight Manual (AFM) as a service to the user.)

f. Landing Distance Available. The length of the runway declared available for landing. This distance may be shorter than the full length of the runway.

g. Meteorological Conditions. Any meteorological condition that may affect either the air or ground portions of the landing distance. Examples may include wind direction and velocity, pressure altitude, and temperature. An example of a possible effect that must be considered includes crosswinds affecting the amount of reverse thrust that can be used on airplanes with tail mounted engines due to rudder blanking effects.

h. Reliable Braking Action Report. For the purpose of this guidance, means a braking action report submitted from a turbojet airplane with landing performance capabilities similar to those of the airplane being operated.

i. Runway Surface Conditions. The state of the surface of the runway: either dry, wet, or contaminated. A dry runway is one that is clear of contaminants and visible moisture within the required length and the width being used. A wet runway is one that is neither dry nor contaminated. For a contaminated runway, the runway surface conditions include the type and depth (if applicable) of the substance on the runway surface, e.g., standing water, dry snow, wet snow, slush, ice, sanded, or chemically treated.

j. Runway Friction or Runway Friction Coefficient. The resistance to movement of an object moving on the runway surface as measured by a runway friction measuring device. The resistive force resulting from the runway friction coefficient is the product of the runway friction coefficient and the weight of the object.

k. Runway Friction Enhancing Substance. Any substance that increases the runway friction value.

l. Safety Margin. The length of runway available beyond the actual landing distance. Safety margin can be expressed in a fixed distance increment or a percentage increase beyond the actual landing distance required.

m. Unfactored Certified Landing Distance. The landing distance required by section 25.125 without any safety margin additives. The unfactored certified landing distance may be different from the actual landing distance because not all factors affecting landing distance are required to be accounted for by section 25.125. For example, the unfactored certified landing distances are based on a dry, level (zero slope) runway at standard day temperatures, and do not take into account the use of autobrakes, autoland systems, head-up guidance systems, or thrust reversers.

5. Background: After any serious aircraft accident or incident, the FAA typically performs an internal audit to evaluate the adequacy of current regulations and guidance information in areas that come under scrutiny during the course of the accident investigation. The Southwest Airlines landing overrun accident involving a Boeing 737-700 at Chicago Midway Airport in December 2005 initiated such an audit. The types of information that were evaluated in addition to the regulations were FAA orders, notices, advisory circulars, ICAO and foreign country requirements, airplane manufacturer-developed material, independent source material, and the current practices of air carrier operators. This internal FAA review revealed the following issues:

a. A survey of operators' manuals indicated that approximately fifty percent of the operators surveyed do not have policies in place for assessing whether sufficient landing distance exists at the time of arrival, even when conditions (including runway, meteorological, surface, airplane weight, airplane configuration, and planned usage of decelerating devices) are different and worse than those planned at the time the flight was released.

b. Not all operators who perform landing distance assessments at the time of arrival have procedures that account for runway surface conditions or reduced braking action reports.

c. Many operators who perform landing distance assessments at the time of arrival do not apply a safety margin to the expected actual landing distance. Those that do are inconsistent in applying an increasing safety margin as the expected actual landing distance increased (i.e., as a percentage of the expected actual landing distance).

d. Some operators have developed their own contaminated runway landing performance data or are using data developed by third party vendors. In some cases, these data indicate shorter landing distances than the airplane manufacturer's data for the same conditions. In other cases, an autobrake landing distance chart has been misused to generate landing performance data for contaminated runway conditions. Also, some operators' data have not been kept up to date with the manufacturer's current data.

e. Credit for the use of thrust reversers in the landing performance data is not uniformly applied and pilots may be unaware of these differences. In one case, there were differences found within the same operator from one series of airplane to another within the same make and model. The operator's understanding of the data with respect to reverse thrust credit, and the information conveyed to pilots, were both incorrect.

f. Airplane flight manual (AFM) landing performance data are determined during flight-testing using flight test and analysis criteria that are not representative of everyday operational practices. Landing distances determined in compliance with 14 CFR part 25, section 25.125 and published in the FAA-approved AFM do not reflect operational landing distances (Note: some manufacturers provide factored landing distance data that addresses operational requirements.) Landing distances determined during certification tests are aimed at demonstrating the shortest landing distances for a given airplane weight with a test pilot at the controls and are established with full awareness that operational rules for normal operations require additional factors to be added for determining minimum operational field lengths. Flight test and data analysis techniques for determining landing distances can result in the use of high touchdown sink rates (as high as 8 feet per second) and approach angles of -3.5 degrees to minimize the airborne portion of the landing distance. Maximum manual braking, initiated as soon as possible after landing, is used in order to minimize the braking portion of the landing distance. Therefore, the landing distances determined under section 25.125 are shorter than the landing distances achieved in normal operations.

g. Wet and contaminated runway landing distance data are usually an analytical computation using the dry, smooth, hard surface runway data collected during certification. Therefore, the wet and contaminated runway data may not represent performance that would be achieved in normal operations. This lack of operational landing performance repeatability from the flight test data, along with many other variables affecting landing distance, are taken into consideration in the preflight landing performance calculations by requiring a significant safety margin in excess of the certified (unfactored) landing distance that would be required under those conditions. However, the regulations do not specify a particular safety margin for a landing distance assessment at the time of arrival. This safety margin has been left largely to the operator and/or the flightcrew to determine.

h. Manufacturers do not provide advisory landing distance information in a standardized manner. However, most turbojet manufacturers make landing distance performance information available for a range of runway or braking action conditions using various airplane deceleration devices and settings under a variety of meteorological conditions. This information is made available in a wide variety of informational documents, dependent upon the manufacturer.

i. Manufacturer-supplied landing performance data for conditions worse than a dry, smooth runway is normally an analytical computation based on the dry runway landing performance data, adjusted for a reduced airplane braking coefficient of friction available for the specific runway surface condition. Most of the data for runways contaminated by snow, slush, standing water, or ice were developed to show compliance with European Aviation Safety Agency and Joint Aviation Authority airworthiness certification and operating requirements. The FAA considers the data developed for showing compliance with the European contaminated runway certification or operating requirements, as applicable, to be acceptable for making landing distance assessments for contaminated runways at the time of arrival.

6. Recommended Action:

a. A review of the current applicable regulations indicates that the regulations do not specify the type of landing distance assessment that must be performed at the time of arrival, but operators are required to restrict or suspend operations when conditions are hazardous.

b. 14 CFR part 121, section 121.195(b), part 135, section 135.385(b), and part 91, section 91.1037(b) and (c) require operators to comply with certain landing distance requirements at the time of takeoff. (14 CFR part 125, section 125.49 requires operators to use airports that are adequate for the proposed operation). These requirements limit the allowable takeoff weight to that which would allow the airplane to land within a specified percentage of the landing distance available on: (1) the most favorable runway at the destination airport under still air conditions;

and (2) the most suitable runway in the expected wind conditions. Sections 121.195(d), 135.385(d), and 91.1037(e) further require an additional 15 percent to be added to the landing distance required when the runway is wet or slippery, unless a shorter distance can be shown using operational landing techniques on wet runways. Although an airplane can be legally dispatched under these conditions, compliance with these requirements alone does not ensure that the airplane can safely land within the distance available on the runway actually used for landing in the conditions that exist at the time of arrival, particularly if the runway, runway surface condition, meteorological conditions, airplane configuration, airplane weight, or use of airplane ground deceleration devices is different than that used in the preflight calculation. Part 121, sections 121.533, 121.535, 121.537, part 135, section 135.77, part 125, section 125.351, and part 91, sections 91.3, and 91.1009 place the responsibility for the safe operation of the flight jointly with the operator, pilot in command, and dispatcher as appropriate to the type of operation being conducted.

c. Sections 121.195(e) and 135.385(e), allow an airplane to depart even when it is unable to comply with the conditions referred to in item (2) of paragraph 5b above if an alternate airport is specified where the airplane can comply with conditions referred to in items (1) and (2) of paragraph 5b. This implies that a landing distance assessment is accomplished before landing to determine if it is safe to land at the destination, or if a diversion to an alternate airport is required.

d. Part 121, sections 121.601 and 121.603, require dispatchers to keep pilots informed, or for pilots to stay informed as applicable, of conditions, such as airport and meteorological conditions, that may affect the safety of the flight. Thus, the operator and flightcrew use this information in their safety of flight decision making. Part 121, sections 121.551, 121.553, and part 135, section 135.69, require an operator, and/or the pilot in command as applicable, to restrict or suspend operations to an airport if the conditions, including airport or runway surface conditions, are hazardous to safe operations. Part 125 section 125.371 prohibits a pilot in command (PIC) from continuing toward any airport to which it was released unless the flight can be completed safely. A landing distance assessment should be made under the conditions existing at the time of arrival in order to support a determination of whether conditions exist that may affect the safety of the flight and whether operations should be restricted or suspended.

e. Runway surface conditions may be reported using several types of descriptive terms including: type and depth of contamination, a reading from a runway friction measuring device, an airplane braking action report, or an airport vehicle braking condition report. Unfortunately, joint industry and multi-national government tests have not established a reliable correlation between runway friction under varying conditions, type of runway contaminants, braking action reports, and airplane braking capability. Extensive testing has been conducted in an effort to find a direct correlation between runway friction measurement device readings and airplane braking friction capability. However, these tests have not produced conclusive results that indicate a repeatable correlation exists through the full spectrum of runway contaminant conditions. Therefore, operators and flightcrews cannot base the calculation of landing distance solely on runway friction meter readings. Likewise, because pilot braking action reports are subjective, flightcrews must use sound judgment in using them to predict the stopping capability of their airplane. For example, the pilots of two identical aircraft landing in the same conditions, on the same runway could give different braking action reports. These differing reports could be the result of differences between the specific aircraft, aircraft weight, pilot technique, pilot experience in similar conditions, pilot total experience, and pilot expectations. Also, runway surface conditions can degrade or improve significantly in very short periods of time dependent on precipitation, temperature, usage, and runway treatment and could be significantly different than indicated by the last report. Flightcrews must consider all available information, including runway surface condition reports, braking action reports, and friction measurements.

(1) Operators and pilots should use the most adverse reliable braking action report, if available, or the most adverse expected conditions for the runway, or portion of the runway, that will be used for landing when assessing the required landing distance prior to landing. Operators and pilots should consider the following factors in determining the actual landing distance: the age of the report, meteorological conditions present since the report was issued, type of airplane or device used to obtain the report, whether the runway surface was treated since the report, and the methods used for that treatment. Operators and pilots are expected to use sound judgment in determining the applicability of this information to their airplane's landing performance.

(2) Table 1 provides an example of a correlation between braking action reports and runway surface conditions:

Braking Action	Dry (not reported)	Good	Fair/Medium	Poor	Nil
Contaminant	Dry	Wet Dry Snow (< 20mm)	Packed or Compacted Snow	Wet Snow Slush Standing Water Ice	Wet ice

Table 1. Relationship between braking action reports and runway surface condition (contaminant type)

NOTE: Under extremely cold temperatures, these relationships may be less reliable and braking capabilities may be better than represented. This table does not include any information pertaining to a runway that has been chemically treated or where a runway friction enhancing substance has been applied.

f. Some advisory landing distance information uses a standard air distance of 1000 feet from 50 feet above the runway threshold to the touchdown point. Unfactored dry runway landing distances in AFMs reflect the distances demonstrated during certification flight testing. These unfactored AFM landing distance data include air distances that vary with airplane weight, but are also nominally around 1000 feet. A 1000 foot air distance is not consistently achievable in normal flight operations. Additionally, the use of automatic landing systems (autoland) and other landing guidance systems (e.g., head-up guidance systems) typically result in longer air distances. Operators are expected to apply adjustments to this air distances to reflect their specific operations, operational practices, procedures, training, and experience.

g. To ensure that an acceptable landing distance safety margin exists at the time of arrival, the FAA recommends that at least a 15% safety margin be provided. This safety margin represents the minimum distance margin that must exist between the expected actual landing distance at the time of arrival and the landing distance available, considering the meteorological and runway surface conditions, airplane configuration and weight, and the intended use of airplane ground deceleration devices. In other words, the landing distance available on the runway to be used for landing must allow a full stop landing, in the actual conditions and airplane configuration at the time of landing, and at least an additional 15% safety margin.

h. Operator compliance can be accomplished by a variety of methods and procedurally should be accomplished by the method that best suits the operator's current procedures. The operator's procedures should be clearly articulated in the operations manual system for affected personnel. The following list of methods is not all inclusive, or an endorsement of any particular methods, but provided as only some examples of methods of compliance.

- Establishment of a minimum runway length required under the worst case meteorological and runway surface conditions for operator's total fleet or fleet type that will provide runway lengths that comply with this guidance.

- The requirements of this paragraph could be considered along with the other applicable preflight landing distance calculation requirements and the takeoff weight adjusted to provide for compliance at the time of arrival under the conditions and configurations factored in the calculation. This information, including the conditions/configurations/etc. used in the calculation, would be provided to the flightcrew as part of the release/dispatch documents. (However, this method may not be sufficient if conditions/configurations/etc. at the time of arrival are different than those taken into account in the preflight calculations; therefore, the flightcrew would need to have access to the landing performance data applicable to the conditions present upon arrival.

- Tab or graphical data accounting for the applicable variables provided to the flightcrew and/or dispatcher as appropriate to the operator's procedures.

- Electronic Flight Bag equipment that has methods for accounting for the appropriate variables.

  NOTE: These are only some examples of methods of compliance. There are many others that would be acceptable.

7. Summary of Recommendation.

a. Turbojet operators have procedures to ensure that a full stop landing, with at least a 15% safety margin beyond the actual landing distance, can be made on the runway to be used, in the conditions existing at the time of arrival, and with the deceleration means and airplane configuration that will be used. This assessment should take into account the meteorological conditions affecting landing performance (airport pressure altitude, wind velocity, wind direction, etc.), surface condition of the runway to be used for landing, the approach speed, airplane weight and configuration, and planned use of airplane ground deceleration devices. The airborne portion of the actual landing distance (distance from runway threshold to touchdown point) should reflect the operator's specific operations, operational practices, procedures, training, and experience. Operators should have procedures for compliance with this guidance, absent an emergency, after the flightcrew makes this assessment using the air carrier's procedures, if at least the 15% safety margin is not available, the pilot should not land the aircraft.

(1) This assessment does not mean that a specific calculation must be made before every landing. In many cases, the before takeoff criteria, with their large safety margins, will be adequate to ensure that there is sufficient landing distance with at least a 15% safety margin at the time of arrival. Only when the conditions at the destination airport deteriorate while en route (e.g., runway surface condition, runway to be used, winds, airplane landing weight/configuration/speed/deceleration devices) or the takeoff was conducted under the provisions described in paragraph 5 (c) of this guidance, would a calculation or other method of determining the actual landing distance capability normally be needed. The operator should develop procedures to determine when such a calculation or other method of determining the expected actual landing distance is necessary to ensure that at least a 15% safety margin will exist at the time of arrival.

(2) Operators may require flight crews to perform this assessment, or may establish other procedures to conduct this assessment. Whatever method(s) the operator develops, its procedures should account for all factors upon which the preflight planning was based and the actual conditions existing at time of arrival.

b. Confirm that the procedures and data used to comply with paragraph 6 (a) above for actual landing performance assessments yield results that are at least as conservative as the manufacturer's approved or advisory information for the associated conditions provided therein. Although the European contaminated runway operations requirements are applied differently than the requirements of this guidance, the operator may choose to use data developed for showing compliance with the European contaminated runway operating requirements for making these landing distance assessments for contaminated runways at the time of arrival.

c. A safety margin of 15% should be added to the actual landing distance and require that the resulting distance be within the landing distance available of the runway used for landing. Note that the FAA considers a 15% margin to be the minimum acceptable safety margin.

d. If wet or contaminated runway landing distance data are unavailable, the factors in Table 2 should be applied to the pre-flight planning (factored) dry runway landing distances determined in accordance with the applicable operating rule (e.g., sections 91.1037, 121.195(b) or 135.385(b). Table 2 should only apply when no such data are available. The factors in Table 2 include the 15% safety margin recommended by this guidance, and are considered to include an air distance representative of normal operational practices. Therefore, operators do not need to apply further adjustments to the resulting distances to comply with the recommendations of this guidance.

Runway Condition	Reported Braking Action	Factor to apply to (factored) dry runway landing distance*
Wet Runway, Dry Snow	Good	0.9
Packed or Compacted Snow	Fair/Medium	1.2
Wet snow, slush, standing water, ice	Poor	1.6
Wet ice	Nil	Landing is prohibited

Table 2. Multiplication factors to apply to the factored dry runway landing distances when the data for the specified runway condition are unavailable.

* The factored dry runway landing distances for use with Table 2 must be based on landing within a distance of 60% of the effective length of the runway, even for operations where the preflight planning (factored) dry runway landing distances are based on landing within a distance other than 60% of the effective length of the runway (e.g., certain operations under part 135 and subpart K of par t91). To use unfactored dry runway landing distances, first multiply the unfactored dry runway landing distance by 1.667 to get the factored dry runway landing distance before entering Table 2 above.

> **NOTE: These factors assume maximum manual braking, autospoilers (if so equipped), and reverse thrust will be used. For operations without reverse thrust (or without credit for the use of reverse thrust) multiply the results of the factors in Table 2 by 1.2. These factors cannot be used to assess landing distance requirements with autobrakes.**

e. The landing distance assessment should be accomplished as close to the time of arrival as practicable, taking into account workload considerations during critical phases of flight, using the most up-to-date information available at that time. The most adverse braking condition, based on reliable braking reports or runway contaminant reports (or expected runway surface conditions if no reports are available) for the portion of the runway that will be used for the landing should be used in the actual landing performance assessment. For example, if the runway surface condition is reported as fair to poor, or fair in the middle, but poor at the ends, the runway surface condition should be assumed to be poor for the assessment of the actual landing distance. (This example assumes the entire runway will be used for the landing). If conditions change between the time that the assessment is made and the time of landing, the flightcrew should consider whether it would be safer to continue the landing or reassess the landing distance.

f. The operator’s flightcrew and dispatcher training programs should include elements that provide knowledge in all aspects and assumptions used in landing distance performance determinations. This training should emphasize the airplane ground deceleration devices, settings, and piloting methods (e.g., air distance) used in determining landing distances for each make, model, and series of airplane. Elements such as braking action reports, airplane configuration, optimal stopping performance techniques, stopping margin, the effects of excess speed, delays in activating deceleration devices, and other pilot performance techniques should be covered. All dispatchers and flightcrew members should be trained on these elements prior to operations on contaminated runway surfaces. This training should be accomplished in a manner consistent with the operator’s methods for conveying similar knowledge to flight operations personnel. It may be conducted via operations/training bulletins or extended learning systems, if applicable to the operator's current methods of training.

g. Procedures for obtaining optimal stopping performance on contaminated runways should be included in flight training programs. All flight crewmembers should be made aware of these procedures for the make/model/series of airplane they operate. This training should be accomplished in a manner consistent with the operator's methods for conveying similar knowledge to flight operations personnel. It may be conducted via operations/training bulletins or extended learning systems, if applicable to the operator's current methods of training. In addition, if not already included, these procedures should be incorporated into each airplane or simulator training curriculum for initial qualification on the make/model/series airplane, or differences training as appropriate. All flight crewmembers should have hands on training and validate proficiency in these procedures during their next flight training event, unless previously demonstrated with their current employer in that make/model/series of airplane.

Safety Alert for Operators 08003

SAFO

Safety Alert for Operators

U.S. Department
of Transportation

**Federal Aviation
Administration**

SAFO 08003
DATE 1/17/08

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

Subject: Guidance Material for Contaminated Runway Landing Operations

Purpose: This SAFO identifies Federal Aviation Administration (FAA) published guidance material that all operators are encouraged to incorporate into their standard operating procedures (SOP) to mitigate the risk of landing operations on contaminated runways.

Background: The aviation industry continues to experience accidents and incidents associated with landing operations on contaminated runways. These events are seldom caused by one factor but are typically the result of several combined factors that lead to the accident or incident. Some of the elements that have been identified as causal factors in these runway overrun events are:

- Misunderstanding or lack of knowledge of the stopping performance capability of the aircraft on contaminated runways and the assumptions that are built into landing performance data, both normal and advisory, as supplied in Aircraft Flight Manuals (AFM) and associated documentation.
- Landing long**—**Basing landing distance requirements on AFM data but landing farther down the runway than would be assumed by the AFM landing data.
- Approach and landing speeds higher than those specified by the AFM.
- A different approach angle from that used during certification.
- The effect on landing distance caused by techniques used with brakes, thrust (prop) reversers, and aircraft ground lift dumping and drag devices that differ from those used during certification.
- Insufficient flightcrew training for planning and execution of landings on contaminated runways.

Discussion: In cooperation with industry, the FAA has produced and published the following two guidance documents that operators are encouraged to incorporate into their SOP for all landing operations with special emphasis for landing operations on contaminated runways. For your convenience, hyperlinks to the documents are included in the titles below.

Approved by: AFS-200

- SAFO 06012 Landing Performance Assessments at Time of Arrival (Turbojets), which can be found at http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo/all_safos/media/2006/safo06012.pdf
- Advisory Circular (AC) 91-79, Runway Overrun Prevention, which can be found at http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/0052F2A2A00D91B28625738E0071E44C?OpenDocument

Recommended Action: Directors of safety, directors of operations, aviation instructors, those responsible for operational control, and flight crewmembers should become familiar with the safety recommendations provided in these two documents and incorporate them into their SOP. Air carriers and air operators should incorporate the safety elements of these two documents into their operating procedures. Training programs should incorporate training for appropriate personnel to acquire the necessary knowledge and skill required to put the safety elements identified in these two documents into everyday operational practice.

Contact: AFS-220 at (202) 493-4602

Alaska Airlines Presentation – TALPA ARC Matrix Validation

TALPA ARC Matrix Validation
Industry Perspective

Chet Collett

Manager - Flight Standards
Alaska Airlines

Topics

- Takeoff And Landing Performance Assessment Aviation Rulemaking Committee (TALPA ARC) Background
- Scope of TALPA ARC Effort
- Runway Surface Condition Reporting
- Runway Surface Condition Matrix
- Matrix Validation - Industry Perspective

TALPA ARC Background

- Following the 8 December 2005 landing overrun of a Southwest Airlines Boeing 737-700 at Chicago's Midway Airport, FAA established an internal team to review related FAA regulations and policies as well as industry practices
- The team found deficiencies in several areas, most notably in the lack of a standard and accurate means to assess runway surface conditions to determine landing performance at the time of arrival
- As a result, on 31 August 2006, the FAA published Safety Alert for Operators (SAFO) 06012, "Landing Assessments at Time of Arrival (Turbojets)" to provide guidance for the operational aspect of contaminated runway landings
- The FAA formed the Takeoff and Landing Performance Assessment (TALPA) Aviation Rulemaking Committee (ARC) to provide recommendations for rulemaking to address the identified safety risk

TALPA ARC Participants

Regulatory Authorities

- FAA (Airports, Flight Standards, Certification, NOTAMS, Rulemaking, Legal)
- Transport Canada
- Brazilian Certification Authority
- EASA (Limited Participation)

Other Organizations

- Air Transport Association
- Airline Pilots Association
- Airports Council International
- Allied Pilots Association
- National Air Carrier Association
- National Business Aviation Association
- National Transportation Safety Board
- Neubert Aero Corporation
- Regional Airline Association
- Southwest Airlines Pilot Association
- Allied Pilots Association

Airplane Operators

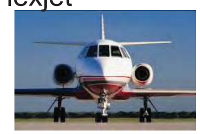
Part 121

- ABX Air
- Alaska
- American Eagle
- American
- Continental
- Delta
- Express Jet
- Federal Express
- Northwest
- Pinnacle
- Southwest
- United
- UPS
- US Airways

Airplane Operators

Part 91-K/125/135

- Alpha Flying, Inc
- Bombardier Flexjet
- Chantilly Air
- Flight Works
- Jet Solutions
- Conoco Phillips Alaska
- Net Jets
- Pogo Jet, Inc



Airports

- Cherry Capital
- Chicago Airport System
- Chicago O'Hare
- Grand Rapids Regional
- Minneapolis/St. Paul Airport System

Airplane Manufacturers

- Airbus
- Boeing
- Bombardier
- Cessna
- Eclipse
- Embraer
- Gulfstream
- Hawker

A Common Language

- **It quickly became apparent that the chain was broken and that a common runway surface condition description was needed between:**
  - Those who report the conditions (Airports)
  - Those who transmit the information (NOTAMS, Air Traffic)
  - Those who provide airplane performance data (Manufacturers)
  - Those who use the runway surface condition and airplane performance data to assess landing performance capability (Flightcrew and dispatchers)
- **Reviewed existing ICAO, EASA/JAA, FAA terms/methods**

Current Runway Surface Condition Information

- Runway Friction Measuring Devices, μ (or Mu) Reports
- Pilot Braking Action Reports
- Runway Surface Contamination Description (Type and Depth of Contamination)

Problem With Using μ For Takeoff and Landing Performance Assessments

- **Limited runway surface conditions for which they are applicable**
  - Conditions rarely exist during winter storm events for use of the devices
  - Often used and reported outside of device manufacturers' limitations for their use
- **Lack of repeatable results with same type of measuring device, or same device with consecutive measuring runs**
- **Device calibration concerns and procedures**
- **No operationally usable correlation between the different devices**
- **FAA concern of operationally usable correlation between reported μ and aircraft stopping performance**

Problem With Using Pilot Braking Action Reports

- **Subjective**
  - No standard definition of the pilot braking action reporting terms
  - No training or guidance given to pilots on how or when to report braking action
- **Until first aircraft lands and provides report no information is available**
- **Unknown correlation of reports between different airplane types**
- **Most airplane manufacturers do not provide performance data in terms of pilot braking action**
- **Nevertheless, in many cases overrun accident analysis has shown pilot reports to often be more accurate than other forms of runway surface condition information**

Problem With Using Runway Surface Contamination Descriptions (Type and Depth of Contamination)

- **Typically only available through NOTAM information**
- **Not updated in a timely manner**
- **Varying terms and definitions**
  - Patchy
  - Thin
  - Sanded
  - Dry snow vs. Wet snow
  - Wet snow vs. Slush
- **How to accurately measure depth?**
  - Significant airplane performance differences between 1/8” and 1/4” of slush, wet snow or dry snow

Runway Surface Condition Reporting

TALPA ARC Recommendation:

- **Use a combination of the best attributes of each method**
- **Improvements to address known deficiencies**
- **Beta test proposed method**
  - Currently in progress
- **Continue researching improved methods**

Runway Surface Condition Matrix

- Aligns runway surface conditions reported by airport operators to contaminated landing performance data supplied by the airplane manufacturer
- Provides a shorthand method of relaying runway surface condition information to flightcrews through the use of runway condition codes to replace the reporting of μ readings to flightcrews
- Provides for a standardized method of reporting runway surface conditions for all airports
- Will provide more detailed information for the flightcrew to make operational decisions
- Standardized pilot braking action report terminology
- Is not perfect, based on the best information available today and a significant improvement over current practices

Pilot Version of Matrix

Braking Action Report PIREPs		Associated Runway Surface Condition	Runway Condition Code
Term	**Definition**		
Dry	-	**Any temperature:** ▪Dry	**6**
Good	Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	**Any temperature of:** ▪Wet surface (Smooth, Grooved, or PFC runway) ▪Frost **Any temperature of: 1/8" or less of:** ▪Water ▪Slush ▪Dry Snow ▪Wet Snow	**5**
Good to Medium	Brake deceleration and controllability is between Good and Medium.	**At or below -13ºC:** • Compacted Snow	**4**
Medium	Braking deceleration is noticeably reduced for the wheel braking effort applied. Directional control may be slightly reduced.	**Any temperature when:** ▪Wet (When runway is reported as "slippery when wet") **At or below -3°C, and Greater than 1/8" of :** ▪Dry or Wet Snow **Above -13°C and at or below -3°C:** ▪Compacted Snow (Any depth, depth not reported)	**3**
Medium to Poor	Brake deceleration and controllability is between Medium and Poor. Potential for hydroplaning exists.	**Any Temperature, and Greater than 1/8" of:** ▪Water ▪Slush **Temperature Above -3°C and:** ▪1/8" and Greater of Dry or Wet Snow ▪Compacted Snow (Any depth, depth not reported)	**2**
Poor	Braking deceleration is significantly reduced for the wheel braking effort applied. Directional control may be significantly reduced.	**At or below -3°C:** • Ice	**1**
Nil	Braking deceleration is minimal to non-existent for the wheel braking effort applied. Directional control may be uncertain.	**Any temperature of:** ▪Wet Ice ▪Water on top of Compacted Snow ▪Dry or Wet Snow over Ice **Temperature Above -3°C:** Ice	**0** 12

Runway Surface Condition

Braking Action Report PIREPs		Associated Runway Surface Condition	Runway Condition Code
Term	Definition		
Dry	-	**Any temperature:** ▪Dry	6
Good	Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	**Any temperature of:** ▪Wet surface (Smooth, Grooved, or PFC runway) ▪Frost **Any temperature of: 1/8" or less of:** ▪Water ▪Slush ▪Dry Snow ▪Wet Snow	5
Good to Medium	Brake deceleration and controllability is between Good and Medium.	**At or below -13ºC:** • Compacted Snow	4
Medium	Braking deceleration is noticeably reduced for the wheel braking effort applied. Directional control may be slightly reduced.	**Any temperature when:** ▪Wet (When runway is reported as "slippery when wet") **At or below -3°C, and Greater than 1/8" of :** ▪Dry or Wet Snow **Above -13°C and at or below -3°C:** ▪Compacted Snow (Any depth, depth not reported)	3
Medium to Poor	Brake deceleration and controllability is between Medium and Poor. Potential for hydroplaning exists.	**Any Temperature, and Greater than 1/8" of:** ▪Water ▪Slush **Temperature Above -3°C and:** ▪1/8" and Greater of Dry or Wet Snow ▪Compacted Snow (Any depth, depth not reported)	2
Poor	Braking deceleration is significantly reduced for the wheel braking effort applied. Directional control may be significantly reduced.	**At or below -3°C:** • Ice	1
Nil	Braking deceleration is minimal to non-existent for the wheel braking effort applied. Directional control may be uncertain.	**Any temperature of:** ▪Wet Ice ▪Water on top of Compacted Snow ▪Dry or Wet Snow over Ice **Temperature Above -3°C:** Ice	0

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Runway Condition Codes

Braking Action Report PIREPs		Associated Runway Surface Condition	Runway Condition Code
Term	**Definition**		
Dry	-	**Any temperature:** ▪Dry	6
Good	Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	**Any temperature of:** ▪Wet surface (Smooth, Grooved, or PFC runway) ▪Frost **Any temperature of: 1/8" or less of:** ▪Water ▪Slush ▪Dry Snow ▪Wet Snow	5
Good to Medium	Brake deceleration and controllability is between Good and Medium.	**At or below -13ºC:** • Compacted Snow	4
Medium	Braking deceleration is noticeably reduced for the wheel braking effort applied. Directional control may be slightly reduced.	**Any temperature when:** ▪Wet (When runway is reported as "slippery when wet") **At or below -3°C, and Greater than 1/8" of :** ▪Dry or Wet Snow **Above -13°C and at or below -3°C:** ▪Compacted Snow (Any depth, depth not reported)	3
Medium to Poor	Brake deceleration and controllability is between Medium and Poor. Potential for hydroplaning exists.	**Any Temperature, and Greater than 1/8" of:** ▪Water ▪Slush **Temperature Above -3°C and:** ▪1/8" and Greater of Dry or Wet Snow ▪Compacted Snow (Any depth, depth not reported)	2
Poor	Braking deceleration is significantly reduced for the wheel braking effort applied. Directional control may be significantly reduced.	**At or below -3°C:** • Ice	1
Nil	Braking deceleration is minimal to non-existent for the wheel braking effort applied. Directional control may be uncertain.	**Any temperature of:** ▪Wet Ice ▪Water on top of Compacted Snow ▪Dry or Wet Snow over Ice **Temperature Above -3°C:** Ice	0 14

Braking Action Terms

Braking Action Report PIREPs		Associated Runway Surface Condition	Runway Condition Code
Term	**Definition**		
Dry	-	**Any temperature:** ▪Dry	**6**
Good	Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	**Any temperature of:** ▪Wet surface (Smooth, Grooved, or PFC runway) ▪Frost **Any temperature of: 1/8" or less of:** ▪Water ▪Slush ▪Dry Snow ▪Wet Snow	**5**
Good to Medium	Brake deceleration and controllability is between Good and Medium.	**At or below -13ºC:** • Compacted Snow	**4**
Medium	Braking deceleration is noticeably reduced for the wheel braking effort applied. Directional control may be slightly reduced.	**Any temperature when:** ▪Wet (When runway is reported as "slippery when wet") **At or below -3°C, and Greater than 1/8" of :** ▪Dry or Wet Snow **Above -13°C and at or below -3°C:** ▪Compacted Snow (Any depth, depth not reported)	**3**
Medium to Poor	Brake deceleration and controllability is between Medium and Poor. Potential for hydroplaning exists.	**Any Temperature, and Greater than 1/8" of:** ▪Water ▪Slush **Temperature Above -3°C and:** ▪1/8" and Greater of Dry or Wet Snow ▪Compacted Snow (Any depth, depth not reported)	**2**
Poor	Braking deceleration is significantly reduced for the wheel braking effort applied. Directional control may be significantly reduced.	**At or below -3°C:** • Ice	**1**
Nil	Braking deceleration is minimal to non-existent for the wheel braking effort applied. Directional control may be uncertain.	**Any temperature of:** ▪Wet Ice ▪Water on top of Compacted Snow ▪Dry or Wet Snow over Ice **Temperature Above -3°C:** Ice	**0**

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Braking Action Definitions

Braking Action Report PIREPs		Associated Runway Surface Condition	Runway Condition Code
Term	**Definition**		
Dry	-	**Any temperature:** ▪Dry	**6**
Good	Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	**Any temperature of:** ▪Wet surface (Smooth, Grooved, or PFC runway) ▪Frost **Any temperature of: 1/8" or less of:** ▪Water ▪Slush ▪Dry Snow ▪Wet Snow	**5**
Good to Medium	Brake deceleration and controllability is between Good and Medium.	**At or below -13ºC:** • Compacted Snow	**4**
Medium	Braking deceleration is noticeably reduced for the wheel braking effort applied. Directional control may be slightly reduced.	**Any temperature when:** ▪Wet (When runway is reported as "slippery when wet") **At or below -3°C, and Greater than 1/8" of :** ▪Dry or Wet Snow **Above -13°C and at or below -3°C:** ▪Compacted Snow (Any depth, depth not reported)	**3**
Medium to Poor	Brake deceleration and controllability is between Medium and Poor. Potential for hydroplaning exists.	**Any Temperature, and Greater than 1/8" of:** ▪Water ▪Slush **Temperature Above -3°C and:** ▪1/8" and Greater of Dry or Wet Snow ▪Compacted Snow (Any depth, depth not reported)	**2**
Poor	Braking deceleration is significantly reduced for the wheel braking effort applied. Directional control may be significantly reduced.	**At or below -3°C:** • Ice	**1**
Nil	Braking deceleration is minimal to non-existent for the wheel braking effort applied. Directional control may be uncertain.	**Any temperature of:** ▪Wet Ice ▪Water on top of Compacted Snow ▪Dry or Wet Snow over Ice **Temperature Above -3°C:** Ice	**0**

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Use of Runway Friction Measuring Device Readings, μ

- Only to be used by airport operator to further assess if the runway condition code should be downgraded from that associated with the contamination type, depth, and temperature.
- Cannot be used to upgrade runway condition code
- Not to be reported to flightcrews but remains one of the tools in the airport operators tool box for assessing runway surface conditions, and effectiveness of clearing actions taken

Airport Estimated Runway Condition Assessment				Pilot Reports (PIREPs) Provided To ATC And Flight Dispatch
Runway Condition Assessment – Reported		Downgrade Assessment Criteria		
Code	Runway Description	Mu (µ)	Deceleration And Directional Control Observation	PIREP
6	**Any temperature:** •Dry	-	-	Dry
5	**Any temperature of:** •Wet surface (Smooth, Grooved, or PFC runway) •Frost **Any temperature of: 1/8" or less of:** •Water •Slush •Dry Snow •Wet Snow	40µ or higher	Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	Good
4	**At or below -13°C:** • Compacted Snow	39-36µ	Brake deceleration and controllability is between Good and Medium.	Good to Medium
3	**Any temperature when:** •Wet (When runway is reported as "slippery when wet") **At or below -3°C, and Greater than 1/8" of :** •Dry or Wet Snow **Above -13°C and at or below -3°C:** •Compacted Snow (Any depth, depth not reported)	35-30µ	Braking deceleration is noticeably reduced for the wheel braking effort applied. Directional control may be slightly reduced.	Medium
2	**Any Temperature, and Greater than 1/8" of:** •Water •Slush **Temperature Above -3°C and:** •1/8" and Greater of Dry or Wet Snow •Compacted Snow (Any depth, depth not reported)	29-26µ	Brake deceleration and controllability is between Medium and Poor. Potential for hydroplaning exists.	Medium to Poor
1	**At or below -3°C:** • Ice	25-21µ	Braking deceleration is significantly reduced for the wheel braking effort applied. Directional control may be significantly reduced.	Poor
0	**Any temperature of:** •Wet Ice •Water on top of Compacted Snow •Dry or Wet Snow over Ice	20µ or lower	Braking deceleration is minimal to non-existent for the wheel braking effort applied. Directional control may	Nil

Proposed Many Changes To Runway Surface Conditions Reports (NOTAM)

- **Changes in terminology reported**
  - Discontinued use of “patchy”, “trace”, and “thin”
  - Use of contamination terminology consistent with AFM landing performance data
- **Contamination descriptions provided in terms of type and depth of contaminant and percentage of runway coverage**
- **Clear identification of runway and direction for which the report is applicable**
- **Report provided in thirds of the runway**
- **Runway condition code provided in thirds of runway length when any one third greater than 25% covered**

Proposed Many Changes To Runway Surface Conditions Reports (NOTAM) (continued)

Runway Condition and Contamination Terms (for reporting)

- Dry
- Wet (also report runway type – smooth, grooved, PFC, or slippery when wet)
- Water
- Slush
- Wet Snow
- Dry Snow
- Compacted Snow
- Frost
- Ice
- Wet Ice

Proposed Many Changes To Runway Surface Conditions Reports (NOTAM) (continued)

Contaminant Depths to be Reported

- 1/8 inch (3 mm)
- 1/4 inch (6 mm)
- 1/2 inch (13 mm)
- 3/4 inch (19 mm)
- 1 inch (25 mm)
- 2 inches (51 mm)
- 3 inches (76 mm)
- 4 inches (102 mm)

Proposed Many Changes To Runway Surface Conditions Reports (NOTAM) (continued)

Contaminant Coverage to be Reported

- 0 to 10% → 10%
- 11% to 25% → 25%
- 26% to 50% → 50%
- 51% to 75% → 75%
- 75% to 100% → 100%

Percentage Vs "Patchy"

Affect of various percentage of coverage on aircraft performance:

- 10% (10% or less) Does not require any Performance Penalties
- 25% (11% thru 25%) Does not require any Performance Penalties
- 50% (26% thru 50%) Treat as 100% for performance Calculations
- 75% (51% thru 75%) Treat as 100% for performance Calculations
- 100% (76% thru 100%) Treat as 100% for performance Calculations

CERT ALERT 09-13

….. Current guidance considers a "Patchy" condition to exist anytime the surface is covered by less than 100% of the contaminate. New airport surface condition reporting terminology is being developed by a joint FAA/Industry group. However until the new guidance is completed and published, the FAA is directing that only contaminate conditions that cover 25% or less of the cleared/treated/usable surface be classified as "Patchy." Conditions covering more than 25% should be considered as covering the total surface area for surface condition reporting purposes. This breakdown will match the breakdown provided to airplane operators by the aircraft manufacturers for performance on contaminated surfaces.

This is 25% coverage, and would not require a performance adjustment by the pilot.

When the runway is not cleared to its full width, the percent of coverage only applies to the part of the runway that has been treated/cleared.

In this case, this would still represent 25% coverage.

If the coverage is concentrated in one of the thirds of the runway, even though it is still 25% - We need to know about this.

This would be an example of where you would DOWNGRADE that third of the runway – RWY 26 6/6/3 25% Compact Snow (last third of the runway)

Matrix Evaluation

- Beta tested at two airports last winter (2008 – 2009)
- Matrix was slightly modified based on the results of last years limited evaluation
- Current Matrix a result of those modifications
- This Winter (2009-2010) conducted Matrix validation testing at 7 Airports in Alaska, and 3 in Great Lakes Region in coordination with Alaska Airlines and Pinnacle Airlines.

Goals Of Continued Beta Testing of Matrix Determine If:

- Is it usable for airport operators?
- Is it usable for flightcrews and flight operations personnel?
- Are the relationships of runway surface conditions, (type, depth, and temperature) representative of pilot observed braking action?

Alaska Airlines

- Alaska Airlines operates into some of the most challenging airports in the world.
- Alaska Airlines has been using the Matrix for the Pilot in flight analysis since 2006.
- This season we trained 7 airports in the State of Alaska to use the matrix and other tools to provide good data comparisons between their Runway Condition Assessment Report and our Pilot Braking Action Reports.


Alaska Airlines Training
• We Trained our pilots to do the in flight runway condition assessment analysis.
• Trained to land faithful to the data assumptions
• Used the 1000’ air run data with 15% safety margin.
• Trained our pilots to give good and reliable Pilot Braking Action Reports.

RUNWAY SURFACE CONDITION REPORT ASSESSMENT TABLE

This chart is used in conjunction with Degraded Runway Condition Assessment and Landing Restriction Policies found in the FOM and listed on the reverse. It is applicable system wide. When runway contamination is determined to cover 25% or less of the usable landing surface, braking action may be considered **GOOD**. **Captain is charged with using ALL available information in making final decision to land.**

	Dry	Wet		Contaminated											
Type	N/A	Any	Slippery When Wet[1]	Frost	Standing Water or Slush (WTR-SLR)		Wet Snow or Dry Snow (WSR-LSR)			Compacted Snow (SIR-PSR)			Ice (IR)		Wet Ice: Water Over SIR, PSR or IR **OR** Snow Over IR
Depth	N/A	N/A	N/A	N/A	**1/8" or less[2]**	**Greater than 1/8"[2]**	**1/8" or less[2]**	**Greater than 1/8"[2]**		Any	Any	Any	Any[3]	Any	Any
Temp	Any	Any	Any	Any	Any	Any	Any	**-3°C or Below**	**Above -3°C**	**-13°C or Below**	**Above -13°C at or Below -3°C**	**Above -3°C**	**-3°C or Below**	**Above -3°C**	Any
Rwy Code	6	5	3	5	5	2	5	3	2	4	3	2	1	0	0

Notam Code Notes:

PATCHY **(PTCHY)** is considered **GOOD** Braking Action (Code 5) if accompanied by Mu values of 40 or better.

Treat Sand **(SA)** or Sanded Snow **(SN)** descriptors as information only – take no credit.

1. Slippery When Wet used to indicate excess rubber deposits in touchdown zones.
2. THIN **(THN)** may be treated as 1/8 inch or less depth if accompanied by Mu values of 40 or better – otherwise **(THN)** is treated as greater than 1/8 inch.
3. THIN Ice **(THN-IR)** at -3°C or below if accompanied by Mu values of 40 or better, is considered **MEDIUM** Braking Action (Code 3).

Downgrade Assessment Criteria (Mu), Pilot Braking Action Descriptors and Landing Crosswind Component Limits

Code	6	5	4	3	2	1	0
Mu		40µ or higher	39-36µ	35-30µ	29-26µ	25-21µ	20µ or lower
Deceleration & Directional Control Observation		Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	Brake deceleration and controllability is between Good and Medium.	Braking deceleration is noticeably reduced for the wheel braking effort applied. Directional control may be slightly reduced.	Brake deceleration is between Medium and Poor. Potential for hydroplaning exists.	Braking deceleration is significantly reduced for the wheel braking effort applied. Directional control may be significantly reduced.	Braking deceleration is minimal to non-existent for the wheel braking effort applied. Directional control may be uncertain.
PIREP	Dry	Good	Good to Medium	Medium	Medium to Poor	Poor	Nil
Max Allowable Crosswind Component	40 kts	40 kts	30 kts	20 kts	17 kts	15 kts	N/A

Reduce guidelines by 5 kts on wet or contaminated runways whenever asymmetric reverse thrust is used. Crosswinds may be further restricted by emergency or abnormal procedures.

Sample Problem CDV

- Airport CDV Runway 27:
- The runway has been groomed 60 feet wide. Inside the groomed area the runway has 75% coverage of 1/4 inch slush. Outside the groomed area: compacted snow.
- Average surface temperature by runway thirds 0°C, -2°C, -1°C
- The operations vehicle experienced significantly reduced braking action and directional control on the first third of the runway.

RUNWAY CONDITION REPORT – DATA COLLECTION SHEET

Airport: CDV

Runway: 27 (Direction of Landing/Takeoff)

Alaska Flight # (That you prepared the runway for (if known)): 66

Local Time: 1635

Date: 12/12/09

Rwy % Coverage

	1/3	2/3	3/3
10%	☐	☐	☐
25%	☐	☐	☐
50%	☐	☐	☐
75%	X	X	X
100 %	☐	☐	☐

Total Rwy % Reported: 75

Rwy Contaminant Depth (inches)

	1/3	2/3	3/3
1/8"	☐	☐	☐
1/4"	X	X	X
1/2"	☐	☐	☐
3/4"	☐	☐	☐
1"	☐	☐	☐
2"	☐	☐	☐
3"	☐	☐	☐
4" or more	☐	☐	☐

Rwy Highest Depth Measured: 1/4

Rwy Contaminant Type

	1/3	2/3	3/3
Dry	☐	☐	☐
Wet	☐	☐	☐
Wet (slippery when wet)	☐	☐	☐
Water	☐	☐	☐
Slush	X	X	X
Dry Snow	☐	☐	☐
Wet Snow	☐	☐	☐
Compacted Snow (May include Imbedded Ice)	☐	☐	☐
Frost	☐	☐	☐
Ice	☐	☐	☐
Wet Ice, Water over Frozen Contaminant, Snow over Ice	☐	☐	☐

Report Contaminant with LOWER Condition Code: Slush

Temp °C

X Surface

☐ OAT

1/3	2/3	3/3
0	-2	-1

Please include other important Rwy information in the Remarks Section that will be reported to the Flight Crew.

*Remarks Section

Groomed 60 feet wide , remaining edges compacted snow.

RUNWAY CONDITION CODE

1/3	2/3	3/3
2	2	2

Note: Runway Condition Code is determined using the unshaded portion of the Matrix provided on the back. Runway Code 6/6/6 is not to be used in the Condition Report.

DOWNGRADED RUNWAY CODE

1/3	2/3	3/3
1	2	2

Note: The Runway Condition Code may be downgraded using the Downgrade Assessment Criteria shaded portion of the Matrix provided on the back. REPORT THIS CODE in your CONDITION REPORT.

Explain Why in Comments

Mu µ (1-100)

1/3	2/3	3/3

☐ CFME

☐ Decel

Remarks for other important Rwy conditions would be added here to the Condition Report.

"Matrix Report . . .

C D V	RWY 2 7	1 / 2 / 2	75 %	1/4 (INCH)	Slush	(*)	1635	12/12/09"
(Airport)	(Rwy#)	(Runway Codes)	(Total %)	(Highest Depth)	(Contaminant Type)	(Remarks)	(Time)	(Date)

Return this form to the Alaska Airlines Station Personnel

☐ Information entered into FAA Website Database

☐ COMAIL Completed Form (after data entry) to SEAOT – Chet Collett

Additional Comments Regarding Matrix Validation: Down graded because of significantly reduced Braking Action and Directional Control

Pilot Braking Action Survey Form

Landing Airport: _____ Landing Runway: _____

Flight Number__________ **Local Date:** ________ **Local Time:** _____ (24h)

Aircraft Type (Circle one): 737-400, 737-700, 737-800, 737-900

Approximate Landing Weight: _ _ _ . _ (in 1000 lbs.)

Based on the runway conditions reported (NOTAM or Verbal), the Braking Action was:
- ☐ Better than expected
- ☐ As Expected
- ☐ Worse than expected

If the runway is DRY, then no other Estimated Braking Action needs to be marked. We ask that you do your best to report your estimate of the wheel braking action as per the following terms and add comments below if necessary:

Deceleration And Directional Control Observation	PIREP	Estimated Braking Action
-	Dry	☐
Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	Good	☐
Brake deceleration and controllability is between Good and Medium.	Good to Medium	☐
Braking deceleration is noticeably reduced for the wheel braking effort applied. Directional control may be slightly reduced.	Medium	☐
Brake deceleration and controllability is between Medium and Poor. Potential for hydroplaning exists.	Medium to Poor	☐
Braking deceleration is significantly reduced for the wheel braking effort applied. Directional control may be significantly reduced.	Poor	☐
Braking deceleration is minimal to non-existent for the wheel braking effort applied. Directional control may be uncertain.	Nil	☐

Data to FAA Technical Center

- Over 3000 data points that match up between Airport Runway Assessment Reports and Pilot Braking Action Reports.

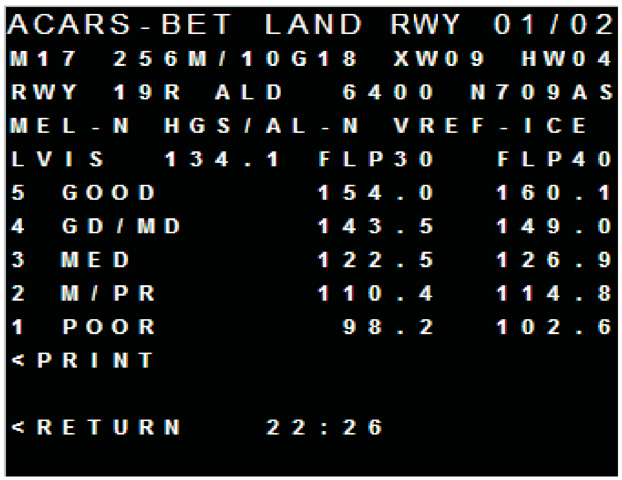
Observations / Initial Findings

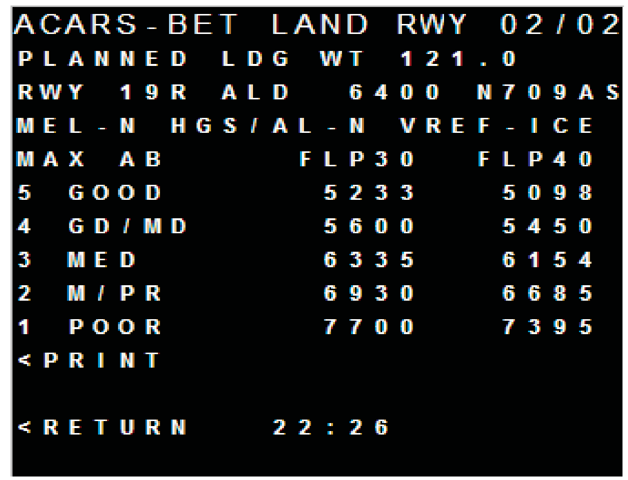
- **Overall the Matrix does a good job of predicting the slipperiness of the runway. In the absence of other information, conservatism is good.**
- **It is overly conservative in some areas**
  - Cold or Sanded Ice can be much better than a 1 or 0
  - Thin Ice can also be much better then a 1 or 0
  - Compacted Snow at warmer temperatures can be better than a 2

Compacted Snow (SIR-PSR)			Ice (IR)	
Any	Any	Any	Any[3]	Any
-13°C or Below	Above -13°C at or Below -3°C	Above -3°C	-3°C or Below	Above -3°C
4	3	2	1	0

- **The struggle is – How do you validate this?**
  - Possibly allow Mu to be used by qualified Airport Personnel to validate that the Ice is really thin, or the sand had made it better?
  - There needs to be a way that the airport operator can use all available tools in their tool box to accurately describe the Runway Condition Code. We agree with not reporting Mu to the Pilot, but may be used along with the other tools

Aircraft Performance by the Numbers





Questions?

?

Alaska Airlines' Runway Surface Condition Report Assessment Table (RSCRAT)

RUNWAY SURFACE CONDITION REPORT ASSESSMENT TABLE (RSCRAT)

	Dry	Wet[1] (Includes water 1/8" or less and Damp)		Contaminant									
Type	N/A	Any	Slippery When Wet	Frost	Standing Water or Slush (WTR-SLR)		Wet Snow or Dry Snow (WSR-LSR)		Compacted Snow (May include Imbedded Ice) (SIR-PSR)		Dry or Wet Snow Over Compacted Snow (WSR OVR SIR)	Ice[2] (IR)	Wet Ice[2] Water Over Compacted Snow[2] Dry or Wet Snow Over Ice[2]
Depth[3]	N/A	1/8" or less		N/A	1/8" or less	Greater than 1/8"	1/8" or less	Greater than 1/8"	Any	Any	Any	Any	Any
Notes			Slippery When Wet used to indicate excess rubber deposits in touchdown zones.		For Standing Water 1/8" or less report as WET				OAT -15°C or Colder	OAT Warmer than -15°C			Taxi, takeoff, and landing operations in NIL conditions are prohibited.
Rwy Code	**6**	**5 (GOOD)**	**3 (MEDIUM)**	**5 (GOOD)**	**5 (GOOD)**	**2 (MED to POOR)**	**5 (GOOD)**	**3 (MEDIUM)**	**4 (GOOD to MED)**	**3 (MEDIUM)**	**3 (MEDIUM)**	**1 (POOR)**	**0 (NIL)**

1 For Takeoff – use WET data for any loose contaminant 1/8 inch or less. For Landing – Dispatch Planning, use Wet Landing Field Length Limit Weight if runway is WET.
2 The Runway Codes of 1 or 0 may be upgraded to Code 3 if accompanied by current Mu values 40 or better.
3 THIN (THN) may be treated as 1/8 inch or less depth if accompanied by Mu values 40 or better – otherwise THIN (THN) is treated as 1/4 inch.

CAUTION

Temperatures near and above freezing (e.g., at -3°C and warmer) may cause contaminants to behave more slippery than indicated by the runway condition code given in the Runway Surface Condition Report Assessment Table. At these temperatures, airport operators should exercise a heightened level of runway assessment, and should downgrade the runway condition code if appropriate.

Downgrade Assessment Criteria (Mu), Pilot Braking Action Descriptors and Crosswind Component Limits							
Code	6	5	4	3	2	1	0
Mu (μ)[4]		40μ or higher	39-36μ	35-30μ	29-26μ	25-21μ	20μ or lower
Deceleration & Directional Control Observation		Braking deceleration is normal for the wheel braking effort applied. Directional control is normal.	Brake deceleration and controllability is between GOOD and MEDIUM.	Braking deceleration is noticeably reduced for the wheel braking effort applied, or directional control is slightly reduced.	Brake deceleration is between MEDIUM and POOR. Potential for hydroplaning exists.	Braking deceleration is significantly reduced for the wheel braking effort applied, or directional control is significantly reduced.	Braking deceleration is minimal to non-existent for the wheel braking effort applied, or directional control is minimal to non-existent.
PIREP	Dry	GOOD	GOOD to MEDIUM	MEDIUM	MEDIUM to POOR	POOR	NIL
Takeoff Max Allowable Crosswind Component	40 kts (400) 36/34 kts (NG) without/with winglets	25 kts	20 kts	16 kts (400) 15 kts (NG)	13 kts (400) 12 kts (NG)	10 kts	N/A
Landing Max Allowable Crosswind Component	40 kts	40 kts	30 kts	20 kts	17 kts	15 kts	N/A

4 The correlation of the Mu (μ) values with runway conditions and condition codes in the Runway Surface Condition Report Assessment Table are only approximate ranges for a generic friction measuring device **and are intended to be used only to downgrade a runway condition code**.

TAKEOFF AND LANDING GUIDELINES

TAKEOFF

Data Selection

Takeoff by reference to:

- TPR
- ACARS TO Manual Request
- Performance Handbook

If final weight is more than 3000 lbs below the PTOW, a manual request is recommended, time and workload permitting.

Takeoff on WET or Contaminated Runways

First determine type of performance problem by runway description:

- WET
- Slippery – Hard-Packed Contaminant
- Loose Contaminant

Wet – Visible dampness or loose contaminant (slush, snow, standing water) up to 1/8-inch (3 mm) deep

- Enter ACARS with WET

Slippery (IR, SIR, PSR):

- Braking Action Report available: enter BA into ACARS.
- Braking Action Report not available: Use RSCRAT to determine BA, enter value into ACARS.

Loose Contaminant (WTR, SLR, WSR, >1/8" LSR)

- Enter contaminant type and depth into ACARS. Do Not use RSCRAT.

CONTAMINATED RUNWAY TAKEOFF RESTRICTIONS

Takeoffs are prohibited when:

- Braking action NIL or Mu value 20 or below
- Crosswinds exceed published Limits
- Operations with a steady-state tailwind component in excess of 10 kts on any runway which has ice, slush, snow, or standing water on the usable surface

See Section 5.300, Takeoff Prohibited, for full list of takeoff prohibitions.

GENERAL NOTES

Priority of Surface Condition Reports

Most current of the following:

- Braking Action Report from a similar aircraft
- Runway condition code based on RSCRAT for reported contaminant type and depth

A runway is considered WET when:

- Visible dampness or loose contaminant (slush, snow, standing water) up to 1/8-inch (3 mm) deep
- Experiencing active precipitation

Friction Report Rules

Do Not base landing decision upon Mu alone – must be accompanied by Pilot Braking Action or Runway Description.

Downgrade if more current Mu readings are worse than the condition might indicate from the RSCRAT.

Baking Action Reporting

Ensure **ACARS FLT SUMMARY** reflects accurate assessment of braking action.

LANDING

Latest Touchdown Point (LTP)

This value can be determined by subtracting the calculated landing distance from the LDA and adding 1000 ft for the already included air run.

LTP must be based on MAX autobrake data when the runway is less than 7000 ft **and** less than GOOD.

Max Effort Stop – When braking action is anticipated to be less than GOOD and the Landing Distance Available (LDA) is less than 7000 ft, an autobrake setting of MAX must be used, if available. MAX autobrake in combination with max manual braking must be utilized until stopping is ensured.

Quick Reference Landing Analysis Wet/Dry Runway

All Fleets can attain Max Structural Landing Weight with braking action GOOD or better and:

RWY $\geq$ 7000 ft Available	**OR**	RWY $\geq$ 8000 ft Available
Temp $\leq$ 35°C		Temp $\leq$ 35°C
Alt $\leq$ 4000 ft		Alt $\leq$ 4000 ft
Headwind $\geq$ 0		Tailwind up to 15 kts

LANDING

Pre-Flight Analysis

For Contaminated Runways:

- Pilot and Dispatch briefing required.
- Pilot should analyze potential landing conditions using the ACARS Landing Data or Operational Landing Data Tool to determine the worst braking action acceptable for the planned landing weight.

Near Time of Landing Analysis

For any runway:

- Pilots shall land within Performance Data Criteria for the data used.
- If MAX autobrake data does not support landing indicated by NA or "*", do not attempt landing under those conditions.
- Rejected Landing should be executed anytime touchdown past the LTP is anticipated. The PNF shall monitor and call for a rejected landing if necessary.

For contaminated runway:

- Approach Briefing will include anticipated braking action, LTP, and worst acceptable braking action.

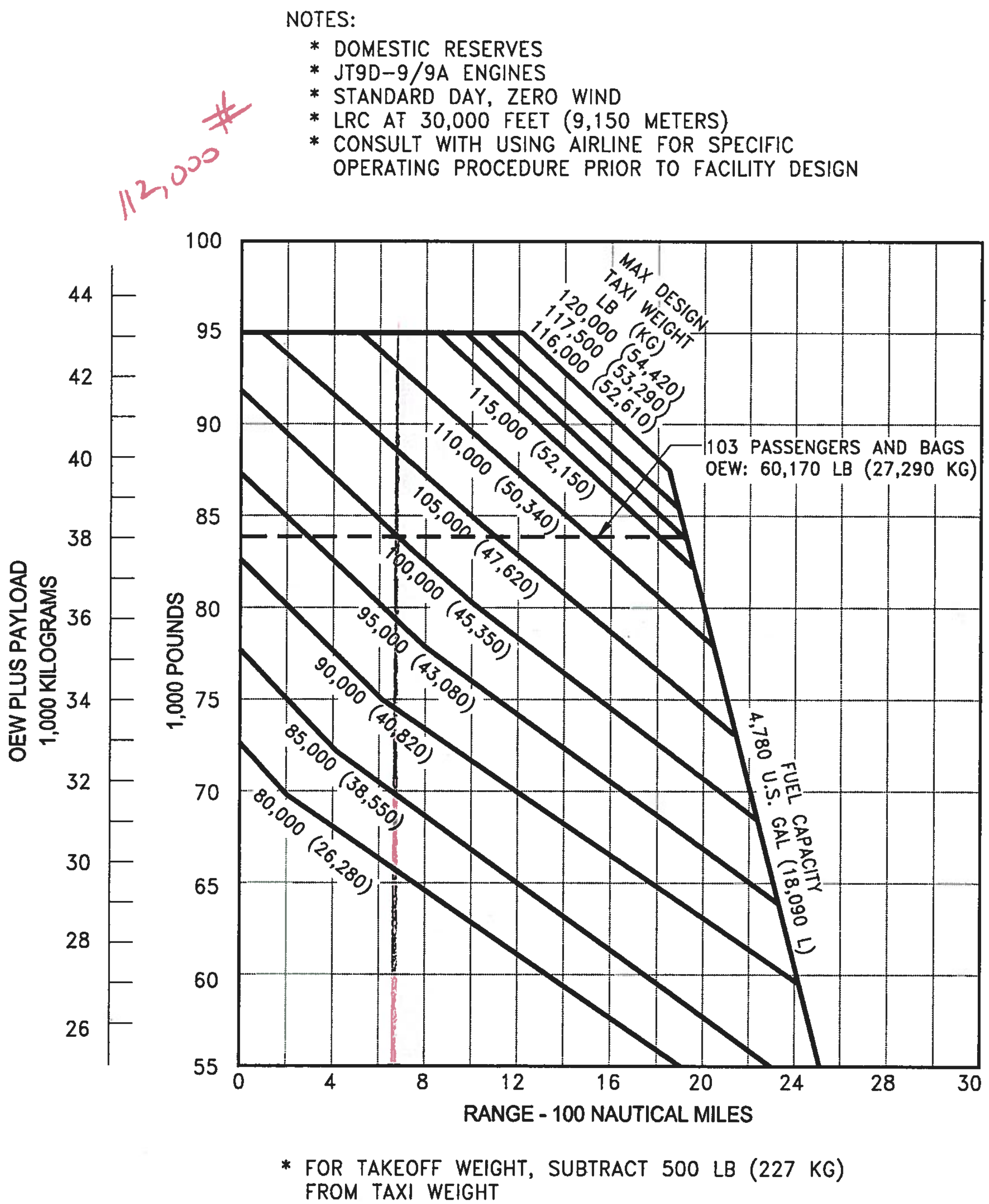
CONTAMINATED RUNWAY LANDING RESTRICTIONS

Landing is prohibited when any of the following conditions exist:

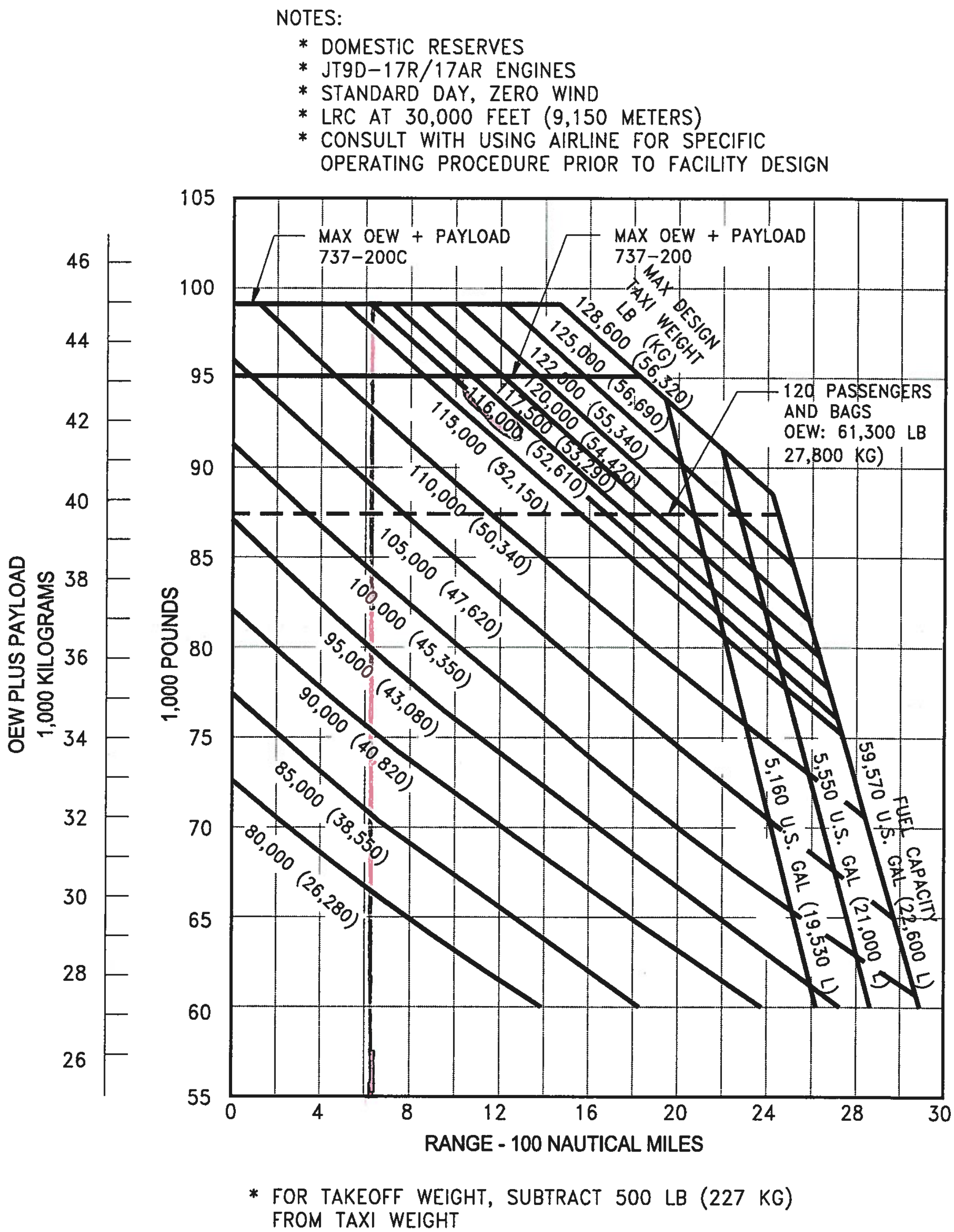
- Crosswinds exceed published limits.
- Contaminated Runway without a Pilot Braking Action Report or Runway Surface Condition Report.
- Braking action NIL or Mu 20 or below.
- When the minimum prepared runway surface width for operation is less than 60 ft to include provisions for clearing or turning around as required.
- When the Captain's in-flight analysis shows there is not adequate landing distance available or landing weight is above limits for conditions.
- Runway surface less than 7000 ft and braking action less than GOOD if:
  - Tailwind greater than 5 kts, or
  - Any inoperative thrust reverser, or
  - Antiskid system inoperative, or
  - Snow/Ice contamination is present in combination with drizzle or rain of any intensity.

See Section 5.500, Landing – Prohibitions, for full list of landing prohibitions.

Boeing Performance Charts



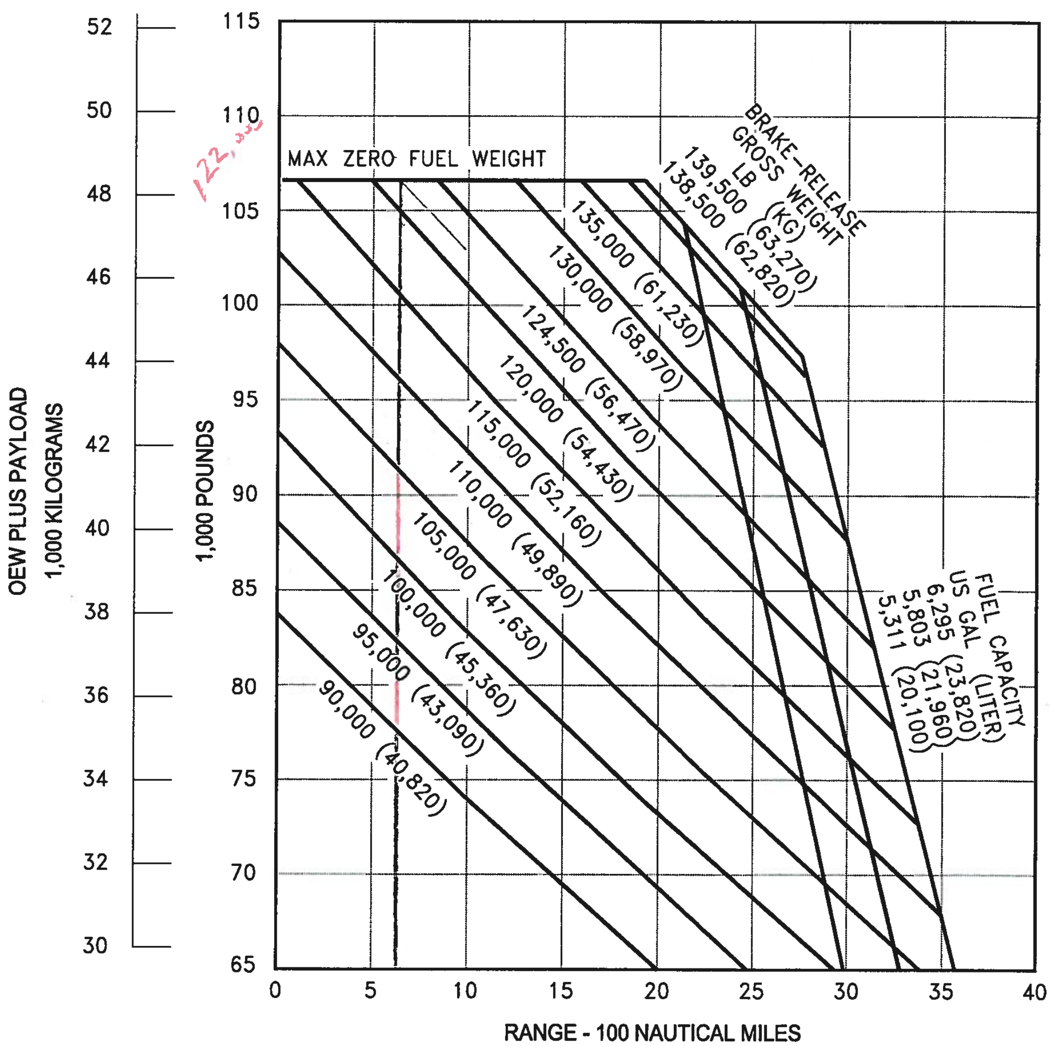
3.2.2 PAYLOAD/RANGE FOR LONG-RANGE CRUISE
MODEL 737-200 (JT8D-9/9A ENGINES)



3.2.5 PAYLOAD/RANGE FOR LONG-RANGE CRUISE

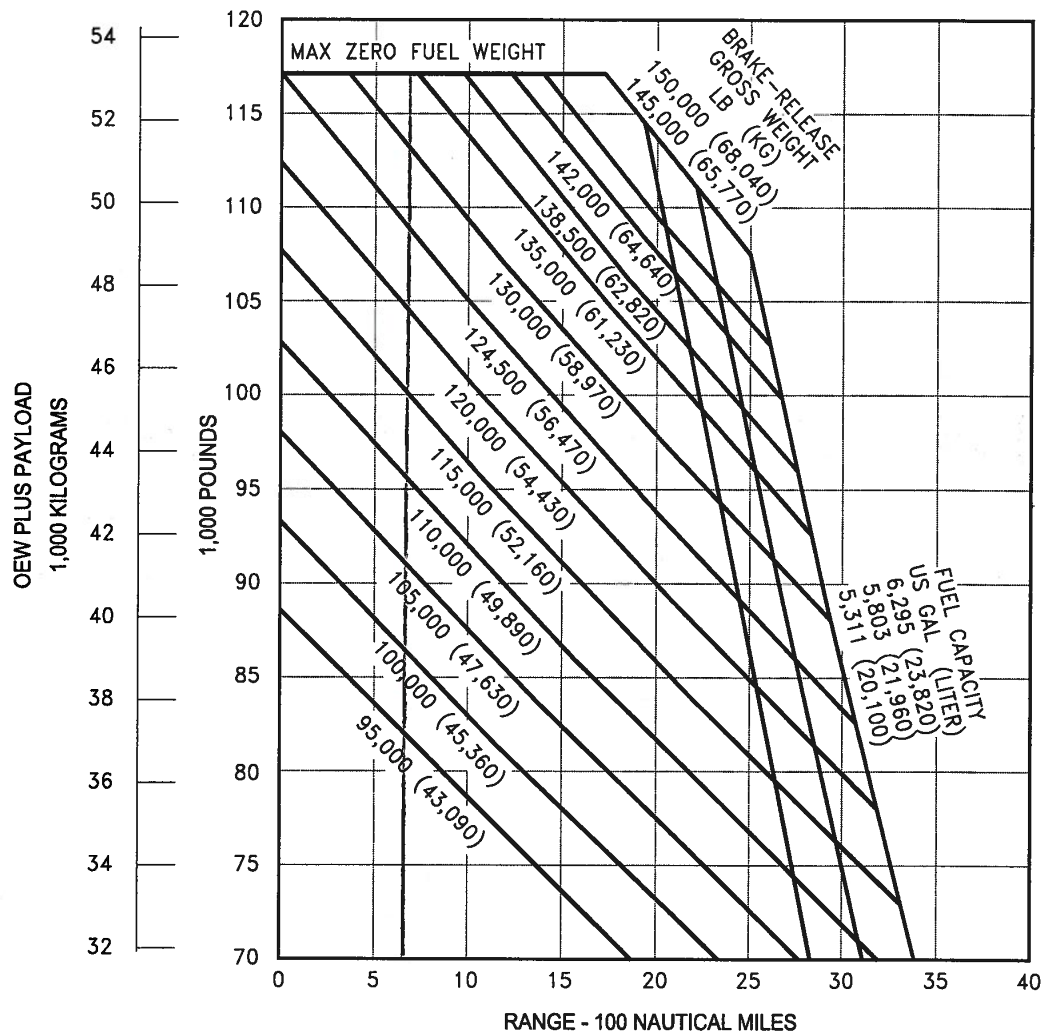
MODEL ADVANCED 737-200 (JT8D-17R/17AR ENGINES)

NOTES:
* DOMESTIC RESERVES
* CFM56-3B-1 OR CFM56-3B-2 ENGINES
* STANDARD DAY, ZERO WIND
* LRC AT 31,000/35,000 FEET
* CONSULT USING AIRLINE FOR SPECIFIC
OPERATING PROCEDURE PRIOR TO FACILITY DESIGN



3.2.6 PAYLOAD/RANGE FOR LONG-RANGE CRUISE
MODEL 737-300

NOTES:
* DOMESTIC RESERVES
* CFM56-3B-2 OR CFM56-3C-1 ENGINES
* STANDARD DAY, ZERO WIND
* LRC AT 31,000/35,000 FEET
* CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN

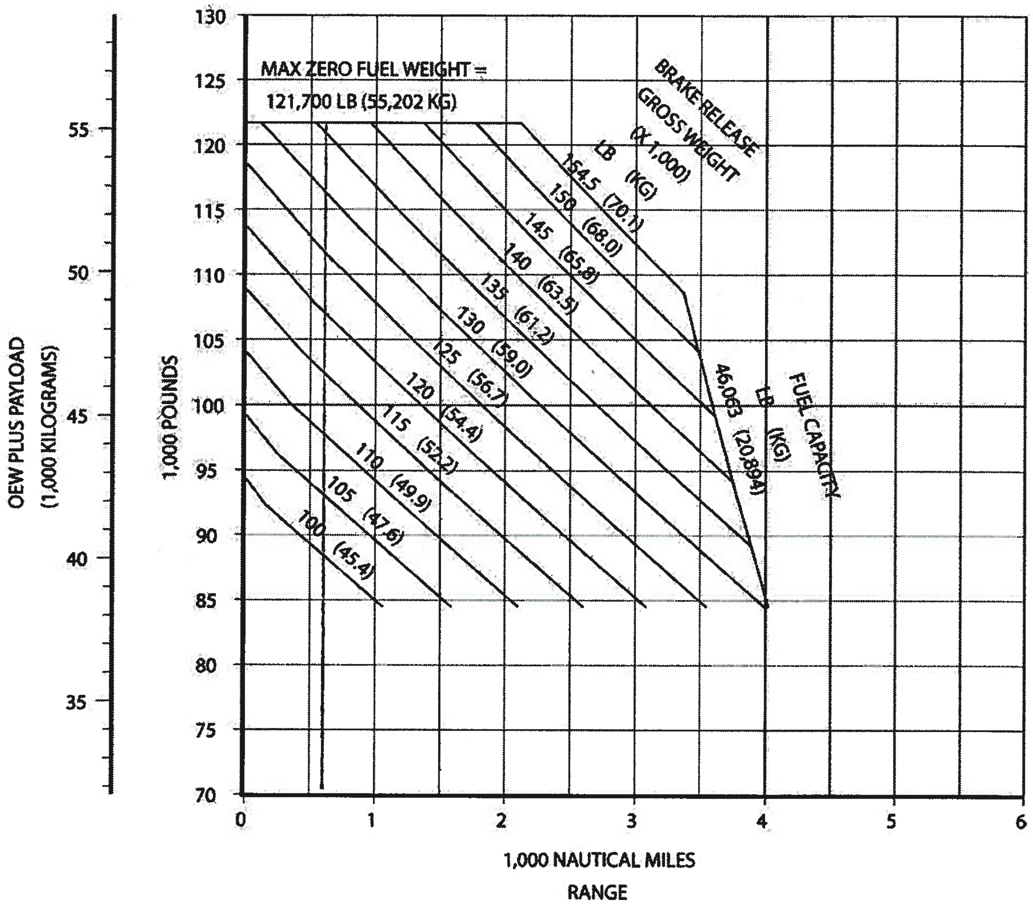


3.2.7 PAYLOAD/RANGE FOR LONG-RANGE CRUISE
MODEL 737-400

DO NOT USE FOR DISPATCH

Payload/Range
737-700/-700W (CFM56-7B Series)

- STANDARD DAY, ZERO WIND
- CRUISE MACH = LRC
- NORMAL POWER EXTRACTION AND AIR CONDITIONING BLEEDS
- TYPICAL MISSION RULES
- NON-WINGLET PERFORMANCE SHOWN. WINGLET AIRCRAFT WILL HAVE SLIGHTLY GREATER RANGE.
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE AND OEW PRIOR TO FACILITY DESIGN.



3.2.10 PAYLOAD/RANGE FOR LONG-RANGE CRUISE

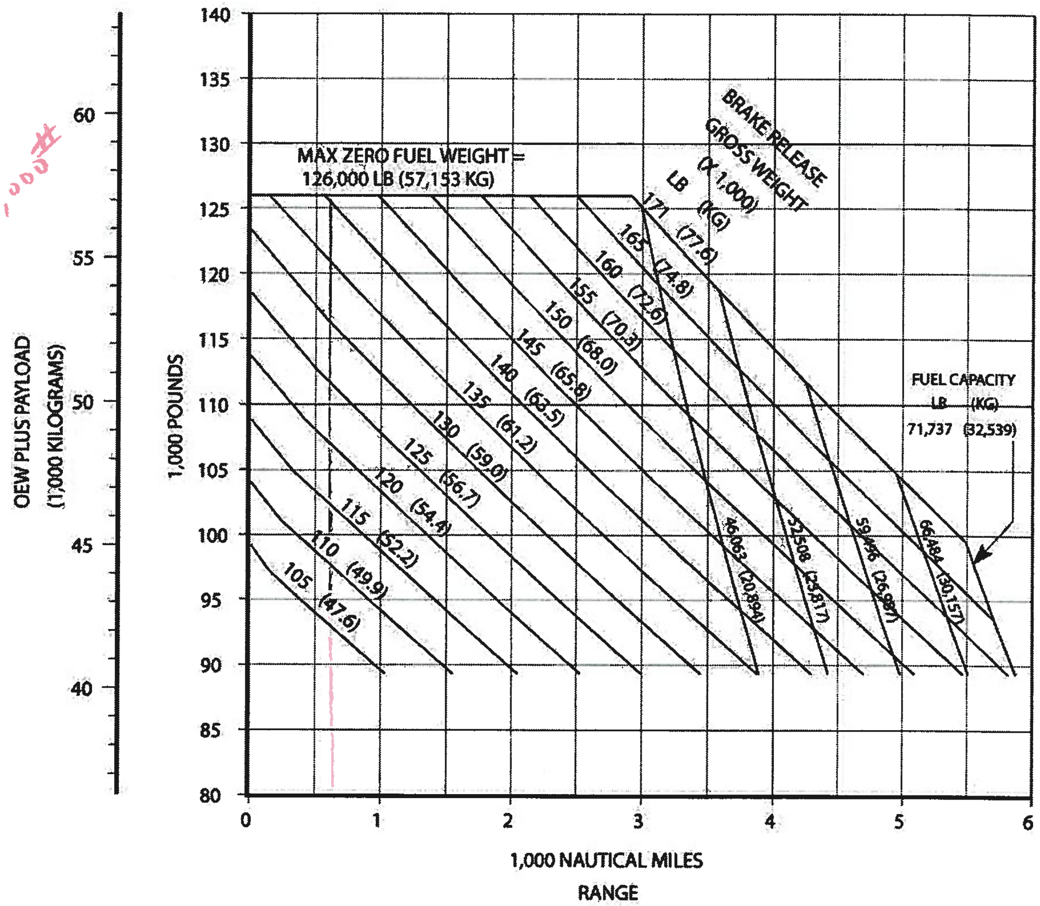
MODEL 737-700

DO NOT USE FOR DISPATCH

Payload/Range
737-700ER/-700ERW/-700C/-700CW/BBJ1 (CFM56-7B Series)

- STANDARD DAY, ZERO WIND
- CRUISE MACH = LRC
- NORMAL POWER EXTRACTION AND AIR CONDITIONING BLEEDS
- TYPICAL MISSION RULES
- NON-WINGLET PERFORMANCE SHOWN. WINGLET AIRCRAFT WILL HAVE SLIGHTLY GREATER RANGE.
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE AND OEW PRIOR TO FACILITY DESIGN.

140,000#



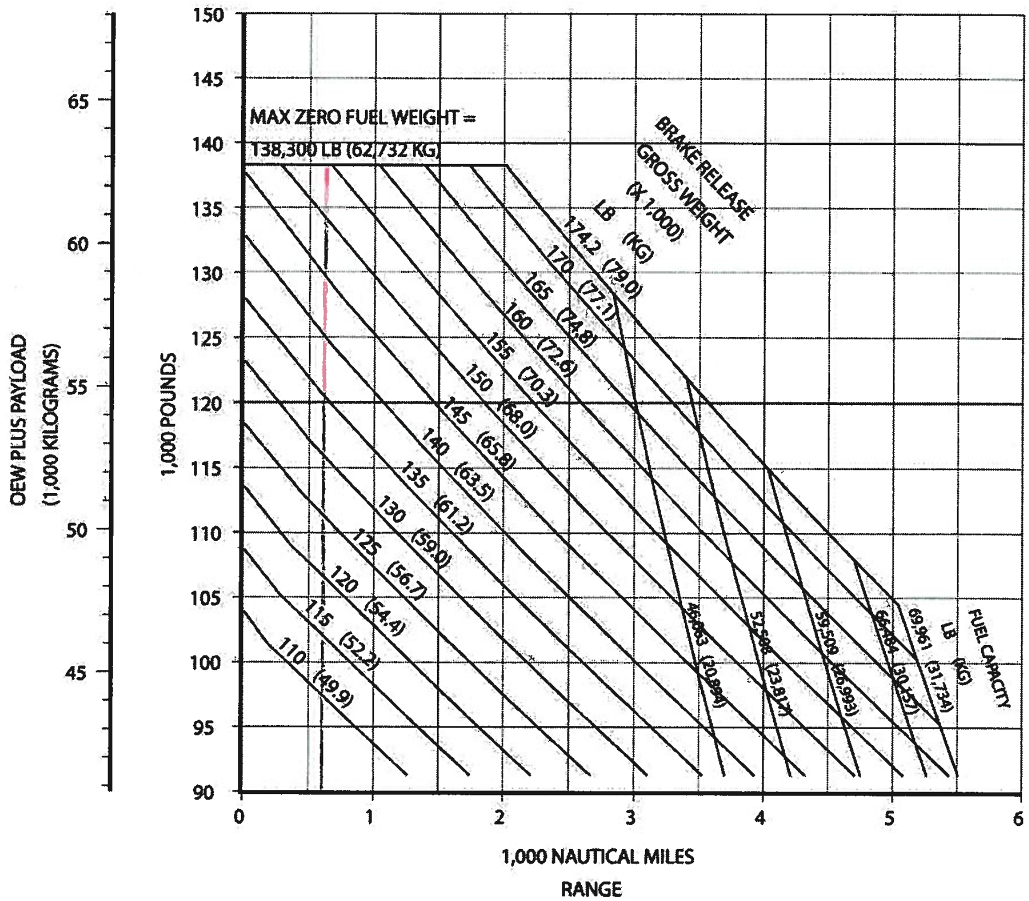
3.2.11 PAYLOAD/RANGE FOR LONG-RANGE CRUISE

MODEL 737-700ER

DO NOT USE FOR DISPATCH

Payload/Range
737-800/800W/BBJ2 (CFM56-7B Series)

- STANDARD DAY, ZERO WIND
- CRUISE MACH = LRC
- NORMAL POWER EXTRACTION AND AIR CONDITIONING BLEEDS
- TYPICAL MISSION RULES
- NON-WINGLET PERFORMANCE SHOWN. WINGLET AIRCRAFT WILL HAVE SLIGHTLY GREATER RANGE.
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE AND OEW PRIOR TO FACILITY DESIGN.



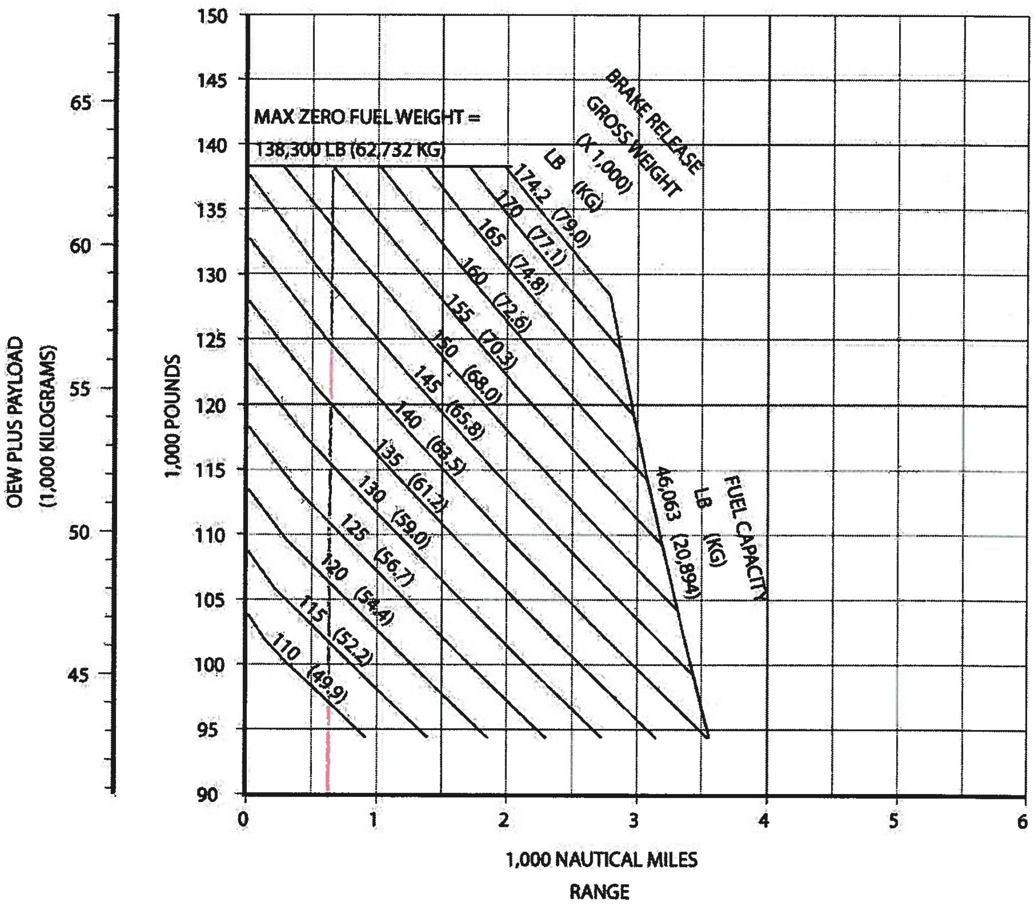
3.2.12 PAYLOAD/RANGE FOR LONG-RANGE CRUISE

MODEL 737-800

DO NOT USE FOR DISPATCH

Payload/Range
737-900/-900W (CFM56-7B Series)

- STANDARD DAY, ZERO WIND
- CRUISE MACH = LRC
- NORMAL POWER EXTRACTION AND AIR CONDITIONING BLEEDS
- TYPICAL MISSION RULES
- NON-WINGLET PERFORMANCE SHOWN. WINGLET AIRCRAFT WILL HAVE SLIGHTLY GREATER RANGE.
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE AND OEW PRIOR TO FACILITY DESIGN.



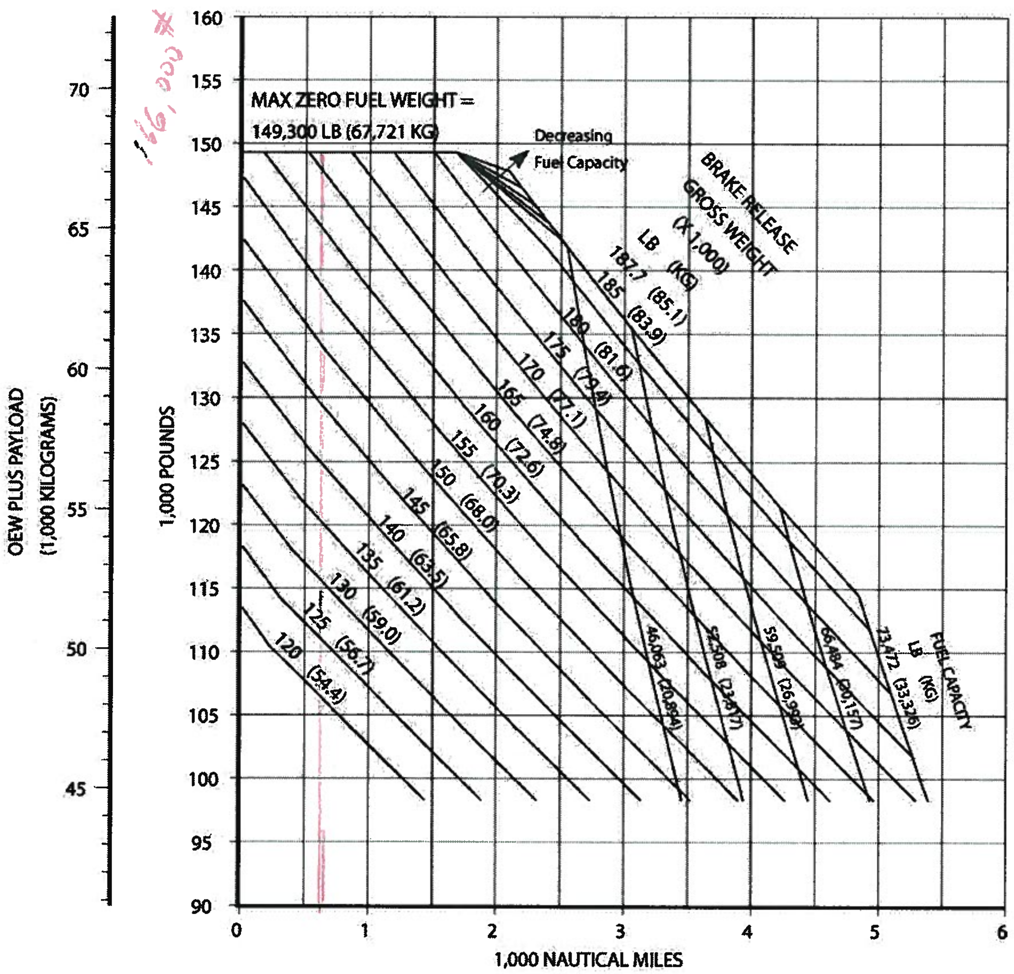
3.2.13 PAYLOAD/RANGE FOR LONG-RANGE CRUISE

MODEL 737-900

DO NOT USE FOR DISPATCH

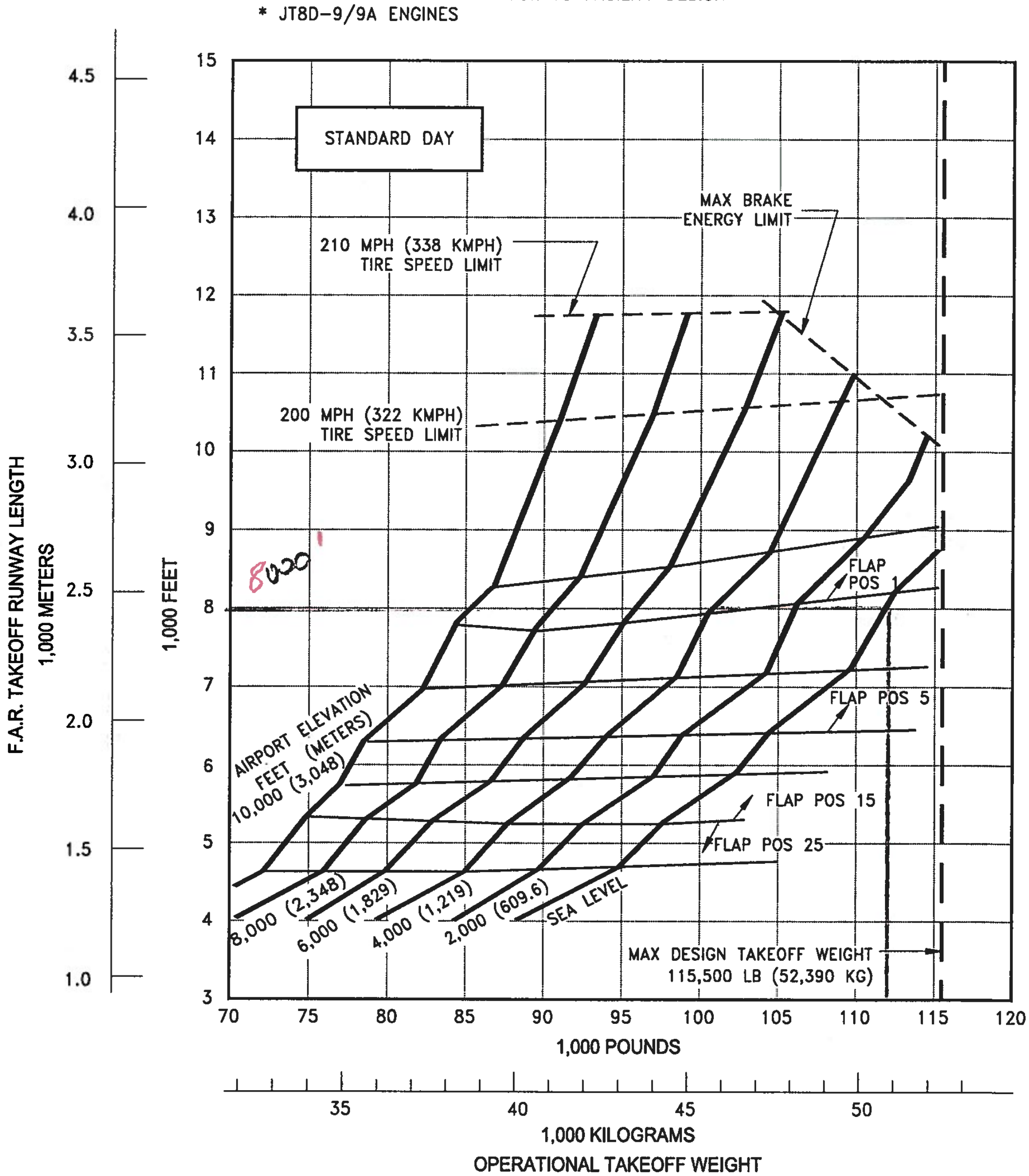
Payload/Range
737-900ER/900ERW/BBJ3 (CFM56-7B Series)

- STANDARD DAY, ZERO WIND
- CRUISE MACH = LRC
- NORMAL POWER EXTRACTION AND AIR CONDITIONING BLEEDS
- TYPICAL MISSION RULES
- NON-WINGLET PERFORMANCE SHOWN. WINGLET AIRCRAFT WILL HAVE SLIGHTLY GREATER RANGE.
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE AND OEW PRIOR TO FACILITY DESIGN.



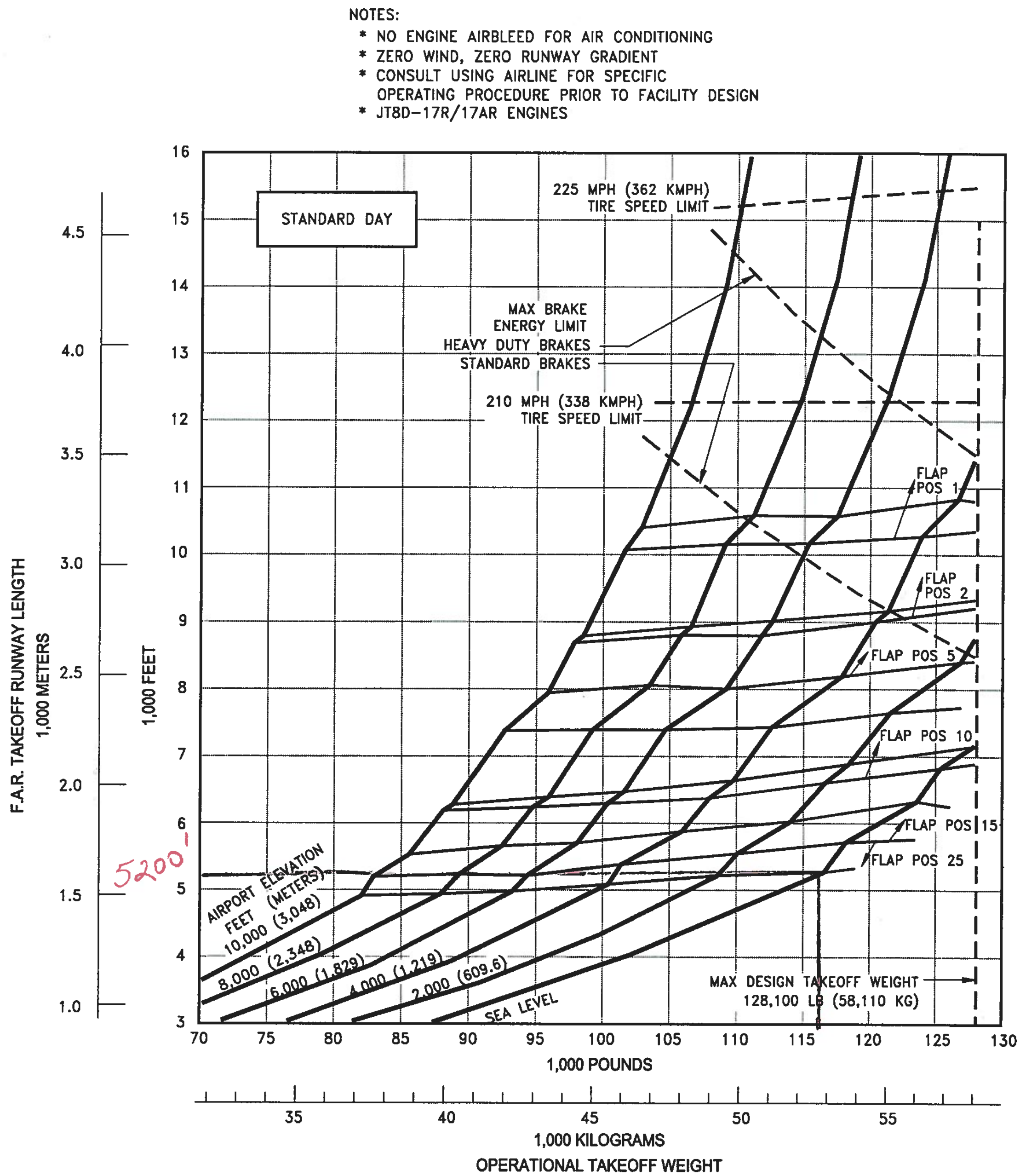
3.2.14 PAYLOAD/RANGE FOR LONG-RANGE CRUISE
MODEL 737-900ER

NOTES:
* NO ENGINE AIRBLEED FOR AIR CONDITIONING
* ZERO WIND, ZERO RUNWAY GRADIENT
* CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN
* JT8D-9/9A ENGINES

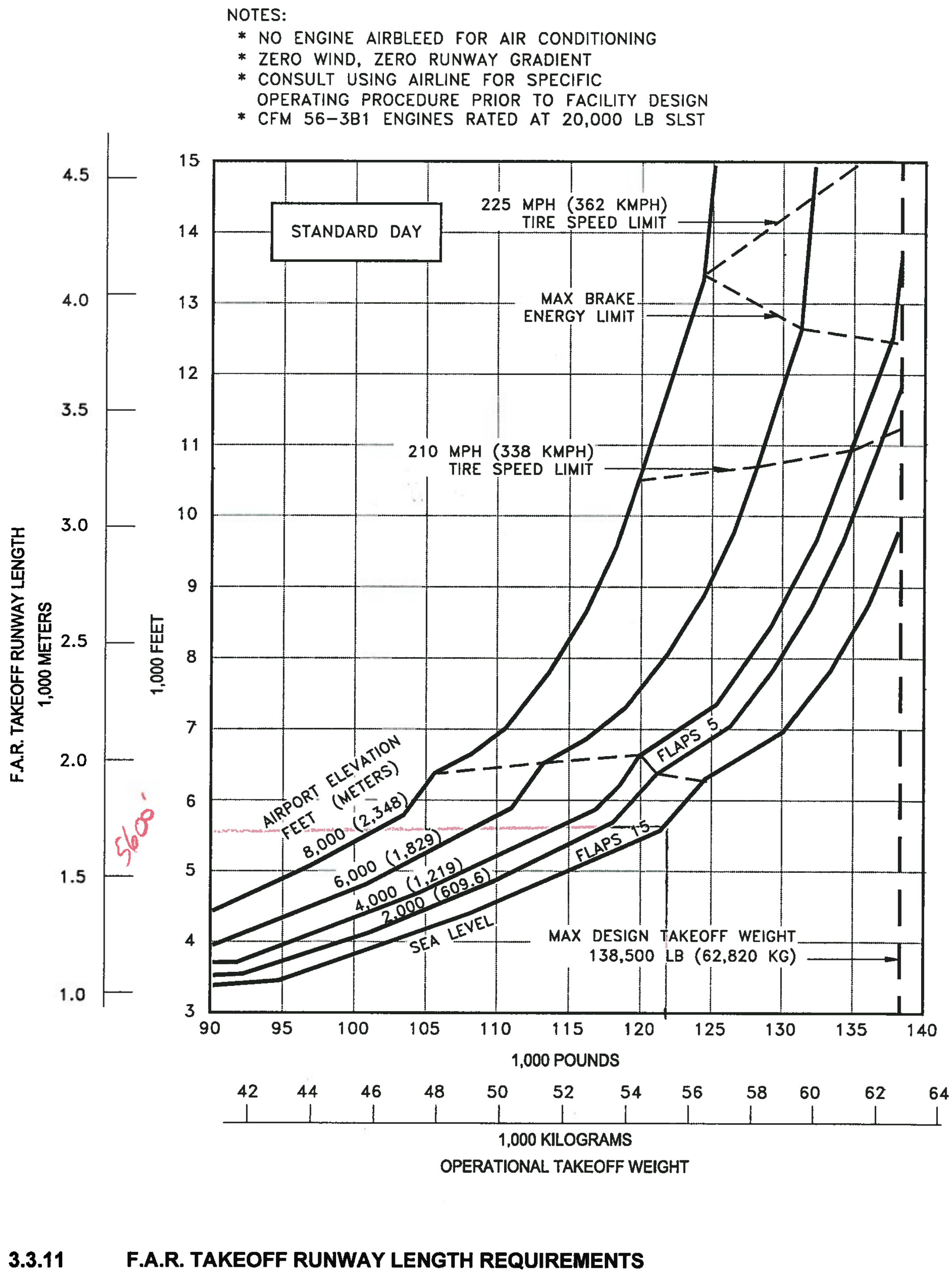


3.3.2 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS STANDARD DAY

MODEL 737-200 (JT8D-9/9A ENGINES)



3.3.9 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS
STANDARD DAY
MODEL ADVANCED 737-200 (JT8D-17R/17AR ENGINES)

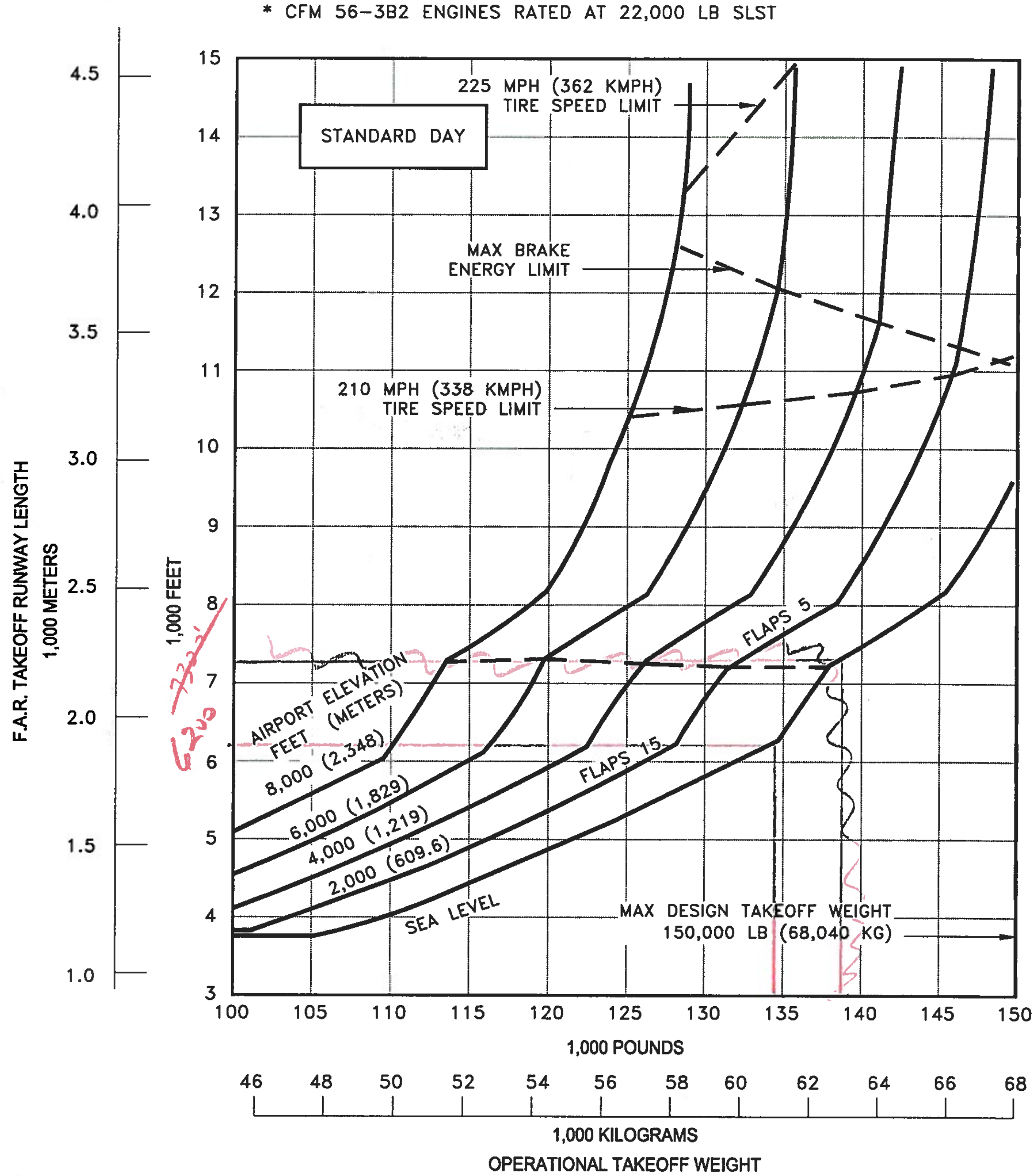


3.3.11 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS STANDARD DAY

MODEL 737-300 (CFM56-3B1 ENGINES AT20,000 LB SLST)

NOTES:

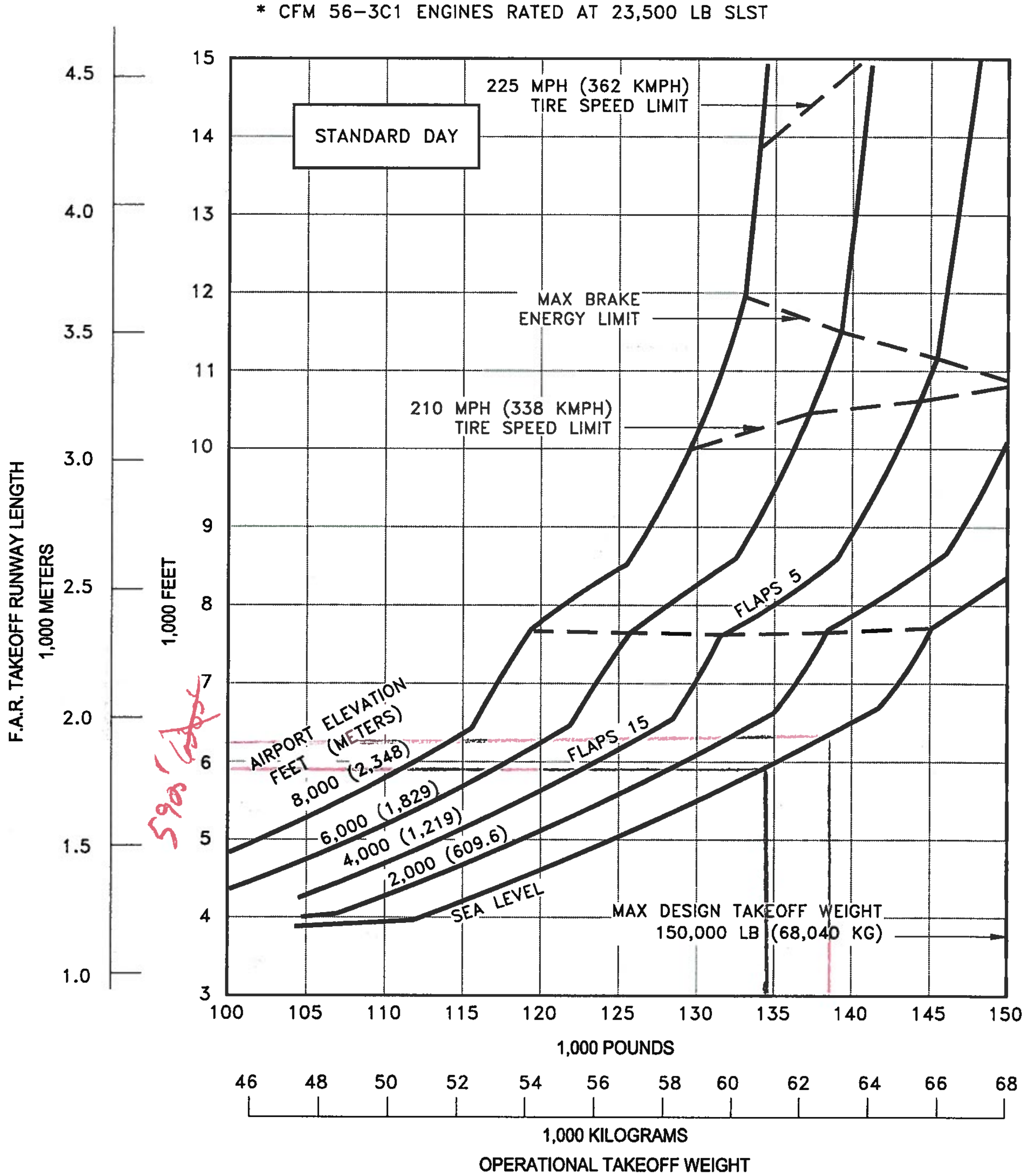
* NO ENGINE AIRBLEED FOR AIR CONDITIONING
* ZERO WIND, ZERO RUNWAY GRADIENT
* CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN
* CFM 56–3B2 ENGINES RATED AT 22,000 LB SLST



3.3.15 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS STANDARD DAY

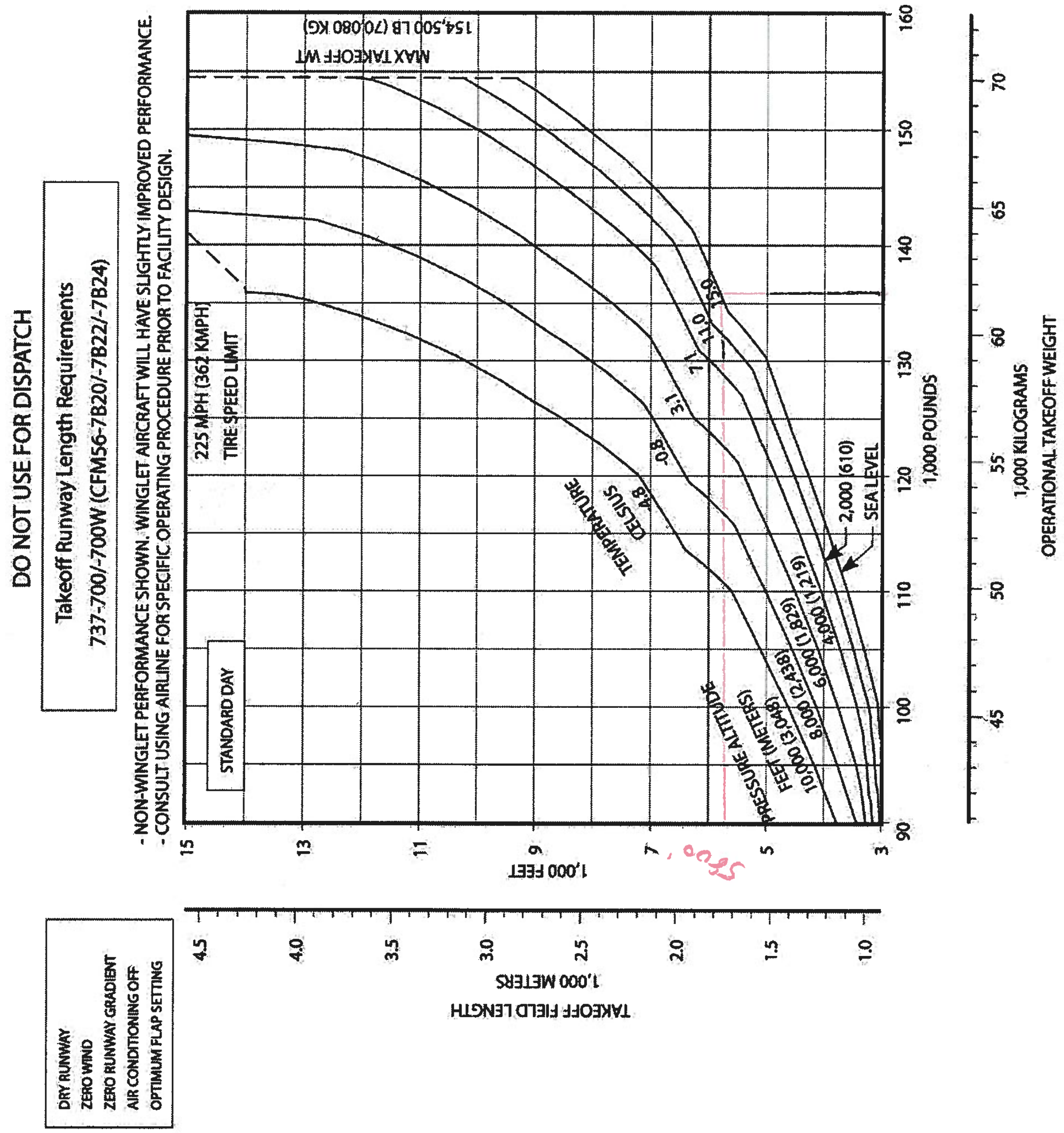
MODEL 737-400 (CFM56-3B-2 ENGINES AT 22,000 LB SLST)

NOTES:
* NO ENGINE AIRBLEED FOR AIR CONDITIONING
* ZERO WIND, ZERO RUNWAY GRADIENT
* CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN
* CFM 56-3C1 ENGINES RATED AT 23,500 LB SLST

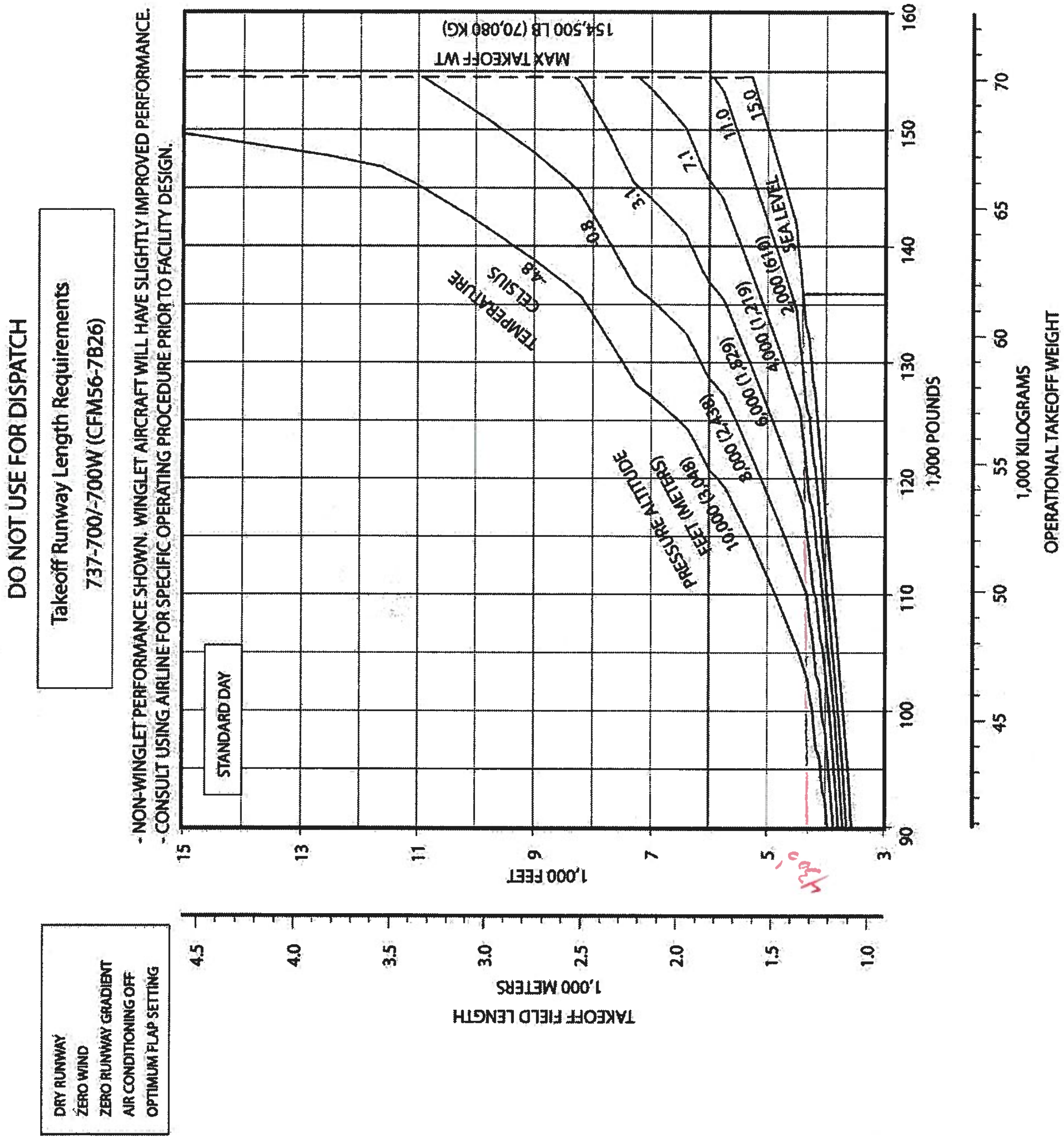


3.3.17 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS STANDARD DAY

MODEL 737-400 (CFM56-3C1 ENGINES AT 23,500 LB SLST)

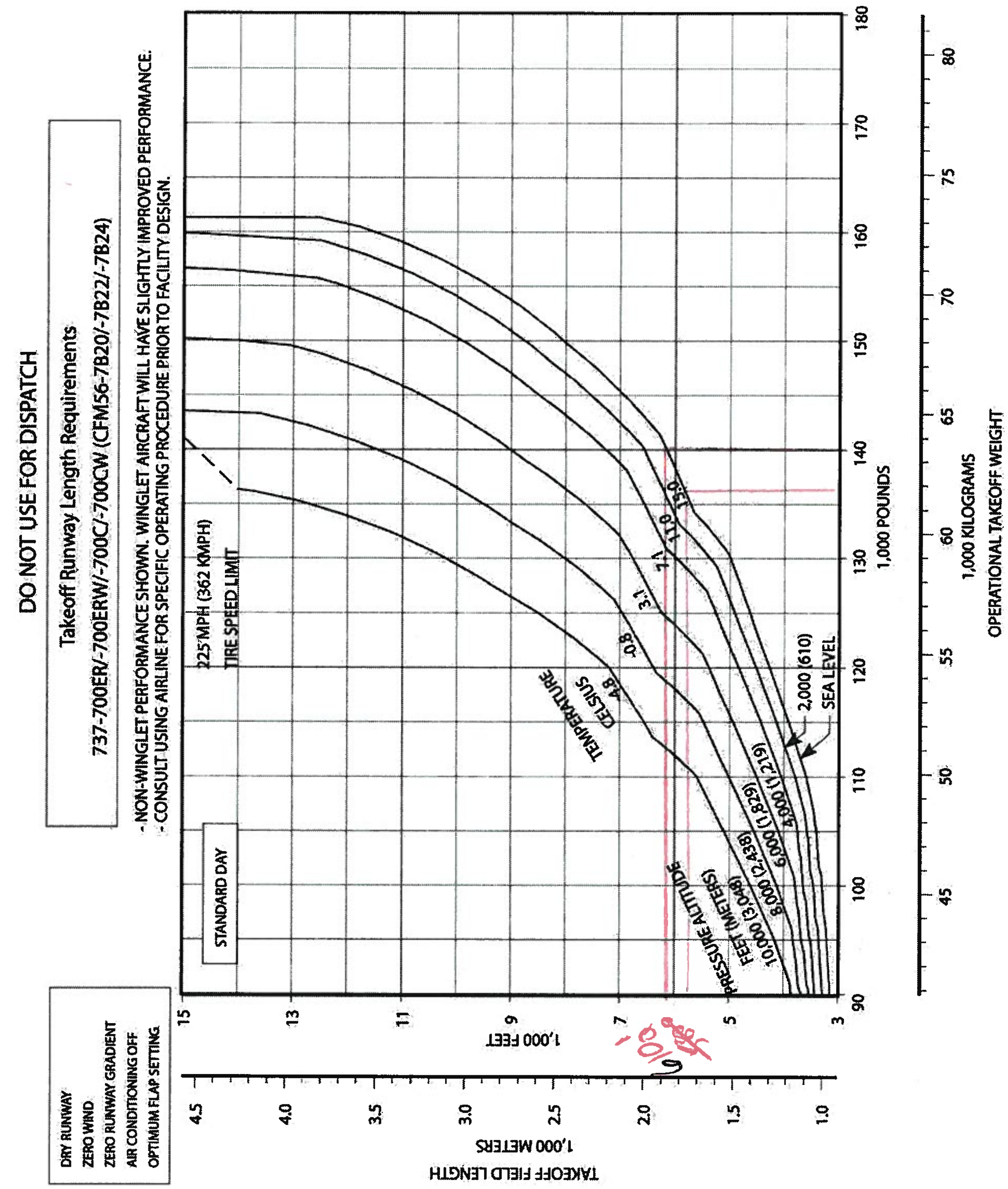


3.3.31 **F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS**
STANDARD DAY, DRY RUNWAY
MODEL 737-700 (CFM56-7B20/-7B22/-7B24 ENGINES AT 20,000 LB SLST)



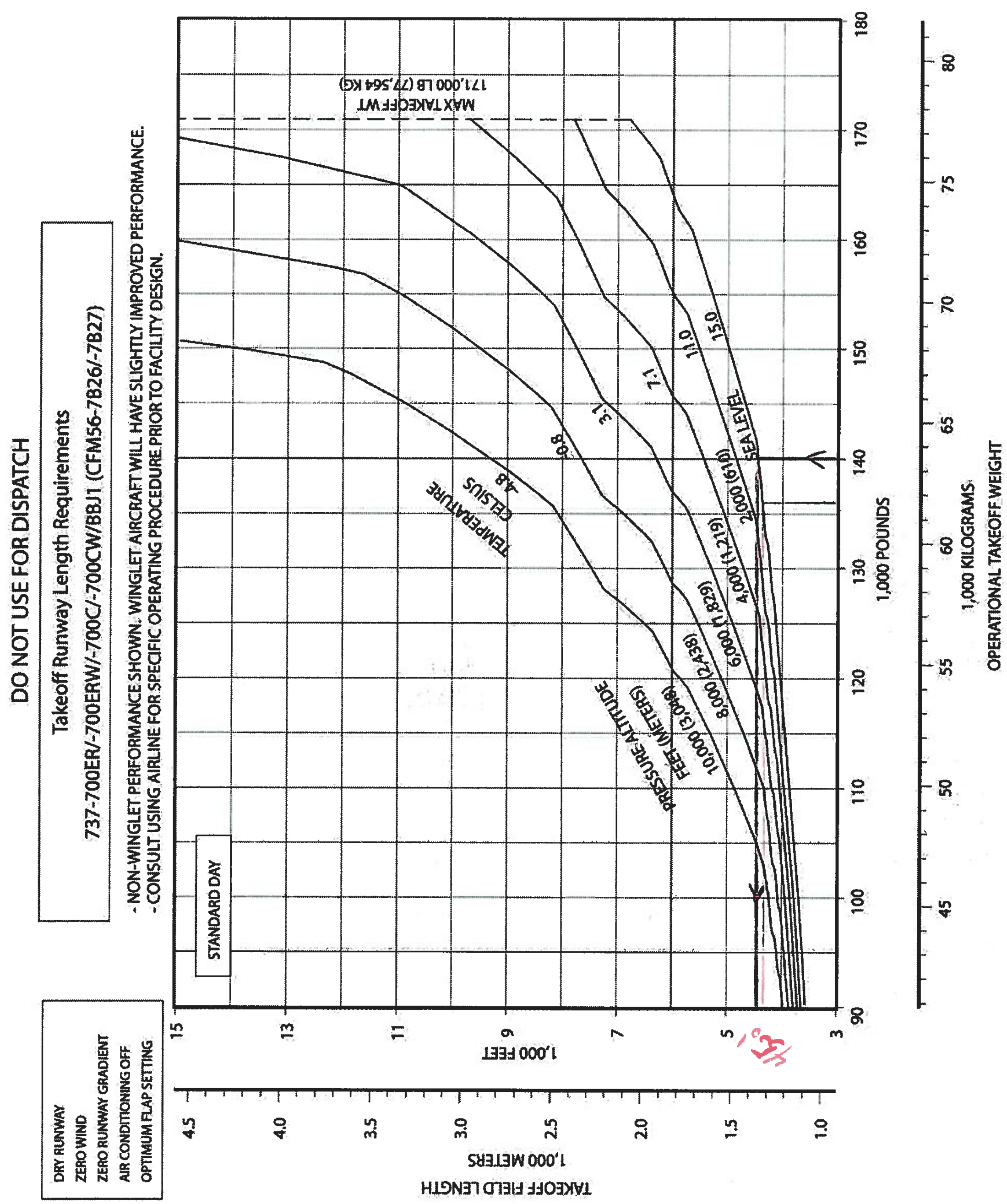
3.3.35 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS STANDARD DAY, DRY RUNWAY

MODEL 737-700/-700W (CFM56-7B26 ENGINES AT 26,000 LB SLST)

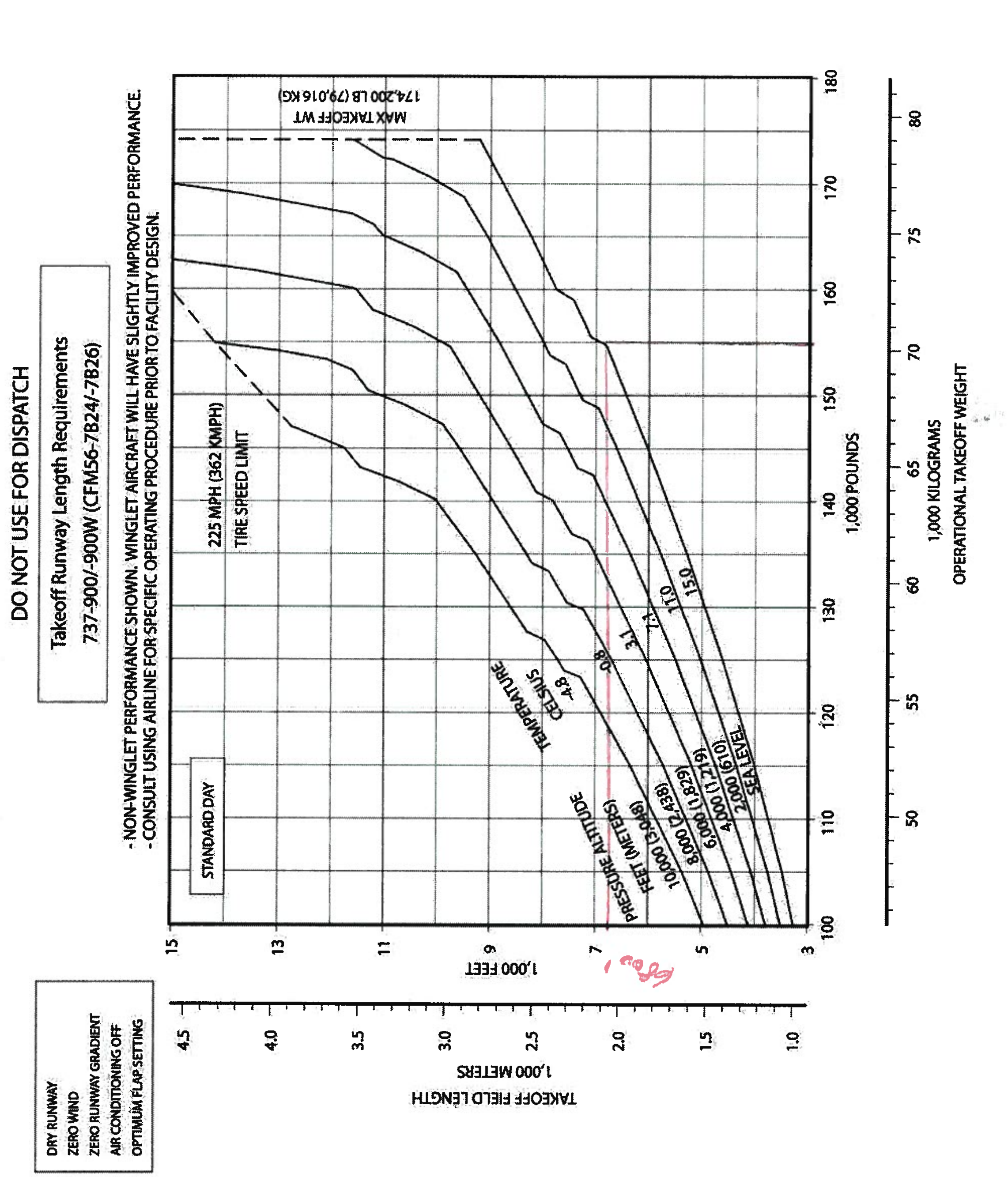


3.3.39 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS
STANDARD DAY, DRY RUNWAY

MODEL 737-700ER/-700ERW/-700C/-700CW (CFM56-7B20/-7B22/-7B24 ENGINES AT 20,000 LB SLST)

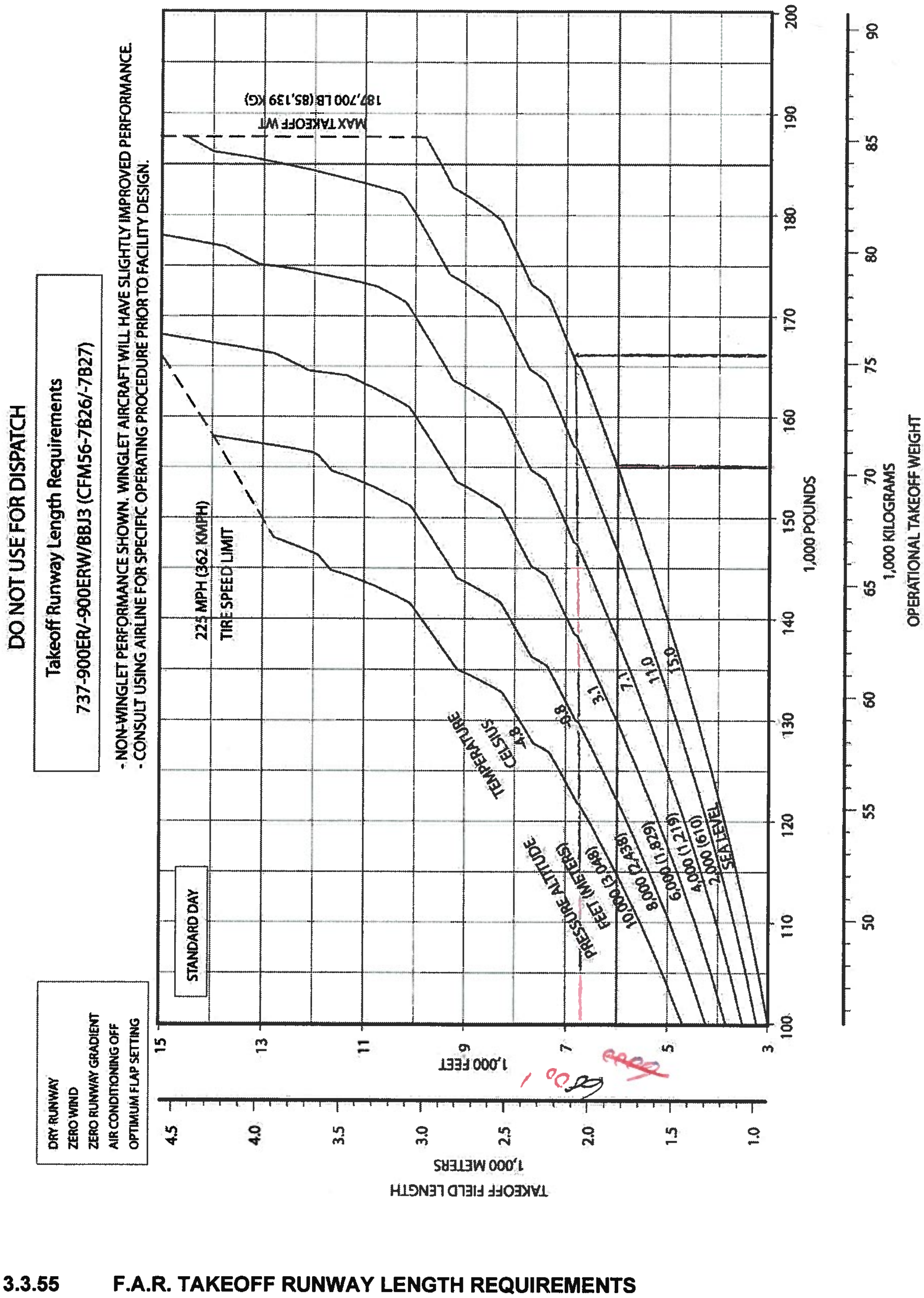


3.3.43 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS
STANDARD DAY, DRY RUNWAY
MODEL 737-700ER/-700ERW/-700C/-700CW/BBJ1 (CFM56-7B26/-7B27 ENGINES AT 26,000 LB SLST)

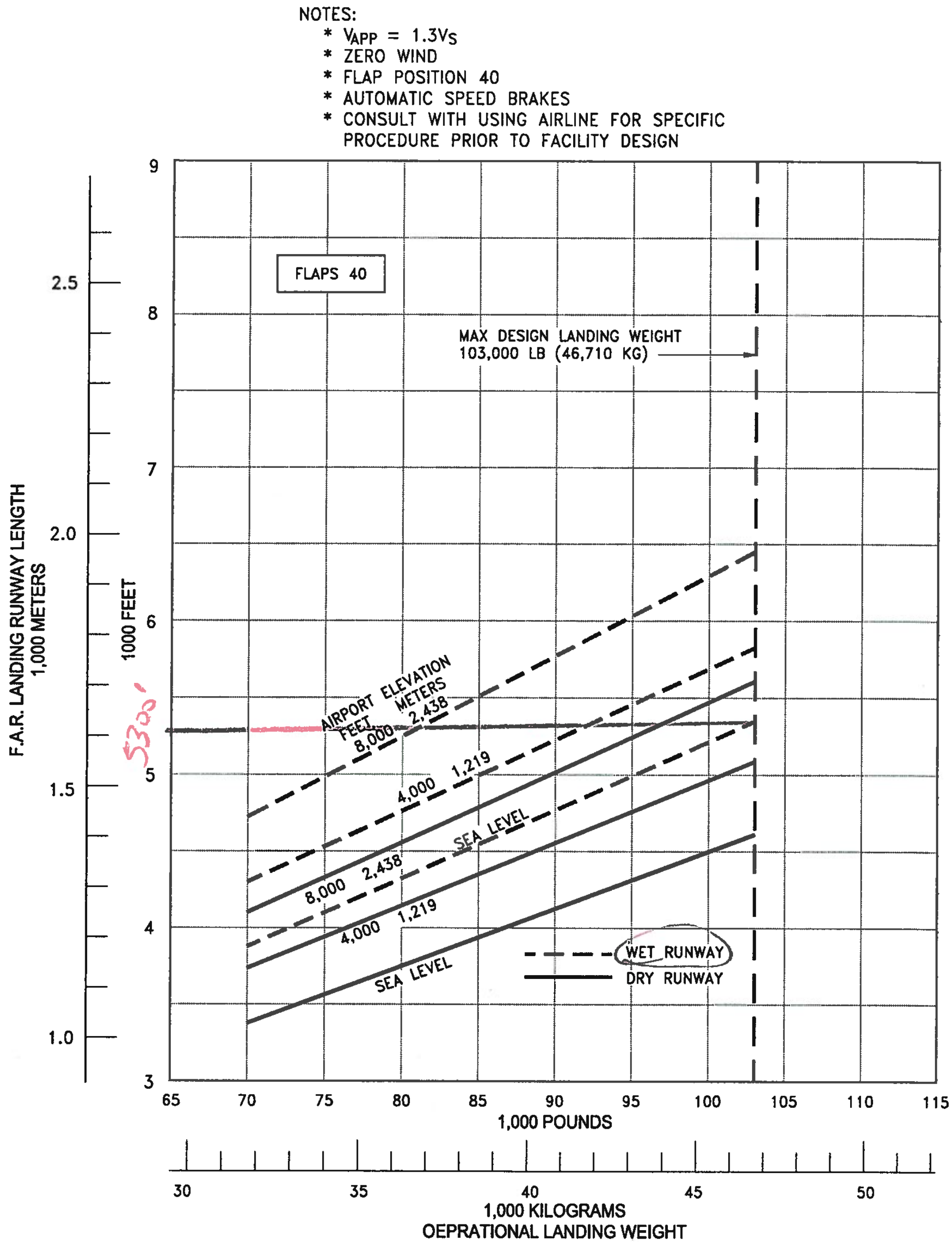


3.3.51 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS STANDARD DAY, DRY RUNWAY

MODE L 737-900/-900W (CFM56-7B24/-7B26 ENGINES AT 24,000 LB SLST)

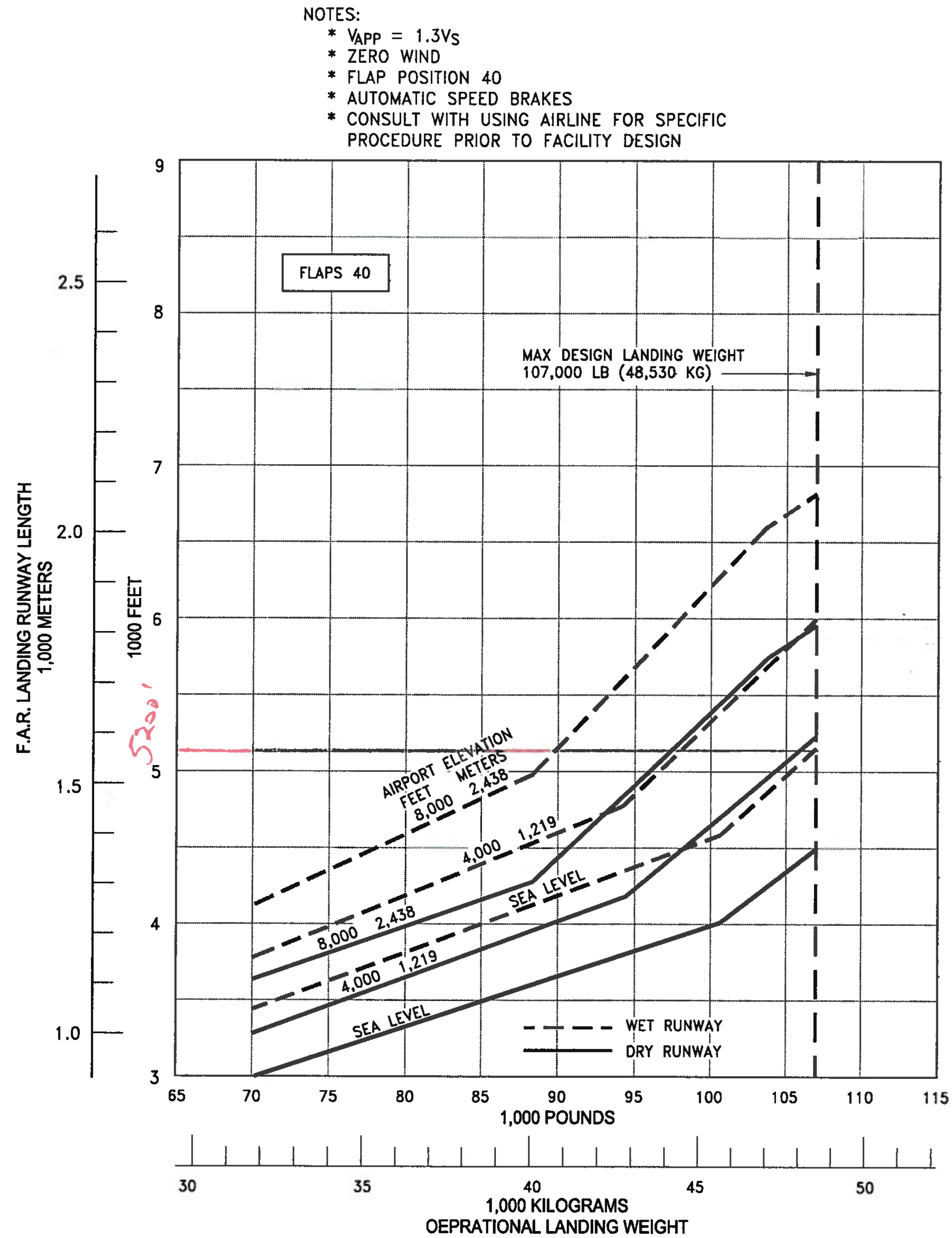


3.3.55 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS
STANDARD DAY, DRY RUNWAY
MODEL 737-900ER/-900ERW/BBJ3 (CFM56-7B26/-7B27 ENGINES AT 26,000 LB SLST)



3.4.4 F.A.R. LANDING RUNWAY LENGTH REQUIREMENTS - FLAPS 40

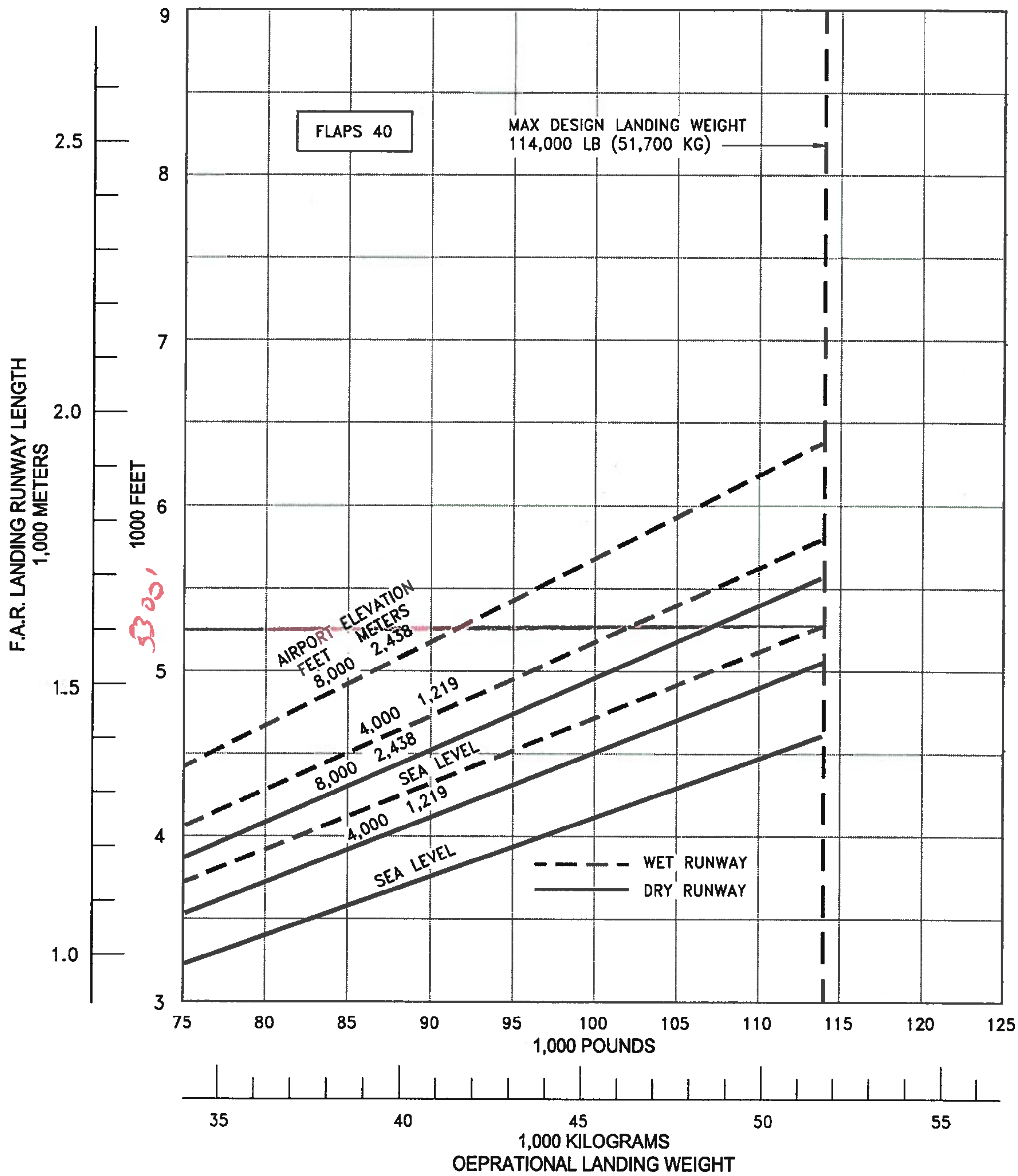
MODEL 737-200, -200C



3.4.7 F.A.R. LANDING RUNWAY LENGTH REQUIREMENTS - FLAPS 40

MODEL ADVANCED 737-200, -200C

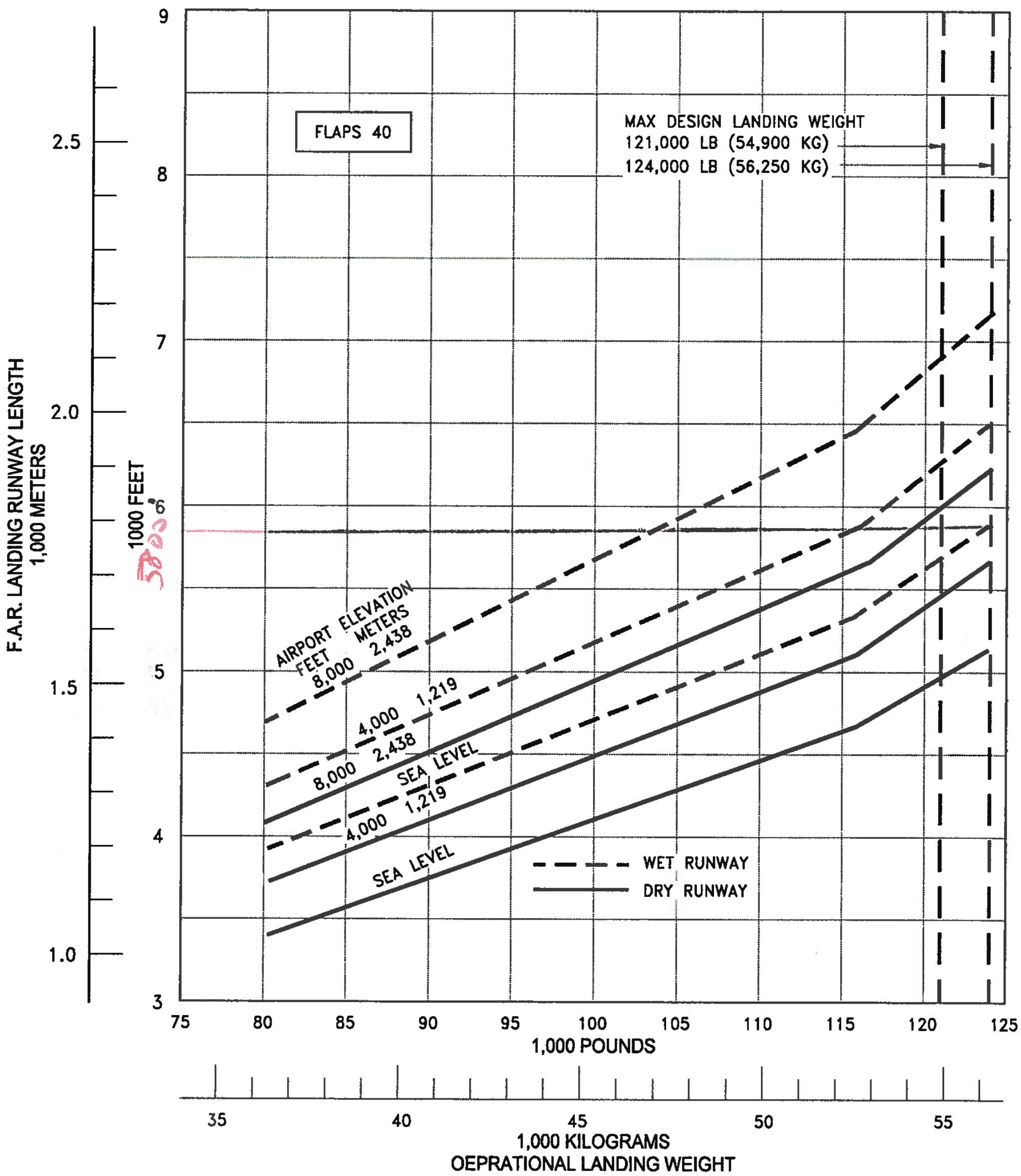
NOTES:
* $V_{APP} = 1.3V_S$
* ZERO WIND, ZERO RUNWAY GRADIENT
* FLAP POSITION 40
* AUTOMATIC SPEED BRAKES
* CONSULT WITH USING AIRLINE FOR SPECIFIC PROCEDURE PRIOR TO FACILITY DESIGN



3.4.10 F.A.R. LANDING RUNWAY LENGTH REQUIREMENTS - FLAPS 40

MODEL 737-300

NOTES:
* $V_{APP} = 1.3V_S$
* ZERO WIND, ZERO RUNWAY GRADIENT
* FLAP POSITION 40
* AUTOMATIC SPEED BRAKES
* CONSULT WITH USING AIRLINE FOR SPECIFIC PROCEDURE PRIOR TO FACILITY DESIGN



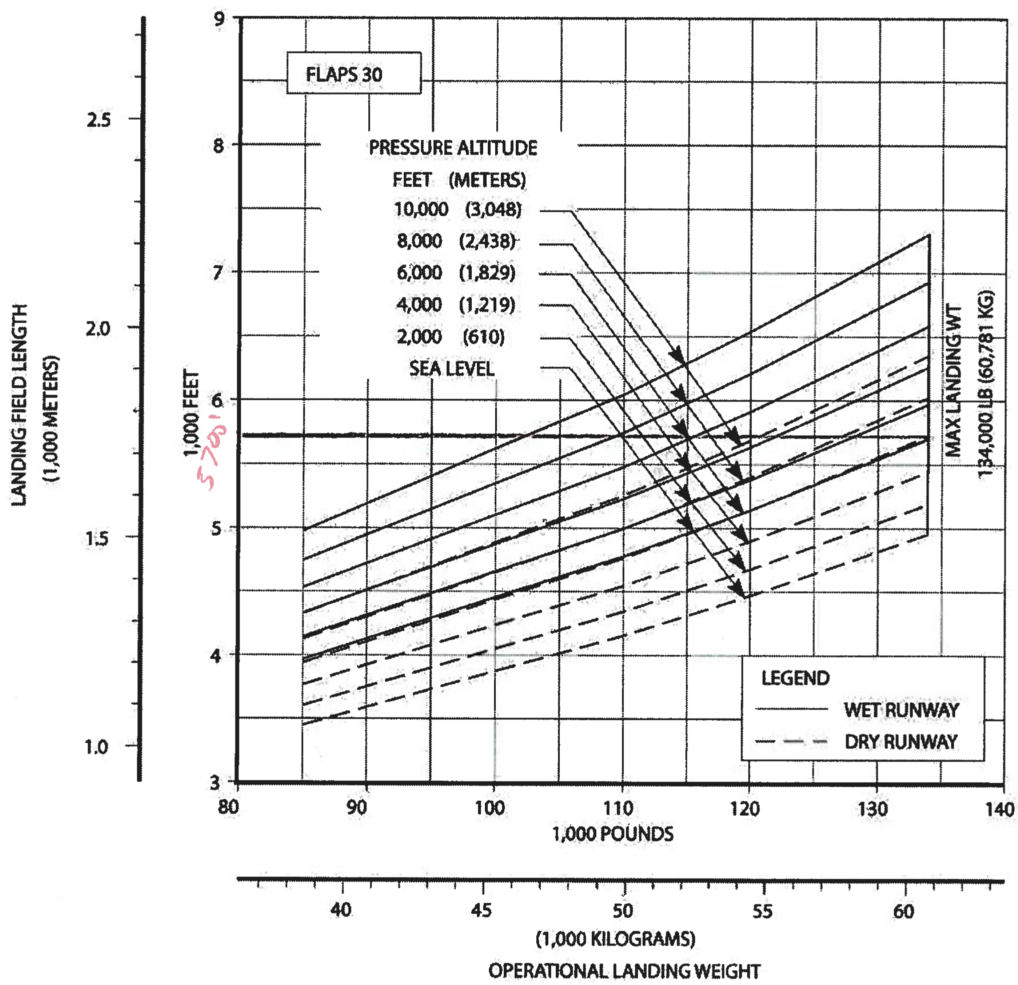
3.4.13 F.A.R. LANDING RUNWAY LENGTH REQUIREMENTS - FLAPS 40

MODEL 737-400

DO NOT USE FOR DISPATCH

Landing Field Length
737-700/-700W/-700ER/-700ERW/-700C/-700CW/BBJ1 (CFM56-7B Series)

- STANDARD DAY, ZERO WIND
- AUTO SPOILERS OPERATIVE
- ANTI-SKID OPERATIVE
- ZERO RUNWAY GRADIENT
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN

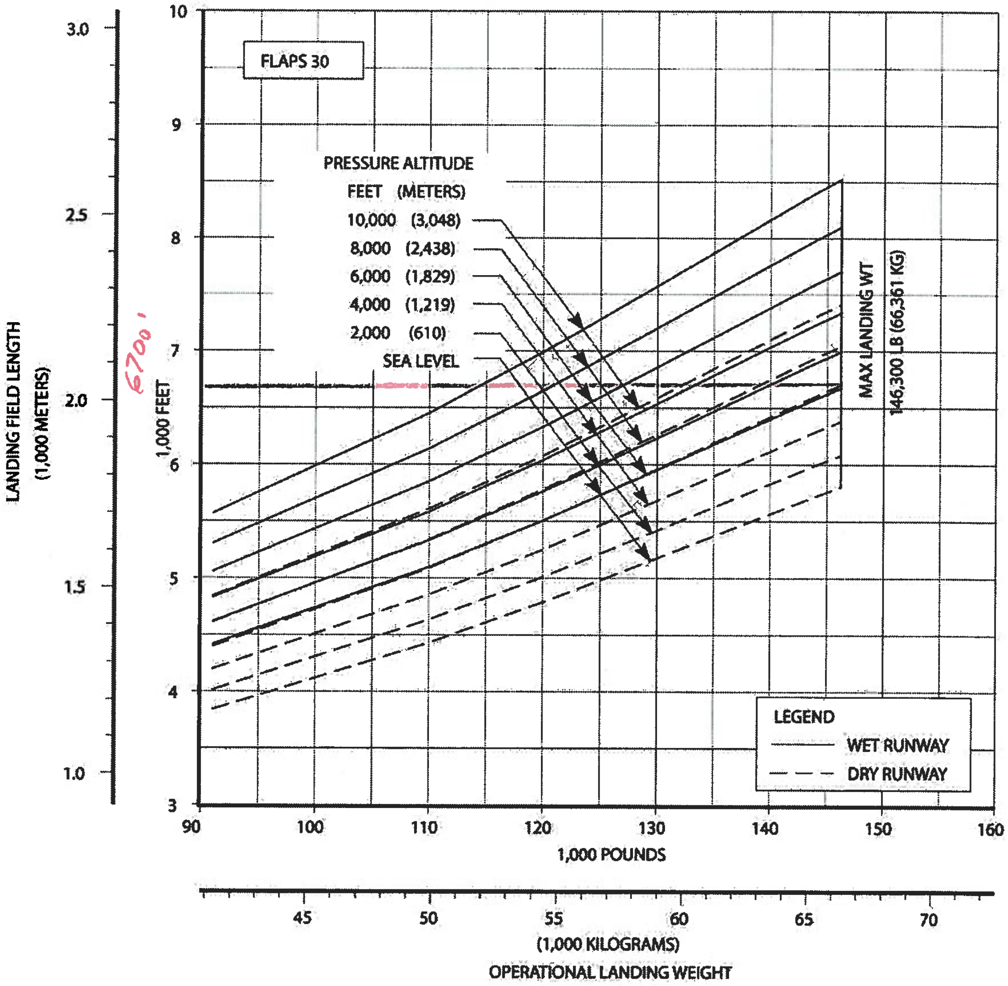


3.4.20 F.A.R. LANDING RUNWAY LENGTH REQUIREMENTS - FLAPS 30
MODEL 737-700ER

DO NOT USE FOR DISPATCH

Landing Field Length
737-800/-800W/BBJ2 (CFM56-7B Series)

- STANDARD DAY, ZERO WIND
- AUTO SPOILERS OPERATIVE
- ANTI-SKID OPERATIVE
- ZERO RUNWAY GRADIENT
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN



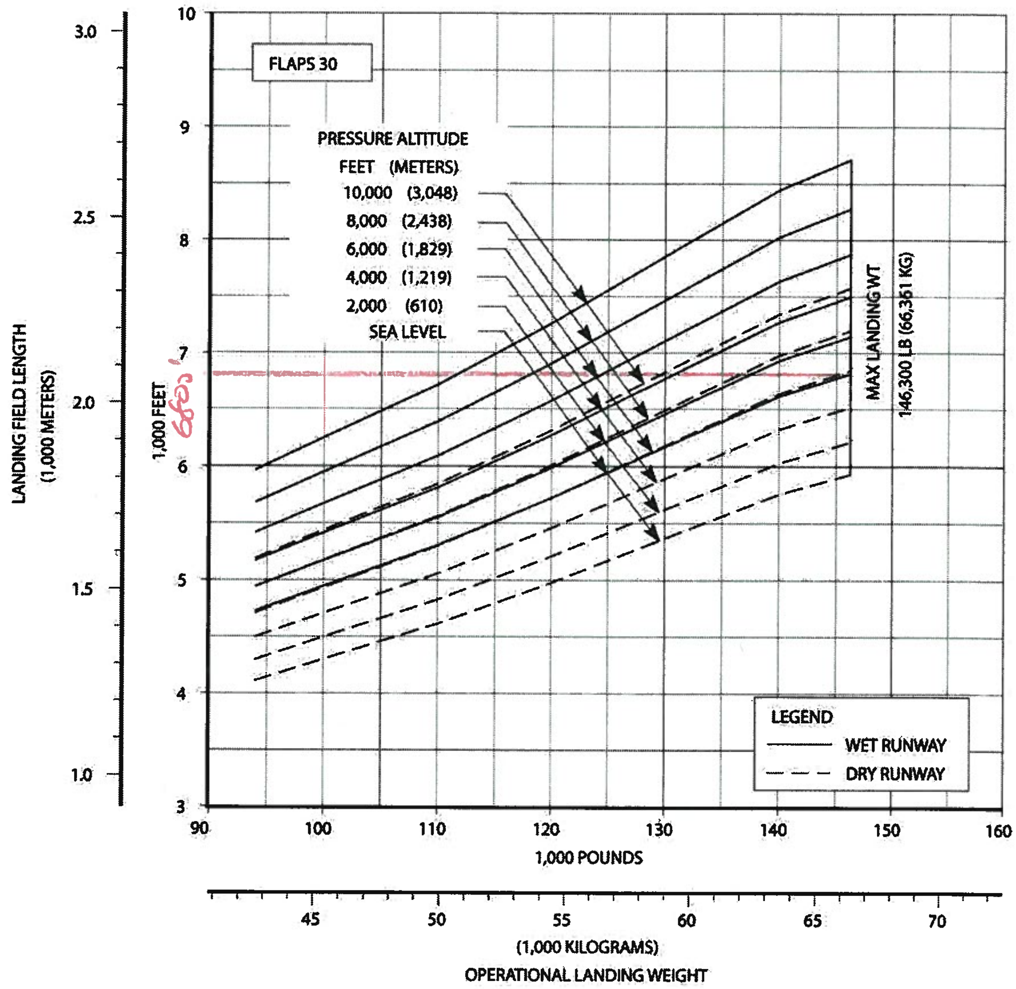
5900' = 16,500# weight penalty

3.4.21 F.A.R. LANDING RUNWAY LENGTH REQUIREMENTS - FLAPS 30
MODEL 737-800

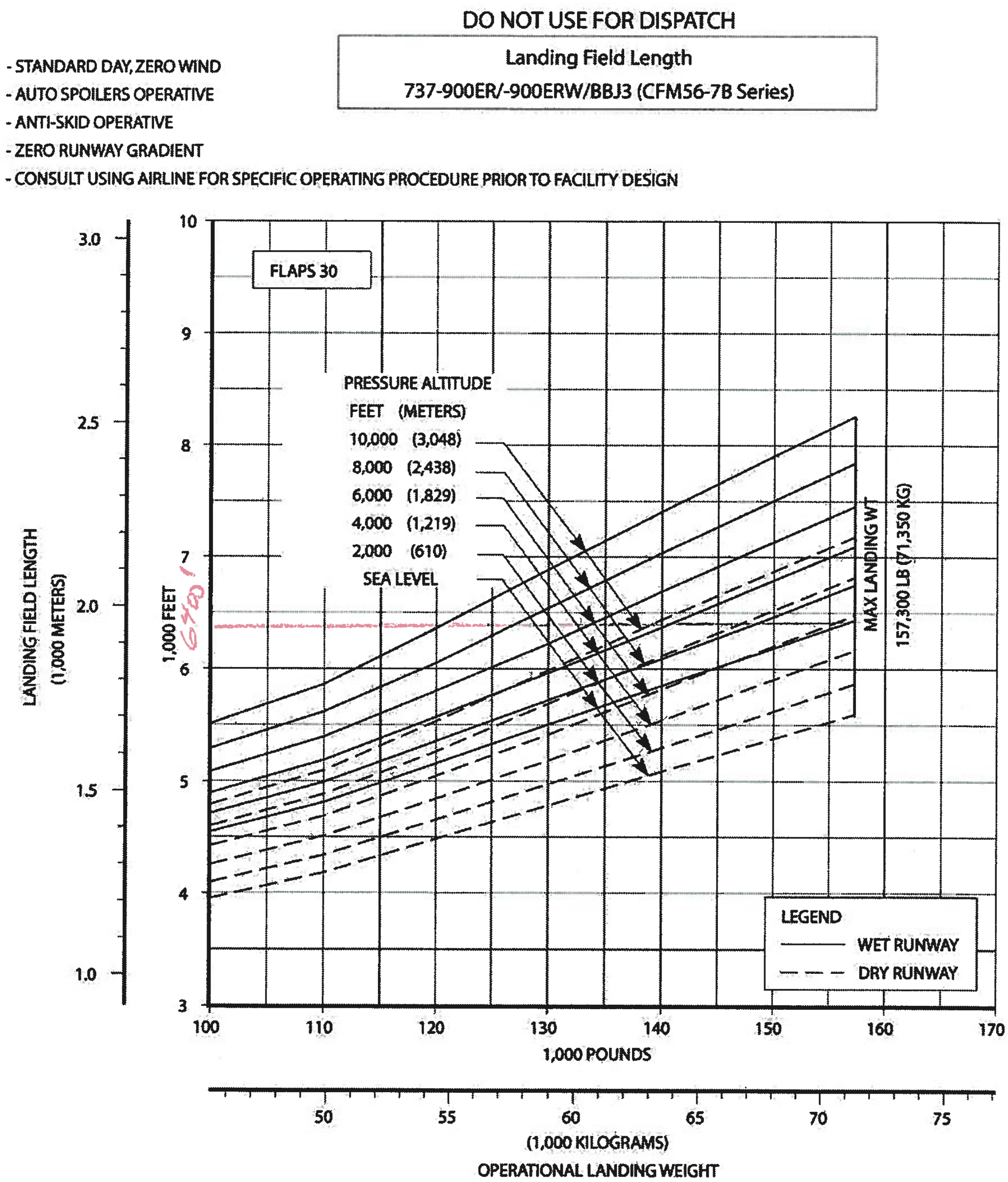
DO NOT USE FOR DISPATCH

- STANDARD DAY, ZERO WIND
- AUTO SPOILERS OPERATIVE
- ANTI-SKID OPERATIVE
- ZERO RUNWAY GRADIENT
- CONSULT USING AIRLINE FOR SPECIFIC OPERATING PROCEDURE PRIOR TO FACILITY DESIGN

Landing Field Length
737-900/-900W (CFM56-7B Series)

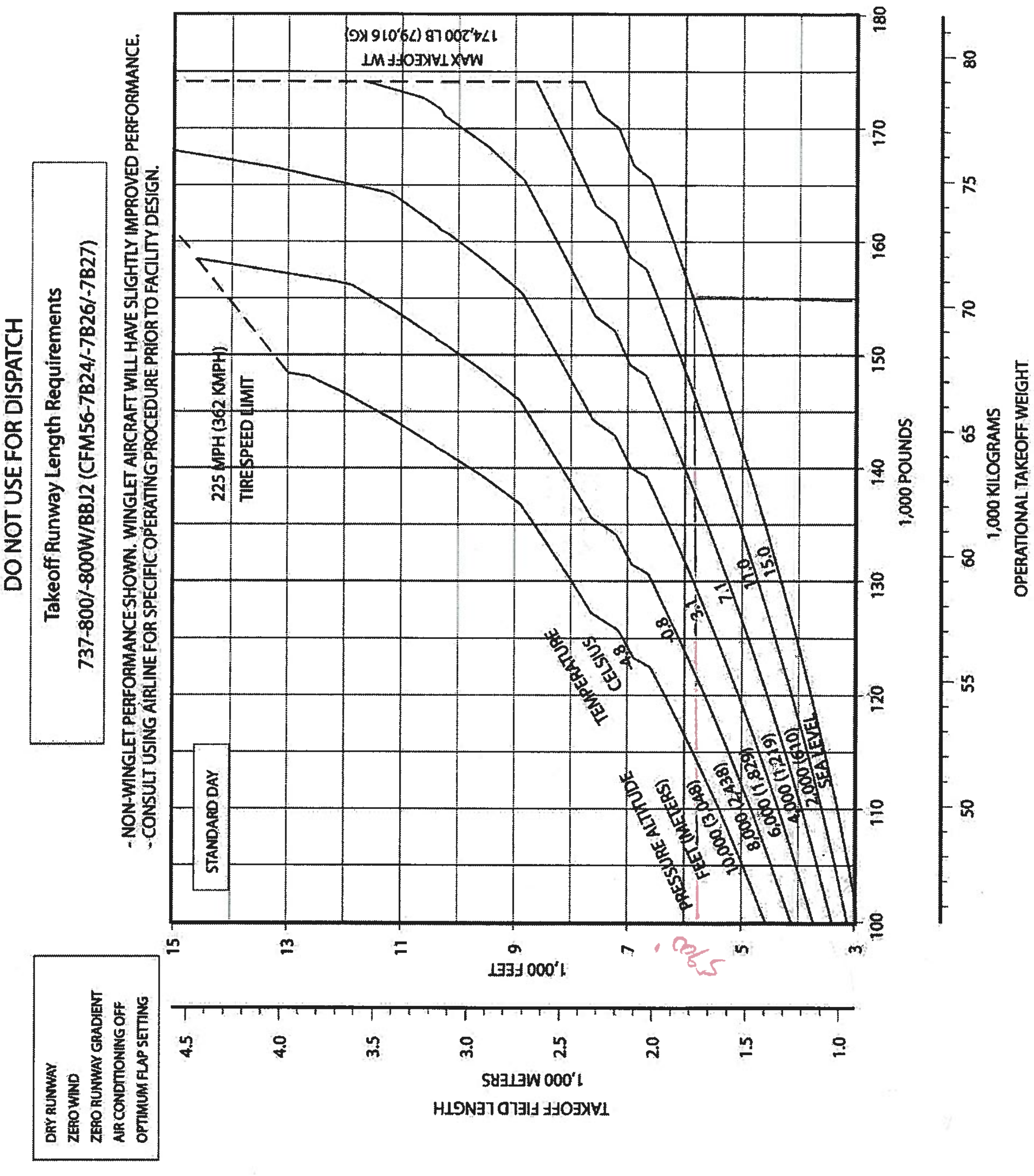


3.4.22 F.A.R. LANDING RUNWAY LENGTH REQUIREMENTS - FLAPS 30
MODEL 737-900



3.4.23 F.A.R. LANDING RUNWAY LENGTH REQUIREMENTS - FLAPS 30

MODEL 737-900ER



3.3.47 F.A.R. TAKEOFF RUNWAY LENGTH REQUIREMENTS
STANDARD DAY, DRY RUNWAY

MODEL 737-800/-800W/BBJ2 (CFM56-7B24/-7B26/-7B27 ENGINES AT 26,000 LB SLST)

Summary

Aircraft	Takeoff	Landing	Landing + 15%	Required RW	
737-200	5300	5,300	6095	6095	
737-300	5700	5,300	6095	6095	
737-400	6300	5,800	6670	6670	
737-700	6200	5,700	6555	**6555**	Near term 1-5 years
737-800	6000	6,700	7705	**7705**	Mid term 5-10 years
737-900	6900	6,400	7360	7360	

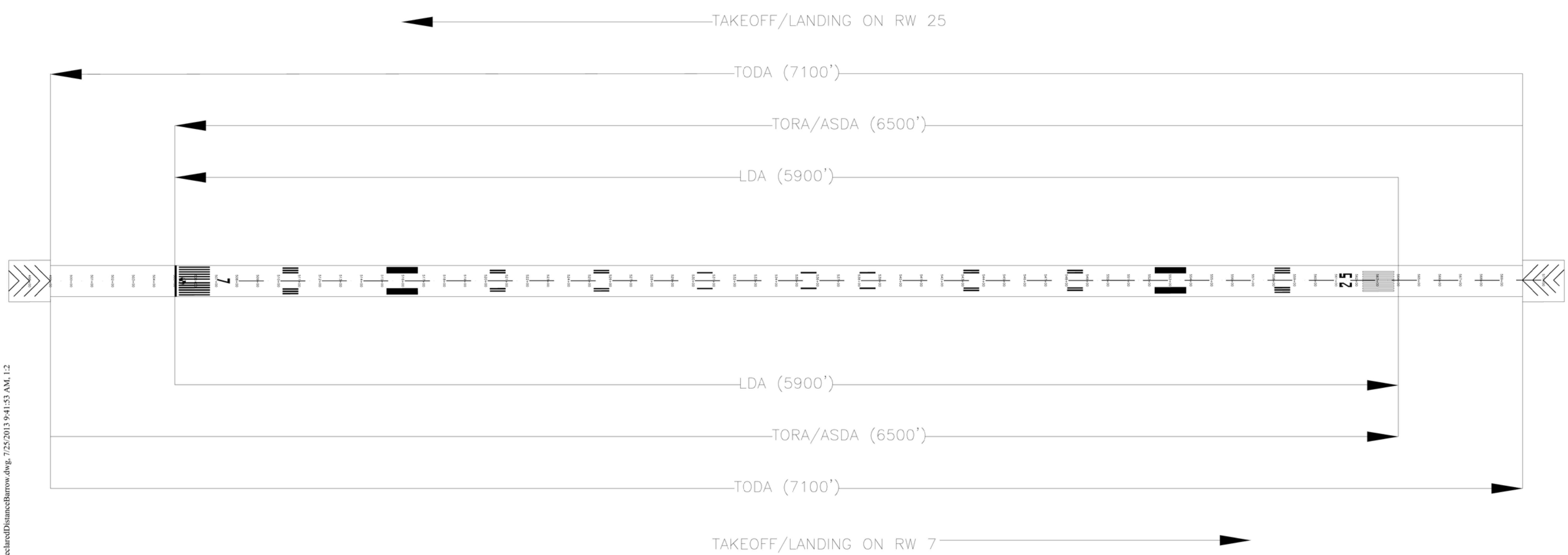
Takeoff Requirements by Aircraft
Based on Boeing Publication "737 Airplane Characteristics for Airport Planning"
http://www.boeing.com/commercial/airports/737.htm

Charts of aircraft takeoff and landing length were used to obtain the runway lengths listed below. Assumptions - takeoff weight for 630 mile stage length, elevation 0, standard day 59 deg. F, dry runway

Page #	Model	Takeoff Weight	Based on Page	Takeoff Length	Add 10'/ft of Primary RW Elev Change -	
106	737-200	112000	86	8000	8100	Not Used - Per Correspondence with NAC - max TO length required is 6300' for their aircraft
112	737-200	116000	89	5200	5300	
114	737-300	122000	90	5600	5700	
118	737-400	134000	91	6200	6300	
134	737-700	136000	94	5800	5900	
142	737-700	140000	95	6100	6200	
150	737-800	155000	96	5900	6000	
154	737-900	155000	97	6800	6900	
158	737-900	166000	98	6800	6900	

Landing Length

Page #	Model	Maximum Weigh	Flap Setting	(Wet Runway) Landing Length	Compare with Alaska Airlines Dry	Wet	G/M	Degraded Braking Action Medium	M/P	Poor
273	737-200	103,000	40	5,300						
276	737-200	107,000	40	5,200						
279	737-300	114,000	40	5,300						
282	737-400	124,000	40	5,800	5000	5,800	5200	5,900	6600	7,500
289	737-700	134000	30	5700	4800	5,500	5400	6,200	7000	8,100
290	737-800	146300	30	6700	5100	5,900	5700	6,600	7500	8,700
291	737-900	146300	30	6800	5500	6,300	6100	7,000	8000	9,200
292	737-900	157,300	30	6,400						



DECLARED DISTANCE TABLE

RUNWAY	TORA	TODA	ASDA	LDA
7	6500'	7100'	6500'	5900'
25	6500'	7100'	6500'	5900'

WILEY POST/WILL ROGERS
MEMORIAL AIRPORT
BARROW, AK

DECLARED DISTANCES FOR
RW 7/25

P:\2012\12190FB\3In_Src\Client_DOT\12y12m12d_DOT_data\0 General\02 ALP File\2011 Interim ALP Update\DeclaredDistanceBarrow.dwg, 7/25/2013 9:41:53 AM, 1:2

Taxiway Geometry Standards

Table 4-5. Standard intersection details for TDGs 3 and 4

TDGs 3 and 4								
Dimension (See Figure 4-13, Figure 4-14, Figure 4-15, and Figure 4-16)								
Δ (degrees)	30	45	60	90	120	135	150	180 [2]
W-0 (ft)	25	25	25	25	25	25	25	25
W-1 (ft)	30	30	30	30	30	35	35	35
W-2 (ft)	35	40	45	50	50	51	55	62
W-3 (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	96
L-1 (ft)	90	100	100	100	90	120	125	130
L-2 (ft)	50	55	70	80	80	50	55	60
L-3 (ft)	9	17	26	50	122	173	283	60
R-Fillet (ft)	0	0	0	0	25	25	25	20
R-CL (ft)	75	75	75	60	75	75	80	80
R-Outer TDG-3 (ft)	200	155	135	98	105	103	107	N/A
R-Outer TDG-4 (ft)	130	100	100	87	100	100	105	N/A

Note: Values in the table are rounded to the nearest foot. 1 foot = 0.305 meters.

Table 4-6. Standard intersection details for TDG 5

TDG 5								
Dimension (See Figure 4-13, Figure 4-14, Figure 4-15, and Figure 4-16)								
Δ (degrees)	30	45	60	90	120	135	150	180 [2]
W-0 (ft)	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5
W-1 (ft)	40	45	45	45	50	50	45	50
W-2 (ft)	52	60	65	65	72	73	73	88
W-3 (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	150
L-1 (ft)	100	165	180	180	210	215	180	185
L-2 (ft)	120	90	95	90	70	70	100	90
L-3 (ft)	14	25	37	103	191	276	440	96
R-Fillet (ft)	0	0	0	50	50	50	50	35
R-CL (ft)	110	110	110	95	115	120	120	120
R-Outer (ft)	350	250	200	164	160	160	160	N/A

Note: Values in the table are rounded to the nearest foot. 1 foot = 0.305 meters.

[2] This column refers to 180 degree turns between parallel taxiways. See Figure 4-16.

Table 3-8. Runway design standards matrix

Aircraft Approach Category (AAC) and Airplane Design Group (ADG):
(select from pull-down menu at right)

D – III

ITEM	DIM[1]	Visual	Not Lower than 1 mile	Not Lower than 3/4 mile	Lower than 3/4 mile
Runway Design					
Runway Length	A	*Refer to paragraphs 302 and 304*			
Runway Width [13]	B	150 ft	150 ft	150 ft	150 ft
Shoulder Width [13]		25 ft	25 ft	25 ft	25 ft
Blast Pad Width [13]		200 ft	200 ft	200 ft	200 ft
Blast Pad Length		200 ft	200 ft	200 ft	200 ft
Crosswind Component		16 knots	16 knots	16 knots	16 knots
Runway Protection					
Runway Safety Area (RSA)					
Length beyond departure end [10, 11]	R	1000 ft	1000 ft	1000 ft	1000 ft
Length prior to threshold [12]	P	600 ft	600 ft	600 ft	600 ft
Width	C	500 ft	500 ft	500 ft	500 ft
Runway Object Free Area (ROFA)					
Length beyond runway end	R	1000 ft	1000 ft	1000 ft	1000 ft
Length prior to threshold [12]	P	600 ft	600 ft	600 ft	600 ft
Width	Q	800 ft	800 ft	800 ft	800 ft
Runway Obstacle Free Zone (ROFZ)					
Length		*Refer to paragraph 308*			
Width		*Refer to paragraph 308*			
Precision Obstacle Free Zone (POFZ)					
Length		N/A	N/A	N/A	200 ft
Width		N/A	N/A	N/A	800 ft
Approach Runway Protection Zone (RPZ)					
Length	L	1700 ft	1700 ft	1700 ft	2500 ft
Inner Width	U	500 ft	500 ft	1000 ft	1000 ft
Outer Width	V	1010 ft	1010 ft	1510 ft	1750 ft
Acres		29.465	29.465	48.978	78.914
Departure Runway Protection Zone (RPZ)					
Length	L	1700 ft	1700 ft	1700 ft	1700 ft
Inner Width	U	500 ft	500 ft	500 ft	500 ft
Outer Width	V	1010 ft	1010 ft	1010 ft	1010 ft
Acres		29.465	29.465	29.465	29.465
Runway Separation					
Runway centerline to:					
Parallel runway centerline	H	*Refer to paragraph 316*			
Holding position [7]		250 ft	250 ft	250 ft	250 ft
Parallel Taxiway/Taxilane centerline [2]	D	400 ft	400 ft	400 ft	400 ft
Aircraft parking area	G	500 ft	500 ft	500 ft	500 ft
Helicopter touchdown pad		Refer to AC 150/5390-2			

Notes:

- Appendix 7 contains non-interactive tables for all RDCs.
- Values in the table are rounded to the nearest foot. 1 foot = 0.305 meters.

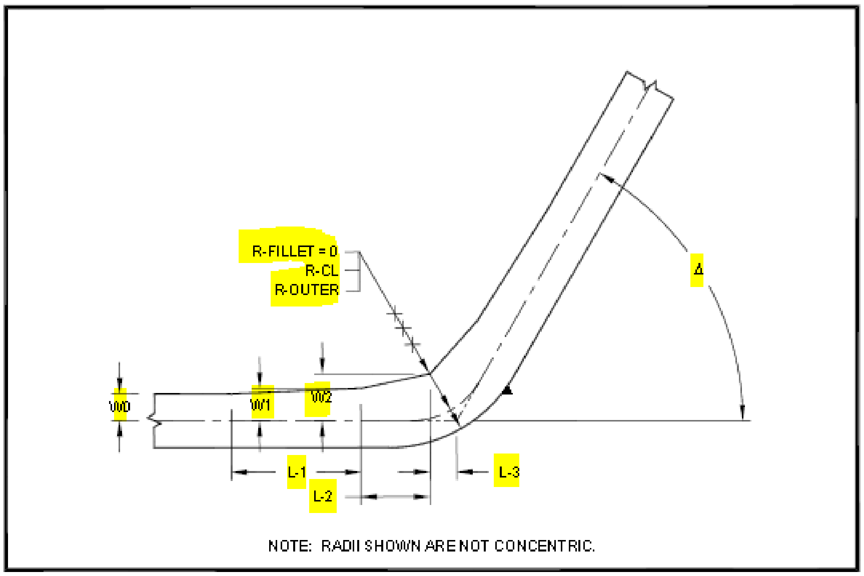


Figure 4-14. Less than 90 degree delta

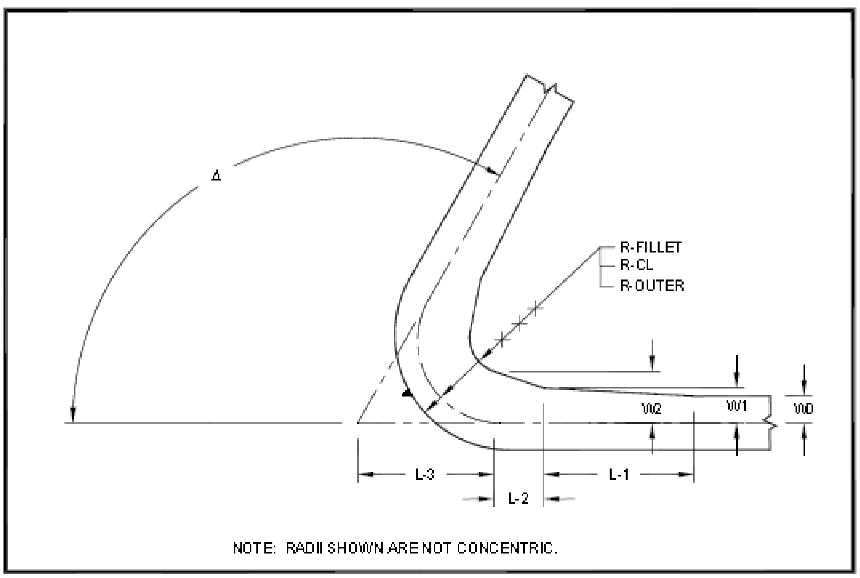


Figure 4-15. Greater than 90 degree delta

(4) Intersection Angles. Design turns to be 90 degrees wherever possible. For intersections, standard angles (deltas) of 30, 45, 60, 90, 120, 135, and 150 degrees are preferred. Angles other than standard will require specific design based on the criteria in paragraphs 401.b(1), 401.b(2), and 401.b(3). See paragraph 406.b for guidance on fillet design. See Figure 4-2.

(5) Runway Incursions. As noted in paragraph 203, the airport designer must keep basic concepts in mind to reduce the probability of runway incursions through proper airport geometry. This is particularly important when designing a taxiway system. Some of these basic concepts that apply to taxiway design are detailed below. Examples of confusing intersections to be avoided are shown in Figure 4-5 and Figure 4-6. Intersections prone to wrong-runway takeoffs are not recommended for construction. These and other existing nonstandard conditions should be corrected as soon as practicable.

(a) Increase Pilot Situational Awareness. A pilot who knows where he/she is on the airport is less likely to enter a runway improperly. Complexity leads to confusion. Keep taxiway systems simple, using the "three-node" concept.

(b) Avoid wide expanses of pavement. Taxiway to runway interface encompassing wide expanses of pavement is not recommended. Wide pavements require placement of signs far from a pilot's eye and reduce the conspicuity of other visual cues. Under low visibility conditions or due to pilot focus on the centerline, signs can be missed. This is especially critical at runway entrance points. Where a wide expanse of pavement is unavoidable, such as a crossover providing for a 180 degree turn between parallel taxiways, avoid direct access to a runway.

(c) Limit runway crossings. The airport designer can reduce the opportunity for human error by reducing the need for runway crossings. The benefits of such design are twofold – through a simple reduction in the number of occurrences, and through a reduction in air traffic controller workload.

(d) Avoid "high energy" intersections. These are intersections in the middle third of the runways. By limiting runway crossings to the outer thirds of the runway, the portion of the runway where a pilot can least maneuver to avoid a collision is kept clear.

(e) Increase visibility. Right angle intersections, both between taxiways and between taxiways and runways, provide the best visibility to the left and right for a pilot. Acute angle runway exits provide for greater efficiency in runway usage, but should not be used as runway entrance or crossing points. A right angle turn at the end of a parallel taxiway is a clear indication of approaching a runway.

(f) Avoid "dual purpose" pavements. Runways used as taxiways and taxiways used as runways can lead to confusion. A runway should always be clearly identified as a runway and only a runway.

(g) Indirect Access. Do not design taxiways to lead directly from an apron to a runway. Such configurations can lead to confusion when a pilot typically expects to encounter a parallel taxiway. See Figure 4-5 and Figure 4-6.

Table 4-1. Design standards based on Airplane Design Group (ADG)

ITEM	DIM (See Figure 3-26)	ADG					
		I	II	III	IV	V	VI
TAXIWAY PROTECTION							
TSA	E	49 ft (15 m)	79 ft (24 m)	118 ft (36 m)	171 ft (52 m)	214 ft (65 m)	262 ft (80 m)
Taxiway OFA		89 ft (27 m)	131 ft (40 m)	186 ft (57 m)	259 ft (79 m)	320 ft (98 m)	386 ft (118 m)
Taxilane OFA		79 ft (24 m)	115 ft (35 m)	162 ft (49 m)	225 ft (69 m)	276 ft (84 m)	334 ft (102 m)
TAXIWAY SEPARATION							
Taxiway Centerline to Parallel Taxiway/Taxilane Centerline [1]	J	70 ft (21 m)	105 ft (32 m)	152 ft (46.5 m)	215 ft (65.5 m)	267 ft (81 m)	324 ft (99 m)
Taxiway Centerline to Fixed or Movable Object	K	44.5 ft (13.5 m)	65.5 ft (20 m)	93 ft (28.5 m)	129.5 ft (39.5 m)	160 ft (48.5 m)	193 ft (59 m)
Taxilane Centerline to Parallel Taxilane Centerline [1]		64 ft (19.5 m)	97 ft (29.5 m)	140 ft (42.5 m)	198 ft (60 m)	245 ft (74.5 m)	298 ft (91 m)
Taxilane Centerline to Fixed or Movable Object		39.5 ft (12 m)	57.5 ft (17.5 m)	81 ft (24.5 m)	112.5 ft (34 m)	138 ft (42 m)	167 ft (51 m)
WINGTIP CLEARANCE							
Taxiway Wingtip Clearance		20 ft (6 m)	26 ft (8 m)	34 ft (10.5 m)	44 ft (13.5 m)	53 ft (16 m)	62 ft (19 m)
Taxilane Wingtip Clearance		15 ft (4.5 m)	18 ft (5.5 m)	23 ft (6.5 m)	27 ft (8 m)	31 ft (9.5 m)	36 ft (11 m)

Note: 1. These values are based on wingtip clearances. If 180 degree turns between parallel taxiways are needed, use this dimension or the dimension specified in Table 4-2, whichever is larger.

Table 4-2. Design standards based on Taxiway Design Group (TDG)

ITEM	DIM (See Figure 4-7)	TDG						
		1	2	3	4	5	6	7
Taxiway Width	W	25 ft (7.5 m)	35 ft (10.5 m)	50 ft (15 m)	50 ft (15 m)	75 ft (23 m)	75 ft (23 m)	82 ft (25 m)
Taxiway Edge Safety Margin	M	5 ft (1.5 m)	7.5 ft (2 m)	10 ft (3 m)	10 ft (3 m)	15 ft (5 m)	15 ft (5 m)	15 ft (5 m)
Taxiway Shoulder Width		10 ft (3 m)	10 ft (3 m)	20 ft (6 m)	20 ft (6 m)	25 ft (7.5m)	35 ft (10.5 m)	40 ft (12 m)
Taxiway/Taxilane Centerline to Parallel Taxiway/Taxilane Centerline [1]	J	70 ft (21 m)	70 ft (21 m)	160 ft (49 m)	160 ft (49 m)	240 ft (73 m)	350 ft (107 m)	350 ft (107 m)
TAXIWAY FILLET DIMENSIONS		See Table 4-3, Table 4-4, Table 4-5, Table 4-6, Table 4-7 and Table 4-8						

Note: 1. Use this dimension or the dimension specified in Table 4-1, whichever is larger, when 180 degree turns between parallel taxiways are required.

Manu-facturer	Aircraft	AAC	ADG	TDG	Wing-span	Tail Height	Length	CMG	Wheel-base	MGW Outer to Outer	MTOW	V_{REF}/ Approach Speed
					ft (m)	ft (m)	ft (m)	ft (m)	ft (m)	ft (m)	lbs (kg)	kts
Bombardier	Q400	C	III	5	93.3 (28.5)	27.4 (8.4)	107.8 (32.9)	- -	45.8 (14.0)	33.2 (10.1)	65,200 (29636)	129
Boeing	707-320B	C	IV	5	145.8 (44.4)	42.1 (12.8)	152.9 (46.6)	68.4 (20.85)		26.3 (8.02)	333,600 (151319)	128
Boeing	717-200	C	III	3	93.2 (28.40)	29.8 (9.08)	124.0 (37.80)	55.8 (17.00)	57.8 (17.62)	19.4 (5.90)	121,000 (54,885)	139
Boeing	717-200HGW	C	III	3	108.0 (32.9)	34.3 (10.4)	133.2 (40.6)	55.90 (17.04)		22.9 (6.98)	121,000 (54885)	139
Boeing	727-100	C	III	3	108.0 (32.90)	34.3 (10.40)	133.2 (40.60)	60.20 (18.34)		23.0 (7.01)	160,000 (72575)	124
Boeing	727-200	C	III	5	107.9 (32.9)	34.9 (10.64)	153.2 (46.7)	70.2 (21.40)	63.3 (19.29)	23.3 (7.10)	210,000 (95254)	133
Boeing	727-200/W	C	III	5	109.3 (33.30)	34.9 (10.64)	153.2 (46.70)	70.2 (21.40)	63.3 (19.29)	23.3 (7.10)	210,000 (95,254)	136
Boeing	737-100	C	III	3	93.0 (28.3)	37.2 (11.3)	94.0 (28.7)	39.1 (11.93)	-	20.9 (6.36)	110,000 (49895)	136
Boeing	737-200	C	III	3	93.2 (28.40)	36.8 (11.22)	100.1 (30.50)	42.7 (13.00)	37.3 (11.37)	21.0 (6.40)	128,600 (58332)	133
Boeing	737-300	C	III	3	94.8 (28.9)	36.6 (11.16)	109.6 (33.4)	45.9 (14.00)	40.8 (12.44)	21.0 (6.40)	138,500 (62823)	133
Boeing	737-300/W	C	III	3	102.4 (31.20)	36.6 (11.16)	109.6 (33.40)	45.9 (14.00)	40.8 (12.44)	21.0 (6.40)	138,500 (62,823)	133
Boeing	737-400	C	III	3	94.8 (28.9)	36.6 (11.16)	119.4 (36.40)	52.2 (15.90)	40.8 (12.44)	21.0 (6.40)	150,000 (68039)	139
Boeing	737-500	C	III	3	94.8 (28.9)	36.6 (11.16)	101.7 (31.0)	41.7 (12.70)	36.3 11.6	21.0 (6.40)	133,500 (60555)	128
Boeing	737-500/W	C	III	3	102.0 (31.10)	36.6 (11.16)	101.7 (31.00)	41.7 (12.70)	36.3 (11.06)	21.0 (6.40)	133,500 (60555)	128
Boeing	737-600	C	III	3	112.5 (34.30)	41.7 (12.71)	102.4 (31.20)	42.0 (12.80)	36.8 (11.22)	23.0 (7.00)	143,500 (65091)	125
Boeing	737-700	C	III	3	112.5 (34.30)	41.7 (12.71)	110.2 (33.60)	46.6 (14.20)	41.3 (12.59)	23.0 (7.00)	154,500 (70080)	130
Boeing	737-700W	C	III	3	117.5 (35.80)	41.7 (12.71)	110.2 (33.60)	46.6 (14.20)	41.3 (12.59)	23.0 (7.00)	154,500 (70080)	130
Boeing	737-800	D	III	3	112.5 (34.30)	41.2 (12.56)	129.6 (39.50)	56.4 (17.20)	51.2 (15.61)	23.0 (7.00)	174,200 (79016)	142
Boeing	737-800W	D	III	3	117.5 (35.80)	41.2 (12.56)	129.6 (39.50)	56.4 (17.20)	51.2 (15.61)	23.0 (7.00)	174,200 (79016)	142
Boeing	737-900	D	III	3	112.5 (34.30)	41.2 (12.56)	138.1 (42.10)	61.7 (18.80)	56.3 (17.16)	23.0 (7.00)	174,200 (79016)	141
Boeing	737-900W	D	III	3	117.4 (35.8)	41.4 (12.6)	138.2 (42.1)	61.6 (18.78)		23 (7.00)	174,200 (79016)	141
Boeing	737-900ER	D	III	3	112.6 (34.3)	41.4 (12.6)	138.2 (42.1)	61.6 (18.78)		23 (7.00)	187,700 (85139)	141
Boeing	737-900ERW	D	III	3	117.5 (35.80)	41.2 (12.56)	138.1 (42.10)	61.7 (18.80)	56.3 (17.16)	23.0 (7.00)	187,200 (84912)	141

Table 3-4. Standards for Precision Approach Procedures with Vertical Guidance (APV) Lower than 250 ft Height Above Threshold (HATh)

Visibility Minimums[1]	< 3/4-statute mile	< 1-statute mile
HATh[2]	200 ft	250 ft
TERPS GQS[3]	Table 3-2, row 8 Clear	
TERPS precision final surfaces	Clear	See Note 4
TERPS Chapter 3, Section 3	34:1 Clear	20:1 Clear
Precision Obstacle Free Zone (POFZ) 200 ft × 800 ft	Required	Not Required
ALP[5]	Required	
Minimum Runway Length	4,200 ft (Paved)	
Runway Markings (See AC 150/5340-1)	Precision	Non-precision
Holding Position Signs and Markings (See AC 150/5340-1 and AC 150/5340-18)	Precision	Non-precision
Runway Edge Lights[6]	HIRL / MIRL	
Parallel Taxiway[7]	Required	
Approach Lights[8]	MALSR, SSALR, or ALSF	Recommended
Applicable Runway Design Standards; e.g., OFZ	< 3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums
Threshold Siting Criteria To Be Met[9]	Reference paragraph 303 and Table 3-2, rows 7 & 8	Reference paragraph 303 and Table 3-2, rows 6 & 8
Survey Required for Lowest Minimums	Vertically Guided Airport Airspace Analysis Survey criteria in AC 150/5300-18	

Notes:

1. Visibility minimums are subject to application of Order 8260.3 ("TERPS"), and associated orders or this table, whichever are higher.
2. The HATh indicated is for planning purposes only. Actual obtainable HATh is determined by TERPS.
3. The GQS is applicable to approach procedures providing vertical path guidance.
4. If the final surface is penetrated, HATh and visibility will be increased as required by TERPS.
5. An ALP is only required for airports in the NPIAS; it is recommended for all others.
6. Runway edge lighting is required for night minimums. High intensity lights are required for RVR-based minimums.
7. A full-length parallel taxiway meeting separation requirements. See Table 3-8.
8. To achieve lower visibility minimums based on credit for lighting, an approach light system is required.
9. Circling procedures to a secondary runway from the primary approach will not be authorized when the secondary runway does not meet threshold siting (reference paragraph 303), OFZ (reference paragraph 308) criteria, and TERPS Chapter 3, Section 3.

APPENDIX C

Public Participation

Constant Contact <support@constantcontact.com> February 18, 2013 4:40 PM
To: a.brooks@brooks-alaska.com
Reply-To: support@constantcontact.com
Your email Barrow Airport Master Plan Update Open House Invitation - Tuesday February 26th, 2013 has been sent

Email Confirmation

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Connect. Inform. Grow.

Dear Anne Brooks,

Your email, named Barrow Airport Master Plan Update Open House February 26th, 2013 Invitation, was sent on 02/18/2013 around 8:40 PM EST.

Below is a copy of the HTML version your contacts received. Don't forget, you can easily monitor the effectiveness of your email with real-time metrics and stats. Log in to your Constant Contact account and visit the **Reports** area under the Emails tab.

Subject: Barrow Airport Master Plan Update Open House Invitation - Tuesday February 26th, 2013

Barrow Airport Master Plan Update

AKSAS Project No. 61974

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to attend an Open House Public Scoping Meeting to receive information on the Barrow Airport Master Plan Update.

Public Open House

When: Tuesday, February 26th, 2013
Where: North Slope Borough Assembly Chambers, 1274 Agvik

St, Barrow
Time: Stop by any time between 4 and 8 PM, presentations at 4:30 and 6:30 PM

Refreshments will be provided.

The State of Alaska Department of Transportation & Public Facilities (ADOT&PF) is updating the master plan for the Barrow Airport, a primary airport that serves as the main hub for the North Slope Borough, Barrow, and surrounding communities.

We want your input on this project. Looking into the future, how can the airport be improved to better serve your needs - whether it be travel, cargo or medical transport, or as a vehicle to bring economic opportunities to Barrow?

Visit the project website dot.alaska.gov/nreg/barrowmp to learn more about the project and schedule.

For additional information contact:
Public Involvement Coordinator
Anne Brooks
Brooks & Associates
Toll free: 1-907-535-1877
Tel: 1-907-272-1877
Email: mycomments@brooks-alaska.com

Individuals with a hearing impairment can contact Relay Alaska at 711 or 1-800-770-8973 (TTY) for telephone device for the deaf (TDD) services. ADOT&PF is able to offer, upon request, reasonable accommodations for special needs related to other disabilities.

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02/14/13

and that such newspaper was regularly distributed to its subscribers during all of said period. That the full amount of the fee charged for the foregoing publication is not in excess of the rate charged private individuals.

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Me this 14 day of Feb

20 13

Britney Thompson

Notary Public in and for
The State of Alaska.
Third Division
Anchorage, Alaska
MY COMMISSION EXPIRES

05/18/15

Barrow Airport Master Plan Update

AKSAS Project No. 61974

The State of Alaska Department of Transportation & Public Facilities (ADOT&PF) is updating the master plan for the Barrow Airport, a primary, commercial airport that serves as the main hub for the North Slope Borough, Barrow, and surrounding communities.

We want your input on this project. Looking into the future, how can the airport be improved to better serve your needs - whether it be travel, cargo or medical transport, or as a vehicle to bring economic opportunities to Barrow?

For more information contact:

Brooks & Associates
Anne Brooks, P.E.Public Involvement Lead
1704 Bannister Road
Anchorage, AK 99508-4021
Toll free: 1-866-535-1877
E-mail: mycomments@brooks-alaska.com

Public Open House
Tuesday February 26 2013

4-8:00 pm
Presentations at 4:30 & 6:30 pm

North Slope Borough
Assembly Chambers
1274 Agvik St.
Barrow

Come to the ADOT&PF public open house. Visit the Web site (see link below) and send the team an email or complete our online survey by clicking on the link on the web site.

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STATE OF ALASKA

Saturday mail delivery gets the ax

BY HANNAH HEIMBUCH
Arctic Sounder

The United States Postal Service announced plans last week to trim its delivery schedule down to a five-day week, eliminating all Saturday deliveries except packages.

The Postal Service lost $15.9 billion in the past fiscal year, a trend that's been a consistent burden since the Internet began to change the way people communicate. Everything from business to personal correspondence has seen a significant shift, and the Postal Service has decided this is the appropriate, albeit controversial, response. One they hope will save them $2 billion a year.

Alaska's Senator Mark Begich has joined the outspoken opposition to this decision, calling it "bad news for Alaska."

He's disappointed in the halt to Saturday delivery, as well as the choice to circumvent the legislative process in making the decision.

"This is bad news for Alaskans and small business owners who rely on timely delivery to rural areas," Sen. Begich said in a release. "This decision to end Saturday delivery will undoubtedly slow overall delivery time. The Postal Service should have allowed Congress to address this issue through the legislative process."

The service chose to keep up package delivery because, unlike the steep drop in numbers that letters and magazines have seen, the number of packages has increased in past years. The agency credits an increase in online purchasing for the 14 percent raise in package deliveries.

Begich argues that the many seniors and small business owners, particularly in Alaska, who rely on the service for invoices, financial statements and social security checks will face unfair delays.

A reform bill that passed the Senate last year but died in the House would have helped the Postal Service's current situation, Begich said. It aimed to both protect the current services and relieve some of the financial stress the department faces. That stress includes a 2006 requirement-by-law to pre-fund health benefits for its retirees, a more than $5 billion burden that no other agency pays. The reform bill would have "rectified" that requirement, Begich said, as well as prevented the current Saturday cut from taking place for two years while they sought additional funds.

"We wouldn't be in this situation if the House had done its job and passed a bill," Sen. Begich said. "I will continue working to protect postal services and post offices for Alaskans. While today's announcement doesn't affect Bypass Mail, we need to pass a comprehensive bill that protects that program and our rural post offices over the long term."

Bypass Mail is the subsidized mail delivery that allows rural Alaskans to pay regular postage rates despite the high cost of transporting deliveries into Alaska's extensive Bush community. Supporters of a more aggressive money-saving method have long eyed Bypass Mail as a candidate for the chopping block.

Sen. Begich is a member of the Senate Homeland Security and Government Affairs Committee, which has jurisdiction over postal reform legislation.

Hannah Heimbuch can be reached at hheimbuch@reportalaska.com.

Kotzebue youth nominated for spirit awards

BY HANNAH HEIMBUCH
Arctic Sounder

Two of Kotzebue's young men have been recognized for their contributions to the community, receiving nominations for spirit of youth awards for 2013. The awards have been given out every year since 1997, and aim to promote Alaska's positive teenage role models in the media.

This year, freshman Justin Scott and Senior Thomas Baker were nominated and chosen for the statewide award program.

Scott was nominated for his strong character and his generosity, said Kotzebue High School principal Mike Lane. He helps his father hunt caribou for village elders and is dedicated to the cultural activities that make up a strong traditional life.

Even at a young age, Scott advocates for a subsistence way of life through his actions.

"He's part of the youth leaders here at the (high school)," Lane said.

Scott said he didn't set out to become a role model or a leader, and he's not outspoken about his contributions. He simply lives his life according to what he needs, and what those around him need. If that means an elder needs help stocking food and supplies, then he's there to lend a hand.

"It always comes out naturally," Scott said.

The 15-year-old said his academics are a priority for him, but if the rhythm of life also takes him into the country for fishing, hunting and trapping he is happy in those surroundings too.

"I just like going with the day," he said.

Baker, 17, is the student body president and captain of the basketball team. He believes in the potential of individuals to make a difference in their own lives and in their community.

After his nomination, Baker was interviewed for a radio story through the Spirit of Youth awards program.

"My thought on being a leader is not being the person who's telling everyone else what to do," Baker told the interviewer. "It's being the person who can hear what everyone else is saying to them and make it work."

Baker is interested in pursuing writing, and hopes to travel to the lower 48 to study after high school.

Coming from a small place, he said, doesn't mean your work and dreams can't take you anywhere in the world you'd like to go, or change the world you know.

"That's the big thing, just making sure people know that we can make a difference," Baker said.

The Spirit of Youth program celebrates young Alaskans who work to make the state's communities a healthy, safe and happy place to live.

Hannah Heimbuch can be reached at hheimbuch@reportalaska.com.

Deering student wins spelling bee

If there is one thing Dorcas Swan can do better than any other student in the Northwest Arctic School District its S-P-E-L-L.

The Deering student proved her ability on Wednesday, Feb. 6, when she edged out a handful of area spellers to win the NWASD's district spelling bee during the annual "Battle of the Books" event.

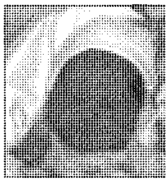
In all, Swan competed in the contest against six other contestants.

Swan, who had won the Deering spelling bee, managed to win the district's honors by spelling the word, "complexity."

In the District Spelling Bee, Swan faced off with other local site winners, including Amber's Vernae Ramoth, Buckland's Angelina Thomas, Kiana's Sarah Stewart, Noatak's Joel Onalik, Selawik's Trisha Mann and Shungnak's Sharla Cleveland.

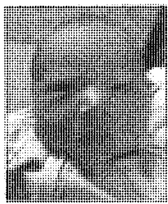
By winning the district bee, Swan will advance to the Alaska State Spelling Bee on March 1 in the Discovery Theatre at the Alaska Performing Arts Center in Anchorage.

This just in



Joseph Edward Jack Lyon

Ben Jack and Jolene Lyon of Anchorage are pleased to announce the birth of their beautiful son, Joseph Edward Jack, his Yup'ik name is Piluguk. Born on February 8th 2013 at 2:47 pm, weighing 7 lbs 7 ounces and 20 ½ inches long. He is welcomed into this world by his loving sister Maggie Marie (10), proud apa'urluq Joseph Lyon of Nome, proud maurluq and apa'urluq Anna and Paul Flynn of Stebbins.



Percy Scott Maasak Agnauraq Qilsiilaaq Wesley Jr

Percy Scott Maasak Agnauraq Qilsiilaaq Wesley Jr born February 7 at 10:30pm 8lbs 8oz 21in long. His parents are Percy sr & Eva Wesley, brother Isaiah, sister Hannah Leah and Barbara. Grandparents Tom McDonald Sr & Janet Mills, Barbara Wesley, Great Grandma Lucy Mills, auntie Rhonda Norton, Bunny McDonald and uncle Brock McDonald.

WHO DONE IT

Any charges reported in these statements are accusations, and the defendant is presumed innocent until or unless proven guilty.

State of Alaska Second Judicial District court, Barrow:

Courts

Nov. 21 — According to an amended judgment release, Peter R. Chandler, 32, was found guilty of attempting to sell alcohol without a license in a dry area. An importation charge was dismissed. Chandler was sentenced to 72 hours in jail and fined $1,500.

Jan. 26 — David E. Hopson, Jr., 29, was found guilty of driving with a suspended, revoked, or limited license and sentenced to 20 days in jail and two years on probation. His license was further revoked for 90 days, and was ordered to complete 80 hours of community service.

Jan. 29 — Merna M. Skin, 21, was found guilty of disorderly conduct, challenge to fight, and fined $250. She was ordered to complete 20 hours of community service and placed on one year probation.

Jan. 29 — William C. Stalker, Jr., 21, was found guilty of contributing to the delinquency of a minor and sentenced to three days in jail and one year probation.

Jan. 29 — Hugh Gareth Patkotak, Jr., 23, was found guilty of reckless driving and fined $1,000, ordered to complete 20 hours of community service, and placed on two years probation.

Cases Dismissed:

Jan. 29 — The court dismissed a fourth-degree assault charge against Eugene A. Gueco, 26, per a plea agreement in a December sentencing.

Jan. 29 — The court dismissed a public intoxication charge against Charlie Tukle, 21, due to an agreement from another case under Rule 11.

Jan. 29 — The court dismissed burglary, assault, theft and release violation charges against Eugene A. Gueco, 26, due to an agreement in prior case per Rule 11.

Jan. 29 — The court dismissed charges of misconduct involving a controlled substance, and contributing to the delinquency of a minor, against Freddie J. Oyagak 21, under a pretrial diversion agreement.

Jan. 29 — The court dismissed an assault charge against Ellen Oyagak, 19, under a pretrial diversion agreement.

Jan. 30 — The court dismissed a minor consuming alcohol charge against Esther F. Rexford, 20, under a pretrial diversion agreement.

WOOD POWER

From Page 6

trustees in the state. The project is its first endorsement.

Graber "is one of those people who's constantly interested in the world and how things work," Bittner said. "He has had an innate understanding of things, which allows him to create things using existing technology that are put together in a really unique way."

This story first appeared in the Alaska Dispatch and is reprinted here with permission.

Continued from page 13

North Slope Borough Clerk's Office
P.O. Box 69
Barrow, Alaska 99723
Phone: 907-852-0360
Fax: 907-852-0229

Borough Clerk, Jeannie Brower
Deputy Clerk, Elaine B. Solomon
Sr. Office Specialist, Tonya R. Fereti
Sr. Office Specialist, Michelle Leavitt

Notice of Regular Meeting and Public Hearing of the North Slope Borough Assembly

To: General Public:

You are hereby notified that the **Regular Meeting and Public Hearing** of the North Slope Borough Assembly is scheduled for **Tuesday, March 5, 2013 at 7:30 p.m.** in the Assembly Room at the NSB Administration Building in Barrow, Alaska.

Dated: February 21, 2013

Jeannie Brower

Jeannie Brower, CMC, Borough Clerk

Public Hearing:

To speak on Ordinances listed below, go to the NSB Teleconference center listed.

Anaktuvuk Pass, 1077 Summer Street	Point Hope, 914 Ippiq Street
Atqasuk, 417 Shugluk Street	Point Lay, 213 Qasigialik Street
Kaktovik, 4070 Hulahula Street	Prudhoe Bay, 1600 Drill Site 12 Road
Nuiqsut, 317 Pausanna Street	Wainwright, 576 Nashoalook Road

A. **Ordinance 93-19B**, an Ordinance Amending Rules of Procedure for the North Slope Borough Assembly for the Purpose of Amending the Time as to When Meeting(s) Should be Held

This non-code ordinance sets an earlier time for the regular monthly meeting to convene, to 7:00 p.m. from 7:30 p.m. It would also permit the Assembly to convene at an earlier time if meeting in the villages.

B. **Ordinance 2012-3H**, an Ordinance Appropriating Money Out of the Treasury for Fiscal Year Ending June 30, 2013.
Total Appropriated: $ 411,499,095.

Mayor's Office

BP Donation for Mayor's Education and Workforce Development Summit	10,000	
ASRC Donation for Kivgiq	50,000	
UIC Donation for Kivgiq	20,000	
BUECI Donation for Kivgiq	5,000	
City of Barrow Donation for Kivgiq	10,000	
Shell Oil Donation for Kivgiq	15,000	
NANA Donation for Kivgiq	2,500	
Kaktovik Inupiat Corporation Donation for Kivgiq	5,000	
Nunamiut Inupiat Corporation Donation for Kivgiq	250	
Tikiaq Corporation Donation for Kivgiq	2,000	
Kuukpik Corporation Donation for Kivgiq	7,500	
TransCanada Pipeline Donation for Kivgiq	5,000	
Northwest Arctic Borough Donation for Kivgiq	4,000	
Sam & Lee's Donation for Kivgiq	2,000	
Arctic Grocery Donation for Kivgiq	1,500	
ASRC Energy Services Donation for Kivgiq	10,000	149,750
Total Changes in Appropriations		$149,750

C. **Amended Ordinance 2012-10G**, an Ordinance Adopting a Long Range Capital Improvements Program and Financial Plan: Providing for the Acceptance of Certain Powers Transferred and Appropriating Funds to Accomplish the Capital Projects Outlined

Persons who wish to speak before the Assembly under the agenda heading "Appearance Request" on subjects other than those scheduled for public hearing must file appearance requests with the NSB Borough Clerk no later than 4:00 p.m. February 28, 2013, Thursday preceding the meeting which the requests are filed, specifying the topic on which they intend to speak. All others may be heard under "Village Concerns/Audience Participation"

2/21

Barrow Airport

Master Plan Update

AKSAS Project No. 61974

The State of Alaska Department of Transportation & Public Facilities (ADOT&PF) is updating the master plan for the Barrow Airport, a primary, commercial airport that serves as the main hub for the North Slope Borough, Barrow, and surrounding communities.

We want your input on this project. Looking into the future, how can the airport be improved to better serve your needs - whether it be travel, cargo or medical transport, or as a vehicle to bring economic opportunities to Barrow?

For more information contact:

Brooks & Associates
Anne Brooks, P.E., Public Involvement Specialist
1704 Bannister Road
Anchorage, AK 99508-4021
Toll free: 1-866-535-1877
E-mail: mycomments@brooks-alaska.com

It is the policy of the ADOT&PF that no person shall be excluded from participation in, or be denied benefits of any and all programs or activities we provide based on race, religion, color, gender, age, marital status, ability, or national origin, regardless of the funding source including Federal Transit Administration, Federal Aviation Administration, Federal Highway Administration and State of Alaska Funds.

The State of Alaska ADOT&PF complies with Title II of the Americans with Disabilities Act of 1990. Individuals with disabilities who may need auxiliary aids, services, and/or special modifications to participate in this public meeting should contact Anne Brooks at (907) 272-1877 no later February 21, 2012 to make arrangements. Individuals with a hearing impairment can contact ADOT&PF at our Telephone Device for the Deaf (TDD) at (907) 269-0473.

Public Open House

WHEN: ***Tuesday February 26, 2013***
4-8:00 pm
Presentations at 4:30 & 6:30 pm

WHERE: North Slope Borough
Assembly Chambers
1274 Agvik St., Barrow

Come to the ADOT&PF public open house. Visit the Web site (see link below) and send the team an email or complete our online survey by clicking on the link on the web site.

dot.alaska.gov/nreg/barrowmp

Brooks & Associates
1704 Bannister Road
Anchorage, AK 99508-4021

PRESORTED STD
U.S. POSTAGE
PAID
PERMIT NO. 537
ANCHORAGE, AK

Barrow Airport
Master Plan Update

Public Open House
Tuesday, February 26, 2013

Public Comments <mycomments@brooks-alaska.com> February 24, 2013 3:23 PM
To: Dallas-Lee Brower <dl@barrow.com>
Cc: Patrick Cotter <PatrickCotter@pdceng.com>, "Jeffery A (DOT) Roach" <jeff.roach@alaska.gov>
Re: Comments Barrow Airport

Dallas -- thank you for your detailed comments regarding the Barrow Airport Master Plan update. We will take them into consideration as we develop the plan. Check the web site for our progress and notice of future meetings.

M. Anne Brooks P.E.
Public Involvement Specialist
Brooks & Associates
E-mail: mycomments@brooks-alaska.com
Tel: 907-272-1877
Toll Free: 866-535-1877

On Feb 24, 2013, at 11:13 AM, Dallas-Lee Brower <dl@barrow.com> wrote:

Dear Ms. Brooks,

As I will be out of state when you have your Open House in Barrow, I wished to provide comments regarding the ADOT&PF regarding the master plan for the Barrow airport.

Firstly, I have noticed that most long range plans for buildings, hospitals, airport terminals etc. are too small by the time they are actually built and put into full operation. The demographics that are used, if even well thought through, often do not speak to the needs for the future; they are very limited. The official census US Census for the North Slope Borough (NSB) was grossly underreported. The use of those figures do not predict that factor well, also birth rates need to be considered. Since our lodging has not been able to meet the needs of travelers, you will have some difficulty determining the actual need. For example, I normally have many visitors in the Spring and Fall, but there were not rooms avaialble. Therefore, there was no official count as to persons who could not come to Barrow. Then add in projected oil and gas and other related upcoming operations, and the figures will be larger than you probably realize.

Entrance to and from planes from a second floor that would take away the need to go outside, except for those planes that absolutely require it, would be a high priority.

I would like to see the terminal as not only a place of entry and departure, but have a small mall like atmosphere, that is open during the day. I'd like to see varied restaurants/coffee cart; nail salon; Hudson Books or something similar to the Hudson chain; chair massage business; Arctic Slope Information corner; have a arctic crafts shop and so forth.

In addition, we need to have an actual carousel for baggage. One that is large or two large carousels that will accommodate the future. They should have the markers in the floor for where travelers are to stand until they actually take their baggage.

There needs to be two public telephones. Not everyone has a cell phone, or the cell phones are not working for any number of reasons. They can be either coin or credit card operated, but something needs to be available. This demonstrates good customer service.

Put up large clocks that work. Or have the series of clocks that show the time in different time zones. Our travelers do not only stay in the Alaska time zone. Clocks demonstrate good customer service.

Have one or two strategically placed arrival and departure monitors. Good customere service.

Have separate bathrooms including the sink area. Have at least 6 stalls for women and a sufficient number for men. The Dyson Hand Dryer at the Anchorage Airport works exceptionally well. Perhaps have enough of those will be workable, along with sensored toilets, and facets. Keep the paper use down, unless you want one sensored paper dispensor per bathroom. Good customer service.

Have a child care/baby changing station next to the ladies room but separate from it. Good customer service.

Have a US Mail Box. Good customer service.

Have separate drop off and pick up areas outside the terminal. Have overnight/long term paid parking garage next to and attached to the terminal. This would need more spaces than you may think, because organizations could pay for annual parking, there would be designated parking for terminal/airline employees, and there would need to be enough parking for trucks of varied sizes, SUV, and all other sized vehicles.

There needs to be a reasonable amount of seating in the terminal, as well as after having gone through TSA control.

Accessibility throughout the terminal for the disabled. Often architects only look at minimum code and not complete functionality. Good customer service.

If there is a separate waiting area after the TSA check point, have televisions stategically located on the walls (that work). Good customer service.

Smoking areas need to be placed away from the terminal. Currently they are at the entrance doors and the smoke can come into the terminal or is disruptive, especially to those with allergies. Also, when the smoking area is 50 feet from the building, insurance rates have a great decline.

Ensure that the cargo area a sufficiently large enough to handle the amount of cargo and the vehicle traffic for it. The entrance for trucks etc. for cargo needs to be separate from domestic drop off and arrival. Good customer service.

Have taxi stand area for at least 3-5 taxis at a time for pick up and drop off. Good customer service.

Need to have good sized overhang on outside of building to protect people arriving or waiting for pick ups. Good cusotmer service.

Have designated area for medical transports to arrive (other than NSB Search and Rescue). More people are paying for ApolloMT (medical transport) insurance and they and any other medical travel flights need to be able to be serviced in an efficient manner. Good customer services.

There should be all the varied medical necessities required at a terminal available easily.

Terminal security will need to be address and the NSBPD might consider having a one/two person office there.

Ms. Brooks, I'm sure I could think of more items, but at least this gives you a good overview of my thinking.

Thank you for your consideration.

Dallas-Lee Brower

Barrow Airport Master Plan Update

Project No. 61974

MEETING NOTES

SUBJECT:	Barrow Airport Master Plan Update
PROJECT NO.:	ADOT&PF: 61974; B&A Project No. 3925.09
GROUP:	Public
DATE:	Tuesday, February 26, 2013
TIME:	4 pm to 8 pm, presentation at 4:30
LOCATION:	North Slope Borough Assembly Chambers
MEETING OUTREACH:	See Table 1. Meeting Outreach
MEETING ATTENDANCE:	41 people signed in
MEETING MATERIALS:	Aerial photo, comment sheets, PowerPoint presentation, Barrow Roads Project Update (provided by North Slope Borough)
STAFF PRESENT:	*ADOT&PF*: Jeff Roach, Project Manager; Alexa Greene, Hannah Blankenship, Roger Maggard, Lauren Ivanov, Brittany Russell, Paul Karczmarczyk, Jeff Russell, John Olsen *FAA:* Pat Oien *PDC Engineers*: Patrick Cotter, Project Manager; Valerie Webb Environmental Analyst *Brooks & Associates:* Anne Brooks, P.E., Public Involvement Lead; Camden Yehle, Public Involvement

MEETING INFORMATION:

Attendees were greeted at the door and ask to sign-in and briefed on the open house format, location of materials, and availability of project staff to answer their questions. They were also reminded that presentations would be provided at 4:30 p.m. and 6:30 p.m. Staff members were on hand to answer questions. Pizza and beverages were provided. An overview of the project was given in the format of a PowerPoint presentation beginning at 4:30 p.m. Edith Nageak interpreted the presentation, discussion and question and answer session into Inupiat. The presentation and discussion was taped using the North Slope Borough equipment.

Three surveys (Barrow Resident, Barrow Business and Barrow Airport Flight Service) were available for attendees.

No written comments were received at the meeting.

The project team recorded the following comments, questions and team responses at the meeting:

- Access to Barrow is blocked by the airport when returning on snow machines from the south. Melt water on the sea ice forces whalers on land and they traverse around the west end of the runway.

- Residents are concerned about the airport noise and its close proximity to residences. They feel boxed in by the airport and unable to expand or develop the community.
- Alaska Airlines parking is very poor and causes safety problems.
- Residents mentioned relocation of the airport and asked if it was being considered. Locals felt the airport boxed them in and created a barrier to growth and development. The team indicated that it could be looked at again and weighed with the same criteria as other items – cost, socio-economic, environmental impacts, etc.
- How will you evaluate the impacts of industry on the airport, particularly the heavy industry impacts of oil and gas development? The team indicated they would be discussing the airport needs with users to determine if any changes would be necessary to respond to industry activities in the area. Much of this information is expected to come from the surveys.
- What are the foreseeable events affecting the airport? Locals mentioned an acceleration of coastal erosion that could impact the airport.
- What would happen to airport land in the event a new airport was created? The airport land would remain airport property.

Email comments received prior to the meeting are summarized below:

- Two comments were received outlining concerns about the Alaska Airlines terminal facilities. The comments discussed the area available for TSA screening, lack of baggage carousel, arrival/departure monitors, etc. Commenters felt this was needed for good customer service.
- One email requested information on the team's efforts to comply with Title VI of the Civil Rights Act allowing project access to all.

Table 1. Meeting Outreach

Date	Outreach method	Description
2/12/2013	Project website	Project specific website hosted by ADOT&PF & formatted in accordance with Department specifications.
2/12/2013	Postcard mailer	Inviting the public to the 2/26/13 open house
2/14/2013	Display advertising in *Anchorage Daily News*	Inviting the public to the 2/26/13 open house
2/14/2013 2/21/2013	Display advertising in *Arctic Sounder*	Inviting the public to the 2/26/13 open house
2/14/2013	Display advertising in *Fairbanks Daily News Miner*	Inviting the public to the 2/26/13 open house
2/12/2013	State of Alaska Online Notice	Inviting the public to the 2/26/13 open house
2/16/2013 to 2/25/2013	Public service announcement request sent to KBRW-FM	Sent with request to broadcast announcement inviting pubic to meeting.

Date	Outreach method	Description
	and KBRW-AM	
2/18/2013	Constant Contact email	Provide email invitation to the meeting to project stakeholders
2/16/2013 to 2/25/2013	Public service announcement request sent to GCI	Sent with request to broadcast announcement inviting pubic to meeting.

Related documents on file.
**Denotes items posted on the web site.

Sign in Sheets
Handouts (Comment Sheet, Surveys**)
Flier Mailer
Public Service Announcements
Display Advertising
PowerPoint presentation**

Barrow Airport Master Plan Update

AKSAS Project No. 61974

Comment Sheet

Please use this form to provide written comments about the Barrow Airport Master Plan Update. Thanks for your input!

Name	
Street Address or PO Box	
City, State, Zip	
Email	Phone

Your comments:

Access to town is blocked by the airport when returning on snowmachines from the south. Melt water on the sea ice ~~to~~ forces whalers on land & around the west end of the runway.

verbal comment from attendee

(written by Patrick Cotter)

If you need more space, continue your comment on the back of the page.

Please send written comments via:

Mail
Brooks & Associates
Attn: Barrow Airport Master Plan Update
1704 Bannister Rd
Anchorage, AK 99508

Call
Alaska Relay
TTY 800-770-8973 or
Toll Free: 1-866-535-1877

Email
mycomments@brooks-alaska.com

Project web site: dot.alaska.gov/nreg/barrowmp

Constant Contact <support@constantcontact.com>
To: a.brooks@brooks-alaska.com
Reply-To: support@constantcontact.com
Your email Barrow Airport Master Plan Public Meeting has been sent

March 12, 2013 4:20 PM

Email Confirmation

Constant Contact
Connect. Inform. Grow.

Dear Anne Brooks,

Your email, named Thank you for Attending the Barrow Airport Master Plan Update Open House!, was sent on 03/12/2013 around 8:20 PM EDT.

Below is a copy of the HTML version your contacts received. Don't forget, you can easily monitor the effectiveness of your email with real-time metrics and stats. Log in to your Constant Contact account and visit the **Reports** area under the Emails tab.

Subject: Barrow Airport Master Plan Public Meeting

Alaska Department of Transportation & Public Facilities

Barrow Airport Master Plan Update

AKSAS Project No. 61974

On behalf of the Alaska Department of Transportation and Public Facilities (ADOT&PF) and the PDC Engineers Inc. project team, thank you to all who attended the Barrow Airport Master Plan Update Open House on February 26th. We value your input, questions and comments and hope that you choose to continue to be involved with the project.

Please take our brief survey to help us understand how you use and value the Barrow Airport and what you believe will improve it.

Resident Survey -- take this survey if you live and work in Barrow.

Business Owner Survey -- take this survey if you have a business in Barrow.

Air Flight Service Survey -- take this survey if you operate aircraft into and out of the Barrow Airport.

Track the project and review the project materials, including the presentation, on the project website.

We look forward to continuing to work with you!

For additional information contact:

Anne Brooks, Public/Stakeholder Involvement
Toll free telephone: 1-866-535-1877

Email: mycomments@brooks-alaska.com

Jeff Roach, ADOT&PF Project Manager
Telephone: 1-907-451-2381
Email: jeff.roach@alaska.gov

It is the policy of the Alaska Department of Transportation & Public Facilities (ADOT&PF) that no person shall be excluded from participation in, or be denied benefits of any and all programs or activities we provide based on race, religion, color, gender, age, marital status, ability, or national origin, regardless of the funding source including Federal Transit Administration, Federal Aviation Administration, Federal Highway Administration and State of Alaska Funds.

The ADOT&PF complies with Title II of the Americans with Disabilities Act of 1990. Individuals with disabilities who may need auxiliary aids, services, and/or special modifications to participate in this public process should contact Anne Brooks at (907) 272-1877 to make arrangements. Individuals with a hearing impairment can contact ADOT&PF at our Telephone Device for the Deaf (TDD) at (907) 269-0473.

Barrow Airport Master Plan Update

AKSAS Project No. 61974

Comment Sheet

Please use this form to provide written comments about the Barrow Airport Master Plan Update. Thanks for your input!

Name Emma S. Kignak	
Street Address or PO Box 1564	
City, State, Zip Barrow Alaska 99723	
Email emma.kignak@north-slope.org	Phone 852-0276

Your comments:

Alaska Airport is standing room only. Sometimes we are ask to wait or make room for everyone - Very crowded We difinately need a bigger airport - Maybe make upstairs for passengers - / Baggage claim downstairs ("just a suggestion")

If you need more space, continue your comment on the back of the page.

Please send written comments via:

Mail	Call
Brooks & Associates Attn: Barrow Airport Master Plan Update 1704 Bannister Rd Anchorage, AK 99508	Alaska Relay TTY 800-770-8973 or Toll Free: 1-866-535-1877

Email

mycomments@brooks-alaska.com

Project web site: dot.alaska.gov/nreg/barrowmp

20130409 cs Kignak

Design Survey | Collect Responses | Analyze Results

View Summary
Browse Responses
Filter Responses
Crosstab Responses
Download Responses
Share Responses

Default Report

Displaying 1 of 1 respondents

Response Type:
Normal Response

Custom Value:
empty

Response Started:
Wednesday, March 13, 2013 9:45:16 AM

Collector:
BarrowAMP_FlightServiceSurvey
(Web Link)

IP Address:
209.112.135.198

Response Modified:
Wednesday, March 13, 2013 10:23:35 AM

1. Please provide the following contact information. Your name and telephone number are required.

Pilot's Name: (answer required) - Darren Young

Company: - Warbelow's/Air Arctic

Address: - P.O. Box 82991

City/Town: - Fairbanks

State: - AK

ZIP/Postal Code: - 99709

Email Address: - adventure@northernalaska.com

Phone Number: (answer required) - 907-474-3550

1. How many operations, by aircraft type, do you or your company perform at Barrow Airport? For paper survey, make additional copies to add more aircraft. For online survey, follow on screen directions.

Aircraft make and model - Piper Navajo Chieftain PA 31-350

Runway length required - 3000

Weekly operations, summer - 6

Weekly operations, winter - 0

2. Do you have additional aircraft to add?

No

1. Do you expect your operations to change? If so, please indicate in what way. For example, increase, decrease, more cargo, more passengers, etc.

Seasonal dependent, most likely would increase up to 7 flight per week

2. What are your reasons for flying to Barrow Airport?

Tour and charter services to Barrow from Fairbanks and Deadhorse

1. Please explain the characteristics of your scheduled passenger service.

a. Annual number of scheduled passengers - 0

b. Average number of scheduled passengers per day for your peak month - 0

c. Number of scheduled passengers in peak hour - 0

d. Time of day for peak passenger enplanements - 0

e. Time of day for peak passenger deplanements - 0

2. List your peak month by year.

No Response

3. What was the average number of scheduled passengers during your peak month listed in the previous question?

2010 - 0

2011 - 0

2012 - 0

1. Please explain the characteristics of your unscheduled passenger service.

a. Annual number of unscheduled passengers - 784

b. Average number of unscheduled passengers per day for your peak month - 7

c. Number of unscheduled passengers in peak hour - 7

d. Time of day for peak unscheduled passenger enplanements - 1200

e. Time of day for peak unscheduled passenger deplanements - 1500

2. List your peak month of unscheduled passengers by year.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Peak month in 2010							X					
Peak month in 2011							X					
Peak month in 2012							X					
Comments:												

3. What was the average number of unscheduled passengers during your peak month listed in the previous question?

2010 - 120

2011 - 140

2012 - 196

1. If you fly US Postal Service (USPS) mail to Barrow, please answer the questions below.

No Response

2. What percentage of mail is sent via bypass? (Please enter percentage, actual or approximate if not known)

No Response

3. If you fly cargo to Barrow Airport, please answer the questions below.

No Response

4. List your peak month of cargo by year.

No Response

5. Peak cargo characteristics

No Response

6. What type and quantity of fuel to you ship monthly?

No Response

7. Describe your other trips to and from Barrow Airport.

No Response

8. What Instrument Flight Rule (IFR) capabilities do your aircraft/pilots have, if any?

ILS, GPS LP/LPV

9. What percentage of Instrument Landing System (ILS) operations and non-precision instrument (NPI) operations do you estimate per month?

Instrument Land System (ILS) - 8

Non-Precision Instrument (NPI) - 4

10. What is the highest month of ILS operations and NPI operations?

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ILS						X						
NPI								X				

Comments:

11. Do you feel your operations are hindered by limitations of the airport (approach lights, parking, maintenance, air traffic control, procedures)? If so, why?

Yes

Transient Parking is very limted. Fueling (100LL) is an extreme issue and very dificult to get services to the point we have considered dropping Barrow as a destination for our Navajos

12. What aircraft would you, or your company, fly to Barrow Airport if you were not limited by airport facilities? Please list aircraft.

No Response

1. Do you experience delays in landing or takeoff?

No

2. Is the runway length adequate?

Yes

3. Why should the runway be longer? Check all that apply.

No Response

4. Which end of the runway is your normal approach?

North

5. What factor is your approach most dependent upon? Please check all that apply.

ILS and lower minimums capability

6. What seasonal problems do you encounter at the Barrow airport? For example, soft surface, snow drifting, water ponding, icing, frost heaves, etc.

Summer is our only operating season. Typically no issues other than wildlife

7. Do you see a need for a crosswind runway at Barrow Airport?

No

Never had any issues with crosswinds being out of limits

8. Do you see a need for a parallel runway at Barrow Airport?

No

The runway length and condition is in good shape. I would rather see money go to infastructure such as parking for transient aircraft and FBO type services for guest/tourist visiting such as public rest rooms at the airport ramp

1. Is the apron adequate?

No

not enough transient parking

2. Do you park any aircraft at Barrow Airport?

Yes

3. If yes, please provide aircraft type and the number of days per year by season you park an aircraft at Barrow Airport.

Summer Parking (aircraft type, days/year) - PA-31-350 Navajo Chieftains 64 days/year

4. If you park an aircraft at Barrow Airport, is it parked in a hangar?

No

no hagar available

5. If yes, please provide type of parking position (check all that apply).

No Response

6. Are the aircraft parking and tie down adequate at Barrow Airport?

No

where are the tie downs?

7. Are the airport access roads adequate at Barrow Airport?

Yes

8. Are the fueling facilities and utilities adequate at Barrow Airport?

No

Barrow has the absolute worst service for re-fueling--to the point we have considered pulling operations from Barrow

9. Are the navigational aids (NAVAIDS) adequate at Barrow Airport?

Yes

10. Do you or your company currently lease a lot at Barrow Airport?

No

11. Would you or your company consider leasing a lot to support your operations?

Yes

12. Are the support facilities adequate?

No

13. What are your long term(11-20 years) facilities requirements in square footage (SF)?

No Response

14. What are your short term (0-10 years) facilities requirements in square footage (SF)?

No Response

15. What are your short term (within 5 years) facilities requirements for hangars and maintenance areas in square footage (SF)?

No Response

16. What are your long-term (20 years) facilities requirements for hangars and maintenance areas in square footage (SF)?

No Response

17. How much landside area (in square feet) does your company need in the short term?

No Response

18. How much landside area (in square feet) does your company need in the long term?

No Response

19. Please describe your passenger/baggage processing.

Due to the lack of passenger handling for non-scheuduled service we utilize the local hotel for all of our passenger handling needs

20. Is security screening required for passenger/baggage processing?

No

21. Do you have a baggage claim device?

No

1. What improvements would you like to see at Barrow Airport? Rank in order from most important (1) to least important (5).

	1	2	3	4	5
Runway condition	X				
Pavement condition		X			
Snow removal			X		
Snow removal storage				X	
Vandalism and local security					X

Comments:

2. What improvements would you like to see at Barrow Airport? Rank in order from most important (1) to least important (7).

	1	2	3	4	5	6	7
Lease lot demand			X				
Safety areas expansion				X			
Passenger terminal facilities		X					
Cargo facilities					X		
General aviation/ski airstrip at Barrow						X	
Aircraft fueling facilities	X						

Vandalism and local security					X
Comments:					

3. What improvements would you like to see at Barrow Airport? Rank in order from most important (1) to least important (5).

	1	2	3	4	5
National security requirements					X
Itinerant aircraft parking	X				
Passenger terminal facilities		X			
Automobile parking at terminal			X		
Automobile parking in other areas				X	
Comments:					

Design Survey | Collect Responses | Analyze Results

View Summary
Browse Responses
Filter Responses
Crosstab Responses
Download Responses
Share Responses

Barrow residential

Displaying 4 of 5 respondents

Response Type: Normal Response

Collector: New Link (Web Link)

Custom Value: *empty*

IP Address: 206.81.93.13

Response Started: Wednesday, August 14, 2013 4:35:04 PM

Response Modified: Wednesday, August 14, 2013 4:39:45 PM

1. We want to keep you informed about the project. Providing your contact information will allow us to contact you for input throughout the Barrow Airport Master Plan Update. Your name and telephone number are required.

Name (required) - Alys Orsborn
Company: - Arctic Slope Telephone Coop
Address: - Po Box 553
City/Town: - Barrow
State: - AK
ZIP/Postal Code: - 99723
Email Address: - alys@astac.net
Phone Number (required) - 907-852-2444

2. Do you want your name and company affiliation to remain confidential?

No

1. What improvements are needed at the Barrow Airport and why?

Parking is a problem when picking up or delivering freight and luggage. Both ERA and AK Air lack parking when the area in front of their buildings is full

2. Please select the services provided to you by the Barrow Airport. (Check all that apply)

Business travel
Vacation travel
School travel
Package/cargo pickup

3. What concerns do you have with airport development and why?

No

4. On a scale of 1 to 5 (1 is most important and 5 is least important) please rank the following issues.

	1	2	3	4	5
Runway condition	X				
Snow removal		X			
Snow removal storage					X
Airport vandalism and local security			X		
Pavement maintenance				X	

Comments:

5. On a scale of 1 to 6 (1 is most important and 6 is least important) please rank the following issues.

No Response

6. On a scale of 1 to 6 (1 is most important and 6 is least important) please rank the following issues.

	1	2	3	4	5	6
Automobile parking at terminal	X					
Automobile parking in other areas		X				
Separation of large and small aircraft			X			
Short term or Itinerant aircraft parking				X		
Lease lot availability					X	
Lease lot demand						X

Comments:

7. On a scale of 1 to 3 (1 is most important and 3 is least important) please rank the following issues.

	1	2	3
Separation of large and small aircraft	X		
Non-aviation airport issues		X	
National security requirements			X

Comments:

8. Please list other issues the Barrow Airport Master Plan Update should address.

No Response

Design Survey | Collect Responses | Analyze Results

View Summary
Browse Responses
Filter Responses
Crosstab Responses
Download Responses
Share Responses

Barrow residential

Displaying 1 of 5 respondents

Response Type:
Normal Response

Collector:
New Link
(Web Link)

Custom Value:
empty

IP Address:
24.237.124.181

Response Started:
Thursday, March 14, 2013 10:47:36 PM

Response Modified:
Thursday, March 14, 2013 11:04:05 PM

1. We want to keep you informed about the project. Providing your contact information will allow us to contact you for input throughout the Barrow Airport Master Plan Update. Your name and telephone number are required.

Name (required) - George Olemaun
Company: - Inupiat Community of the Arctic Slope
Address: - Po Box 934
City/Town: - Barrow
State: - AK
ZIP/Postal Code: - 99723
Email Address: - golemaun@hotmail.com
Phone Number (required) - 907-852-4227

2. Do you want your name and company affiliation to remain confidential?

No

1. What improvements are needed at the Barrow Airport and why?

better access to the terminal without traffic congestion,more parking area. either move the airport or have an alternate airport if Barrow Airport is unuseable , alternate should be Alqasuk, alaska

2. Please select the services provided to you by the Barrow Airport. (Check all that apply)

Business travel
Vacation travel
School travel
Mail pick up
Package/cargo pickup

3. What concerns do you have with airport development and why?

Yes

If there are any more expansions to the airport it will eliminate our access to the new gravesite and limit our subsisitsence route around the airport

4. On a scale of 1 to 5 (1 is most important and 5 is least important) please rank the following issues.

	1	2	3	4	5
Runway condition		X			
Snow removal	X				
Snow removal storage				X	
Airport vandalism and local security			X		
Pavement maintenance					X

Comments:

5. On a scale of 1 to 6 (1 is most important and 6 is least important) please rank the following issues.

	1	2	3	4	5	6
General aviation/ski airstrip at Barrow Airport			X			
Safety areas expansion				X		
Apron expansion	X					
Passenger terminal facilities		X				
Cargo facilities					X	
Aircraft fueling facilities						X

Comments:

6. On a scale of 1 to 6 (1 is most important and 6 is least important) please rank the following issues.

	1	2	3	4	5	6
Automobile parking at terminal	X					
Automobile parking in other areas		X				
Separation of large and small aircraft			X			
Short term or Itinerant aircraft parking				X		
Lease lot availability					X	
Lease lot demand						X

Comments:

7. On a scale of 1 to 3 (1 is most important and 3 is least important) please rank the following issues.

No Response

8. Please list other issues the Barrow Airport Master Plan Update should address.

he list provided with the scale was already rated my numbers were changed automatically. Move the airport as was previously planned with the last master Plan.

Design Survey | Collect Responses | Analyze Results

View Summary
Browse Responses
Filter Responses
Crosstab Responses
Download Responses
Share Responses

Barrow residential

Displaying 5 of 5 respondents

Response Type: Normal Response
Collector: New Link (Web Link)
Custom Value: *empty*
IP Address: 198.99.24.125
Response Started: Thursday, December 5, 2013 9:19:36 AM
Response Modified: Thursday, December 5, 2013 10:21:09 AM

1. We want to keep you informed about the project. Providing your contact information will allow us to contact you for input throughout the Barrow Airport Master Plan Update. Your name and telephone number are required.

Name (required) - Tom Nicolos
Company: - North Slope Borough
Address: - PO Box 350
City/Town: - Barrow
State: - AK
ZIP/Postal Code: - 99723-0350
Email Address: - tom.nicolos@north-slope.org
Phone Number (required) - 907.852.0371

2. Do you want your name and company affiliation to remain confidential?

No

1. What improvements are needed at the Barrow Airport and why?

Increased areas for commercial development to support the economic development of future off shore oil exploration and development.

2. Please select the services provided to you by the Barrow Airport. (Check all that apply)

Business travel
Vacation travel
Package/cargo pickup

3. What concerns do you have with airport development and why?

Yes

In the December 4th Barrow Airport Master Plan meeting held in Barrow the preferred alternative shows commercial development directly adjacent to a residential subdivision. Additionally, it has relocated the transit parking to the area close to the Flight Service Station which is also directly adjacent to a residential subdivision. Currently I am a member of the Barrow Zoning Commission and regularly receive public complaints regarding noise form the airport. While the transit parking is small or nonexistent at this point, as oil industry development grows over the next five to ten years the likelihood of 24-hour traffic is extremely likely.

4. On a scale of 1 to 5 (1 is most important and 5 is least important) please rank the following issues.

	1	2	3	4	5
Runway condition	X				
Snow removal			X		
Snow removal storage					X
Airport vandalism and local security				X	
Pavement maintenance		X			

Comments:

5. On a scale of 1 to 6 (1 is most important and 6 is least important) please rank the following issues.

No Response

6. On a scale of 1 to 6 (1 is most important and 6 is least important) please rank the following issues.

	1	2	3	4	5	6
Automobile parking at terminal		X				
Automobile parking in other areas						X
Separation of large and small aircraft				X		
Short term or Itinerant aircraft parking			X			
Lease lot availability	X					
Lease lot demand					X	

Comments:

7. On a scale of 1 to 3 (1 is most important and 3 is least important) please rank the following issues.

	1	2	3
Separation of large and small aircraft		X	
Non-aviation airport issues	X		
National security requirements			X

Comments:

8. Please list other issues the Barrow Airport Master Plan Update should address.

Projected noise pollution from commercial development next to residential subdivisions.

Design Survey | Collect Responses | Analyze Results

View Summary
Browse Responses
Filter Responses
Crosstab Responses
Download Responses
Share Responses

Barrow residential

Displaying 3 of 5 respondents

Response Type:
Normal Response

Collector:
New Link
(Web Link)

Custom Value:
empty

IP Address:
198.99.24.125

Response Started:
Tuesday, May 21, 2013 1:59:09 PM

Response Modified:
Tuesday, May 21, 2013 2:03:04 PM

1. We want to keep you informed about the project. Providing your contact information will allow us to contact you for input throughout the Barrow Airport Master Plan Update. Your name and telephone number are required.

Name (required) - Kaitlin Applegate

Address: - PO Box 307

City/Town: - Barrow

State: - AK

ZIP/Postal Code: - 99723

Email Address: - kaitlin.applegate@north-slope.org

Phone Number (required) - 907-852-0467

2. Do you want your name and company affiliation to remain confidential?

Yes

1. What improvements are needed at the Barrow Airport and why?

No Response

2. Please select the services provided to you by the Barrow Airport. (Check all that apply)

No Response

3. What concerns do you have with airport development and why?

No Response

4. On a scale of 1 to 5 (1 is most important and 5 is least important) please rank the following issues.

No Response

5. On a scale of 1 to 6 (1 is most important and 6 is least important) please rank the following issues.

No Response

6. On a scale of 1 to 6 (1 is most important and 6 is least important) please rank the following issues.

No Response

7. On a scale of 1 to 3 (1 is most important and 3 is least important) please rank the following issues.

No Response

8. Please list other issues the Barrow Airport Master Plan Update should address.

No Response

Design Survey | Collect Responses | Analyze Results

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Browse Responses
Filter Responses
Crosstab Responses
Download Responses
Share Responses

Barrow residential

Displaying 2 of 5 respondents

Response Type:
Normal Response

Collector:
New Link
(Web Link)

Custom Value:
empty

IP Address:
159.49.254.2

Response Started:
Sunday, April 28, 2013 5:35:14 PM

Response Modified:
Sunday, April 28, 2013 5:42:53 PM

1. We want to keep you informed about the project. Providing your contact information will allow us to contact you for input throughout the Barrow Airport Master Plan Update. Your name and telephone number are required.

Name (required) - Alan Kerner
Address: - P.O. Box 1966
City/Town: - Barrow
State: - AK
ZIP/Postal Code: - 99723
Email Address: - alankerner@gmail.com
Phone Number (required) - 907 852 6079

2. Do you want your name and company affiliation to remain confidential?

Yes

1. What improvements are needed at the Barrow Airport and why?

More space to build a bigger terminal. The terminal is way too small for the amount of people who fly in and out.

2. Please select the services provided to you by the Barrow Airport. (Check all that apply)

Business travel
Vacation travel
Package/cargo pickup

3. What concerns do you have with airport development and why?

No

4. On a scale of 1 to 5 (1 is most important and 5 is least important) please rank the following issues.

	1	2	3	4	5
Runway condition	X				
Snow removal		X			
Snow removal storage				X	
Airport vandalism and local security					X
Pavement maintenance			X		

Comments:

5. On a scale of 1 to 6 (1 is most important and 6 is least important) please rank the following issues.

	1	2	3	4	5	6
General aviation/ski airstrip at Barrow Airport						X
Safety areas expansion			X			
Apron expansion				X		
Passenger terminal facilities	X					
Cargo facilities		X				
Aircraft fueling facilities					X	
Comments:						

6. On a scale of 1 to 6 (1 is most important and 6 is least important) please rank the following issues.

	1	2	3	4	5	6
Automobile parking at terminal	X					
Automobile parking in other areas		X				
Separation of large and small aircraft				X		
Short term or Itinerant aircraft parking					X	
Lease lot availability			X			
Lease lot demand						X
Comments:						

7. On a scale of 1 to 3 (1 is most important and 3 is least important) please rank the following issues.

	1	2	3
Separation of large and small aircraft		X	
Non-aviation airport issues	X		
National security requirements			X
Comments:			

8. Please list other issues the Barrow Airport Master Plan Update should address.

No Response

THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Transportation and Public Facilities

NORTHERN REGION
PLANNING

2301 PEGER ROAD
FAIRBANKS, ALASKA 99709-5316
Main: 907-451-5151
TDD: 907-451-2363
FAX: 907-451-2313

August 1, 2013

Alaska Airlines
Attn.: Laurie Curtis
P.O. Box 68900
Seattle, WA 98168-0900

Dear Ms. Curtis:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to a briefing on the Barrow Airport Master Plan update. The master plan update provides an opportunity to review all features of the airport and its operation and plan for its future. In addition, the master plan update is an important requirement enabling the ADOT&PF to receive Federal Aviation Administration funding to support current and future projects at the Barrow airport.

The project team has completed the following portions of the update:

- Inventory of Existing Conditions and Issues
- Land use Assessment
- Environmental Overview
- Summary of Existing and Potential issues
- Draft Aviation Demand Forecast

In mid-August the team will be in Barrow to conduct another public meeting. We would like to brief <u>local government officials at 3:00 p.m. on August 19, 2013 in the North Slope Borough Assembly Chambers</u>. At this time, you will be able to view our work, ask questions and help the team shape the master plan.

We also invite you to attend the public meeting at on August 19, 2013 from 6 to 8 p.m., in the NSB Assembly Chambers. The team will make a presentation beginning at 6:15 p.m.

We look forward to working with you.

Sincerely,

Jeffery A. Roach

Jeffery A. Roach
Project Manager

"Get Alaska Moving through service and infrastructure."

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Department of Transportation and Public Facilities

NORTHERN REGION
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FAX: 907-451-2313

August 1, 2013

Inupiat Community of the Arctic Slope
Attention President George Olemaun
PO Box 278
Barrow, AK 99723

Dear President Olemaun:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to a briefing on the Barrow Airport Master Plan update. The master plan update provides an opportunity to review all features of the airport and its operation and plan for its future. In addition, the master plan update is an important requirement enabling the ADOT&PF to receive Federal Aviation Administration funding to support current and future projects at the Barrow airport.

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Project Manager

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TDD: 907-451-2363
FAX: 907-451-2313

August 1, 2013

Arctic Slope Native Association, Ltd.
P.O. Box 1232
Barrow, AK 99723

Dear Executive Director:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to a briefing on the Barrow Airport Master Plan update. The master plan update provides an opportunity to review all features of the airport and its operation and plan for its future. In addition, the master plan update is an important requirement enabling the ADOT&PF to receive Federal Aviation Administration funding to support current and future projects at the Barrow airport.

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Project Manager

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FAX: 907-451-2313

August 1, 2013

Thomas Olemaun
Native Village of Barrow Inupiat Traditional Government, President
P.O. Box 1130
Barrow, AK 99723

Dear Mr. Olemaun:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to a briefing on the Barrow Airport Master Plan update. The master plan update provides an opportunity to review all features of the airport and its operation and plan for its future. In addition, the master plan update is an important requirement enabling the ADOT&PF to receive Federal Aviation Administration funding to support current and future projects at the Barrow airport.

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Sincerely,

Jeffery A. Roach

Jeffery A. Roach
Project Manager

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NORTHERN REGION
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TDD: 907-451-2363
FAX: 907-451-2313

August 1, 2013

Ben Frantz
Barrow Utilities & Electric Cooperative, Inc.
P.O. Box 449
Barrow, AK 99723

Dear Mr. Frantz:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to a briefing on the Barrow Airport Master Plan update. The master plan update provides an opportunity to review all features of the airport and its operation and plan for its future. In addition, the master plan update is an important requirement enabling the ADOT&PF to receive Federal Aviation Administration funding to support current and future projects at the Barrow airport.

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Sincerely,

Jeffery A. Roach

Jeffery A. Roach
Project Manager

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TDD: 907-451-2363
FAX: 907-451-2313

August 1, 2013

Clearwater Air, Inc.
Attn: General Manager
P.O. Box 7079
Nikiski, AK 99635

Dear General Manager:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to a briefing on the Barrow Airport Master Plan update. The master plan update provides an opportunity to review all features of the airport and its operation and plan for its future. In addition, the master plan update is an important requirement enabling the ADOT&PF to receive Federal Aviation Administration funding to support current and future projects at the Barrow airport.

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Jeffery A. Roach
Project Manager

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TDD: 907-451-2363
FAX: 907-451-2313

August 1, 2013

Jane Nelson
City of Barrow, City Clerk
P.O. Box 629
Barrow, AK 99723

Dear Ms. Nelson:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to a briefing on the Barrow Airport Master Plan update. The master plan update provides an opportunity to review all features of the airport and its operation and plan for its future. In addition, the master plan update is an important requirement enabling the ADOT&PF to receive Federal Aviation Administration funding to support current and future projects at the Barrow airport.

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We look forward to working with you.

Sincerely,

Jeffery A. Roach

Jeffery A. Roach
Project Manager

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FAX: 907-451-2313

August 1, 2013

Jeremy Goodwin
Public Works
City of Barrow
P.O. Box 629
Barrow, AK 99723

Dear Mr. Goodwin:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to a briefing on the Barrow Airport Master Plan update. The master plan update provides an opportunity to review all features of the airport and its operation and plan for its future. In addition, the master plan update is an important requirement enabling the ADOT&PF to receive Federal Aviation Administration funding to support current and future projects at the Barrow airport.

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Sincerely,

Jeffery A. Roach

Jeffery A. Roach
Project Manager

"Get Alaska Moving through service and infrastructure."

THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Transportation and Public Facilities

NORTHERN REGION
PLANNING

2301 PEGER ROAD
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Main: 907-451-5151
TDD: 907-451-2363
FAX: 907-451-2313

August 1, 2013

Leon Boyea
Police Chief
City of Barrow
P.O. Box 629
Barrow, AK 99723

Mr. Boyea:

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August 1, 2013

Bob Harcharek
City of Barrow, Mayor
P.O. Box 629
Barrow, AK 99723

Honorable Mayor Harcharek:

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August 1, 2013

Ralph Achenbach
Arctic Slope Telephone Association Cooperative, Inc.
4300 B St Ste 501
Anchorage, AK 99503

Dear Mr. Achenbach:

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August 1, 2013

Thomas Brower III
City of Barrow
P.O. Box 629
Barrow, AK 99723

Dear Mr. Brower:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to a briefing on the Barrow Airport Master Plan update. The master plan update provides an opportunity to review all features of the airport and its operation and plan for its future. In addition, the master plan update is an important requirement enabling the ADOT&PF to receive Federal Aviation Administration funding to support current and future projects at the Barrow airport.

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August 1, 2013

Anthony Edwardsen, President
Ukpeaġvik Iñupiat Corporation
3201 C Street, Suite 801
Anchorage, AK 99503-3934

Dear Mr. Edwardsen:

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August 1, 2013

Era Alaska
Attn: John Hadjukovich
4750 Old Intl Airport Road
Anchorage, AK 99502

Dear Mr. Hadjukovich:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to a briefing on the Barrow Airport Master Plan update. The master plan update provides an opportunity to review all features of the airport and its operation and plan for its future. In addition, the master plan update is an important requirement enabling the ADOT&PF to receive Federal Aviation Administration funding to support current and future projects at the Barrow airport.

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August 1, 2013

FAA
Attn: Jim Krause
222 West 8th Avenue #A36
Anchorage, AK 99513

Dear Mr. Krause:

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August 1, 2013

Frontier Flying Service, Inc.
Attn: Jim Hajdukovich
5245 Airport Industrial Way
Fairbanks, AK 99709

Dear Mr. Hajdukovich:

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August 1, 2013

Hageland Aviation Services, Inc.
Attn: Mike Hageland
P.O. Box 220610
Anchorage, AK 99522

Dear Mr. Hageland:

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August 1, 2013

Inupiat Community of the Arctic Slope
Attention Executive Director Doreen Lampe
PO Box 278
Barrow, AK 99723

Dear Executive Director Lampe:

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August 1, 2013

Northern Air Cargo
Attn: General Manager
3900 Old Intl Airport Road
Anchorage, AK 99502

Dear General Manager:

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August 1, 2013

Price Brower
North Slope Borough Search and Rescue, Director
P.O. Box 69
Barrow, AK 99723

Dear Mr. Brower:

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August 1, 2013

Wiley Contrades
North Slope Borough Planning and Community Services Division Manager
P.O. Box 69
Barrow, AK 99723

Dear Mr. Contrades:

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August 1, 2013

Peggy Cowan
Superintendent
North Slope Borough School District
P.O. Box 169
Barrow, AK 99723

Dear Ms. Cowan:

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August 1, 2013

Gordon Brower
North Slope Borough Planning and Community Services Deputy Director
P.O. Box 69
Barrow, AK 99723

Dear Mr. Brower:

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August 1, 2013

Eva Kinneeveauk
School Board President
North Slope Borough School District
P.O. Box 169
Barrow, AK 99723

Dear Ms. Kinneeveauk:

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August 1, 2013

Mari Moore
North Slope Borough Planning and Community Services Division Manager
P.O. Box 69
Barrow, AK 99723

Dear Ms. Moore:

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August 1, 2013

Charlotte Brower, Mayor
North Slope Borough
P.O. Box 69
Barrow, AK 99723

Honorable Mayor Brower:

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We look forward to working with you.

Sincerely,

Jeffery A. Roach
Project Manager

"Get Alaska Moving through service and infrastructure."

THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Transportation and Public Facilities

NORTHERN REGION
PLANNING

2301 PEGER ROAD
FAIRBANKS, ALASKA 99709-5316
Main: 907-451-5151
TDD: 907-451-2363
FAX: 907-451-2313

August 1, 2013

Marvin Olson, Public Works Director
North Slope Borough
P.O. Box 69
Barrow, AK 99723

Dear Mr. Olson:

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August 1, 2013

Rhoda Ahmaogak
North Slope Borough Planning and Community Services Director
P.O. Box 69
Barrow, AK 99723

Dear Ms. Ahmaogak:

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August 1, 2013

US Dept. of Commerce, National Weather Service
Attn.: Rosita Brown
7600 Sand Point Way NE #C15700
Seattle, WA 98115

Dear Ms. Brown:

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August 1, 2013

Theodore W. Popely
645 G Street, #524
Anchorage, AK 99501

Dear Mr. Popely:

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August 1, 2013

Gary Wayne Quarles
17122 Laoana
Eagle River, AK 99577

Dear Mr. Quarles:

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August 1, 2013

Ryan Air, Inc.
Attn: General Manager
5701 Silverado Way Unit L
Anchorage, AK 99518

Dear General Manager:

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August 1, 2013

David M. Klopp
Vice President-Operations and General Manager
UIC Construction Services
3201 C Street, Suite 801
Anchorage, AK 99503

Dear Mr. Klopp:

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August 1, 2013

Richard Reich, General Manager
Ukpeaġvik Iñupiat Corporation
6700 Arctic Spur Rd
Anchorage, AK, 99518

Dear Mr. Reich:

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August 1, 2013

Delbert Rexford, Vice President of Lands
Ukpeaġvik Iñupiat Corporation
PO Box 890
Barrow, AK 99723

Dear Mr. Rexford:

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August 1, 2013

Debra Shontz
ASRC SKW Eskimos
P.O. Box 129
Barrow, AK 99723

Dear Ms. Shontz:

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August 1, 2013

US Postal Service
Attn: Manager, PO Operations
3720 Barrow St
Anchorage, AK 99599-9992

Dear Manager, PO Operations:

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Anne Brooks <a.brooks@brooks-alaska.com> August 9, 2013 11:10 AM
To: camden@brooks-alaska.com
Reply-To: a.brooks@brooks-alaska.com
Barrow Airport Master Plan Update - Open House Monday, August 19th

Barrow Airport Master Plan Update

AKSAS Project No. 61974

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to attend an Open House Meeting to discuss the current status of the Barrow Airport Master Plan Update.

Public Open House

When: Monday, August 19th, 2013
Where: North Slope Borough Assembly Chambers
1274 Agvik St, Barrow
Time: Stop by any time between 6 and 8 p.m.
Presentation at 6:15 p.m.
Refreshments will be provided

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Visit the project website dot.alaska.gov/nreg/barrowmp to learn more about the project and schedule.

For additional information contact:
Public Involvement Coordinator
Anne Brooks
Brooks & Associates
Toll free: 1-907-535-1877
Email: mycomments@brooks-alaska.com

The ADOT&PF operates Federal Programs without regard to race, color, national origin, sex, age, or disability. Full Title VI Nondiscrimination Policy: dot.alaska.gov/tvi_statement.shtml. To file a complaint go to: dot.alaska.gov/cvlrts/titlevi.shtml.

Brooks and Associates | 301 West Northern Lights Blvd | Suite 440 | Anchorage | AK | 99503

Public Meeting for the Barrow Airport Master Plan Update

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For more information contact:
Anne Brooks, Public Involvement Coordinator
1-866-535-1877
mycomments@brooks-alaska.com

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Attachments, History, Details

Attachments
None

Revision History
Created 8/9/2013 9:40:32 AM by plord
Modified 8/9/2013 9:51:31 AM by plord
Modified 8/9/2013 9:58:15 AM by plord

Details

Department:	Transportation and Public Facilities
Category:	Public Notices
Sub-Category:	
Location(s):	Barrow
Project/Regulation #:	61974
Publish Date:	8/9/2013
Archive Date:	8/20/2013
Events/Deadlines:	Public Meeting 8/19/2013 6:00pm - 8:00pm View on Map

"Ostebo, Thomas P RADM" <Thomas.P.Ostebo@uscg.mil> August 12, 2013 9:14 AM
To: Anne Brooks
RE: Barrow Airport Master Plan Update - Open House Monday, August 19th

---

Anne thanks for the info on this. My folks are all over it and excited about the opportunities a new facility could bring for all.

tpo

-----Original Message-----
From: Anne Brooks [mailto:anne@brooks-alaska.ccsend.com] On Behalf Of Anne Brooks
Sent: Friday, August 09, 2013 11:10 AM
To: Ostebo, Thomas P RADM
Subject: Barrow Airport Master Plan Update - Open House Monday, August 19th

<http://r20.rs6.net/on.jsp?
t=1114431798497.0.1101949899075.5227&ts=S0945&r=3&o=http://ui.constantcontact.com/images/p1x1.gif>

<http://ih.constantcontact.com/fs192/1101949899075/img/21.jpg>

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Forward email <http://ui.constantcontact.com/sa/fwtf.jsp?llr=dkekvicab&m=1101949899075&ea=thomas.p.ostebo%40uscg.mil&a=1114431798497>
<http://visitor.constantcontact.com/do?p=un&mse=001Qo1SzxA2oRTaFdKIxqzICZc8IQFpvRX5&t=001M1VSSLeVy5XzYwMjv9tP0w%3D%3D&reason=001IqezpQbqEsU%3D&llr=dkekvicab> <http://www.constantcontact.com/index.jsp?cc=press01>
This email was sent to thomas.p.ostebo@uscg.mil by a.brooks@brooks-alaska.com |
Update Profile/Email Address <http://visitor.constantcontact.com/do?p=oo&mse=001Qo1SzxA2oRTaFdKIxqzICZc8IQFpvRX5&t=001M1VSSLeVy5XzYwMjv9tP0w%3D%3D&reason=001IqezpQbqEsU%3D&llr=dkekvicab> | Instant removal with SafeUnsubscribe <http://visitor.constantcontact.com/do?p=un&mse=001Qo1SzxA2oRTaFdKIxqzICZc8IQFpvRX5&t=001M1VSSLeVy5XzYwMjv9tP0w%3D%3D&reason=001IqezpQbqEsU%3D&llr=dkekvicab> (tm) | Privacy Policy <http://ui.constantcontact.com/roving/CCPrivacyPolicy.jsp> .
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Barrow Airport
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- Draft Aviation Demand Forecast

Public Open House

WHEN: ***Monday***
August 19, 2013
6-8 pm
Presentation begins at 6:15 pm

WHERE: North Slope Borough
Assembly Chambers
1274 Agvik Street, Barrow

Refreshments will be provided.

The ADOT&PF operates Federal Programs without regard to race, color, national origin, sex, age, or disability. Full Title VI Nondiscrimination Policy: dot.alaska.gov/tvi_statement.shtml. To file a complaint go to: dot.alaska.gov/cvlrts/titlevi.shtml.

For more information contact:

Brooks & Associates
Anne Brooks, P.E.
Public Involvement Specialist
Toll free: 1-866-535-1877
E-mail: mycomments@brooks-alaska.com

AKSAS Project No. 61974

dot.alaska.gov/nreg/barrowmp

Brooks & Associates
1704 Bannister Road
Anchorage, AK 99508-4021

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Barrow Airport
Master Plan Update

Public Open House
Monday, August 19, 2013

The Arctic Sounder

CASE/PO/AIO: ABSAS Project # 61974
AD# or identifier: Barrow Airport Master Plan Update

REMIT TO: Alaska Media, LLC
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Anchorage, AK 99524
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INVOICE(S): 6048

AFFIDAVIT OF PUBLICATION

UNITED STATES OF AMERICA STATE OF ALASKA, THIRD DISTRICT BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC THIS DAY PERSONALLY APPEARED **John Woodbury** WHO, BEING FIRST DULY SWORN, ACCORDING TO LAW, SAYS THAT HE IS **Publisher** OF **The Arctic Sounder** PUBLISHED AT **6921 Brayton Drive, Anchorage, AK 99507**, IN SAID THIRD DISTRICT AND STATE OF ALASKA AND THAT THE ADVERTISEMENT, OF WHICH THE ANNEXED OR ATTACHED IS A TRUE COPY, WHICH WAS PUBLISHED IN SAID PUBLICATION 8/15/13 AND THEREAFTER FOR A TOTAL OF 1 CONSECUTIVE ISSUE(S), THE LAST PUBLICATION APPEARING ON 8/15/13.	ATTACH PROOF OF PUBLICATION HERE
JOHN WOODBURY PUBLISHER SUBSCRIBED AND SWORN BEFORE ME THIS 15th day of August, 20 13	
KATHLEEN L SEWARD NOTARY PUBLIC STATE OF ALASKA MY COMMISSION EXPIRES ON FEBRUARY 1, 2017. STATE OF ALASKA NOTARY PUBLIC Kathleen L. Seward My Commission Expires Feb 1, 2017	

New grant awarded for Stellar sea lion research

Grants distributed between 10 states and two tribal agencies working to preserve mammals

BY JOSEPH MILLER
Bristol Bay Times-Dutch Harbor Fisherman

Steller sea lion have been declining in Alaska and elsewhere for years, and research funded through The National Oceanic and Atmospheric Administration's National Marine Fisheries Service will hopefully help unravel part of the mystery of why.

The National Oceanic and Atmospheric Administration's National Marine Fisheries Service recently announced $3.6 million in grants through the Species Recovery Grant Program to assist 10 coastal states and two federally recognized tribes with conservation projects designed to recover marine mammals, sea turtles and fish species listed under the Endangered Species Act.

Lisa Manning, the Species Recovery Grant Coordinator for NOAA said that over the next three years, pressing questions that have been difficult to answer in previous years regarding the declining Steller Sea lion population will be answered.

"This is a great partnership with the State and research. The animals that are targeted by the grant have been logically hard to sample," Manning said. "Researchers no longer think that food scarcity and prey limitations are keeping these animals in endangered status. This study will focus more on contaminants."

It was under these grants that the Alaska Department of Fish and Game was awarded $527,810 this year to be spent on "identifying the level and prevalence of mercury and organochorine contamination in the endangered western Steller Sea lion population to access potential links between continued declines and anthropologic contaminant sources."

The animals that are listed in Alaska are the beluga whale, the bowhead whale, and the Steller sea lion. The State of Alaska only became eligible to apply for these Species Recovery Grants in December of 2009, and this year is the first that Alaska Fish and Game has received a grant.

The question of exactly where the mercury and organochorine contaminants come from is a question that can't be answered by this study, but hopefully with the findings of new research, it will be the next question.

"Researchers did a pilot study on contaminants that lead them to pursue this hypothesis. One possible explanation is the contaminants coming from Russia, but more research is needed to find out exactly where it comes from. This research will focus on finding the contaminant and then linking it to the Steller Sea lion's diet. The next step down in finding the source," Manning said. "The hypothesis that the contaminants in the Steller Sea lion's diet can lead to neurological and reproductive problems. The goal is to find the link between the declining Sea lion population and the organochorinies that are hypothesized to be contaminating the food source."

Steller Sea lions as a species have been divided into two separate categories as a way to distinguish population between different Critical Habitat areas, otherwise known as the Eastern and Western distinct population segments (DPS). The Steller Sea lion Western DPS was listed as endangered in 1997. The Eastern DPS is listed as threatened. A major population decrease was first noticed in the Aleutians during the mid 1970s and the overall population had shrunk to 110,000 by the late 1970s. The steepest population drops came in the late 1980s where the Stellar Sea lion population would drop 15 percent every year. By 1990, the decline rate had slowed to 5.4 percent every year, but the Steller Sea lion population lingered around 30,525. In 1997, The National Marine Fisheries Service (NMFS) divided the Steller Sea lions into the Eastern and Western population segments.

This grant awarded to Alaska Fish and Game will be used primary to research the extent of contamination in the Western DPS Steller Sea lion population in Critical Habitat areas, which are defined as "specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservations, and those features may require special management considerations for protection" and "specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation", according to the Endangered Species Act.

The Makah Tribe in Washington was also issued the species recovery grant this year to monitor the health, distribution and vital rates of the Eastern DPS Stellar Sea lion. The Makah Tribe got another grant on Steller Sea lions and Gray Whales this year. This is the third grant that they've received in the past couple years, and they've already succeeded twice," Manning said.

While it is unclear as to what the findings of the new study will be, there is a definite hope for the population growth of the Steller Sea lion. Since the late 1970's the Eastern Distinct Population Segment of the Steller Sea lion has been growing 3 percent annually. Despite the problems that face the Eastern and Western populations of Steller Sea lions, it is clear that the grants that come from the Species Recovery Grants Program is helping significantly in finding the answers to the population decline of these marine mammals.

The money that comes from these grants will continue to allow viable progress to be made in the research that is needed in order to help these animals increase their numbers and perhaps eventually, remove the Steller Sea lion from the Endangered Species List.

Public Notice for North Slope Borough Nominating Petition to File for Candidacy for Name to Appear on the Official Ballot of the North Slope Borough General Election to be Held on October 1, 2013

North Slope Borough Nominating Petition Forms will be available at the **NSB Clerk's Office and NSB Village Liaisons' Offices on June 24, 2013.**

All nomination papers comprising a petition shall be assembled and filed with the clerk during office hours as one instrument not earlier than ninety (90) days or later than forty (40) days before the election.

Filed with the clerk means filing in person, filing electronically, and filing by certified mail. Filing electronically includes filing by email or by facsimile not earlier than ninety (90) days or later than forty (40) days before the election. **When filing electronically the original nomination papers must be received by the clerk no later than twenty-six (26) days before the election.** Filing by certified mail must be postmarked or date stamped not earlier than ninety (90) days or later than forty (40) days before the election and must be received by the clerk no later than twenty-six (26) days before the election. Per NSB Charter Section 6.040.

Assembly seats are currently filled by:

Seat "C"	District 3, Barrow	3 Year Term	Mike Aamodt
Seat "D"	District 1, Point Hope and Point Lay	3 Year Term	Herbert Kinneeveauk, Jr.
Seat "E"	District 2, Wainwright and Atqasuk	3 Year Term	George Agnasagga

Board of Education seats are currently filled by:

Seat "C"	Barrow	Mary Sage
Seat "D"	Point Hope and Point Lay	Eva Kinneeveauk

Jeannie Brower, CMC, Borough Clerk

June 27, July 4, 18, August 8, 22, 2013
Date

Notice of Intended Disposition

Notice is here given in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA), 43 CFR 10.6 (c), of the intent to transfer custody of Native American human remains in the control of the U.S. Department of the Interior, National Park Service, Kobuk Valley National Park.

A detailed assessment of the human remains was made by Kobuk Valley National Park officials in consultation with representatives of the Native Village of Ambler, Native Village of Kiana, Native Village of Kobuk, Native Village of Kotzebue, Native Village of Selawik, Native Village of Shungnak, and Noorvik Native Community. The Native Villages of Ambler, Kobuk, Kotzebue, Noorvik, Selawik, and Shungnak deferred to the Native Village of Kiana as the tribe with the strongest affiliation to the site.

In July 2013, human remains were removed from Site XBM-047 (Igliqtiqsiugvigruaq), located along the Kobuk River in Kobuk Valley National Park. Archeologist Dr. Douglas D. Anderson conducted excavations under NPS Research and Archeological Resources Protection Act Permits. No known individuals were identified.

Officials of Kobuk Valley National Park have determined that, pursuant to 43 CFR 10.2 (d)(1), the human remains described above represent the physical remains of three individuals of Native American ancestry.

Lastly, officials of Kobuk Valley National Park have determined that, pursuant to 43 CFR 10.5 (a), a relationship of shared group identity can be reasonably traced between the human remains and the Native Village of Kiana.

Representatives of any other Indian tribe or Native Hawaiian organization that wishes to claim ownership or control of the human remains should contact Frank Hays, Superintendent, Kobuk Valley National Park, P.O. Box 1029, Kotzebue, Alaska 99752, telephone (907) 442-8301, before September 23, 2013. Disposition of the human remains to the Native Village of Kiana may proceed after that date if no additional claimants come forward.

Kobuk Valley National Park is responsible for notifying the Native Village of Ambler, Native Village of Kiana, Native Village of Kobuk, Native Village of Kotzebue, Native Village of Selawik, Native Village of Shungnak, and Noorvik Native Community that this notice has been published.

Northwest Arctic Borough

SERVING THE COMMUNITIES OF:
Ambler Buckland Candle Deering Kivalina Kiana
Kobuk Kotzebue Noatak Noorvik Selawik Shungnak

PUBLIC NOTICE

ABSENTEE VOTING

Any voter of the Northwest Arctic Borough who expects to be absent from their election precinct or who will be unable to vote by reason of physical disability on October 1, 2013, may cast an ABSENTEE BALLOT. A person who seeks to vote by absentee ballot may file either in person or by mailing their written application to the Borough Clerk.

The Borough Clerk will accept applications made BY MAIL, which should be received no earlier than September 12, 2013 and no later than September 27, 2013.

The Borough Clerk will accept applications made IN PERSON no earlier than September 16, 2013 and no later than October 1, 2013. The issuance or acceptance of absentee voting ballots will be during normal business hours. The office hours of the Northwest Arctic Borough are from 8:00 A.M. to 4:30 P.M. Monday through Friday.

ALL applications must be signed by the applicant and show their place of residence.

There is nothing that limits the Borough Clerk in personally delivering a ballot to a person who is unable to make application in person at the Clerk's office for an absentee voter's ballot.

Please contact the Borough Clerk's Office if you have any questions regarding absentee voting at 442-8205 or toll-free at (800) 478-1110.

Public Comments <mycomments@brooks-alaska.com> August 15, 2013 7:58 AM
To: Dallas-Lee Brower <dl@barrow.com>
Cc: Public Comments <mycomments@brooks-alaska.com>, "Jeffery A (DOT) Roach" <jeff.roach@alaska.gov>, Patrick Cotter <PatrickCotter@pdceng.com>
Re: Barrow Airport Meeting

Dallas -- we will post the meeting presentation and notes to the project web site. Look for them at the following link about two weeks after the meeting. Don't hesitate to give us a call if you have any questions or comments on the master plan update.

M. Anne Brooks P.E.
Public Involvement Specialist
Brooks & Associates
E-mail: mycomments@brooks-alaska.com
Tel: 907-272-1877
Toll Free: 866-535-1877

On Aug 15, 2013, at 12:36 AM, Dallas-Lee Brower <dl@barrow.com> wrote:

Dear Brooks & Associates,

As I am departing for New York tomorrow and will not return to Barrow until August 24th, which means I will miss your Barrow Airport meeting. Would you be so kind and send me the minutes or whatever you have available about it?

Thank you,

Dallas-Lee Brower
P.O. Box 1336
Barrow, AK 99723
email: dl@barrow.com

Anne Brooks <a.brooks@brooks-alaska.com> August 16, 2013 8:02 AM
To: camden@brooks-alaska.com
Reply-To: a.brooks@brooks-alaska.com
Reminder: Barrow Airport Master Plan Update - Open House Monday, August 19th

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Barrow Airport Master Plan Update

AKSAS Project No. 61974

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to attend an Open House Meeting to discuss the current status of the Barrow Airport Master Plan Update.

Public Open House
When: Monday, August 19th, 2013
Where: North Slope Borough Assembly Chambers
1274 Agvik St, Barrow
Time: Stop by any time between 6 and 8 p.m.
Presentation at 6:15 p.m.
Refreshments will be provided

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to a second public meeting on the Barrow Airport Master Plan update. The master plan update provides an opportunity to review all features of the airport and its operation and plan for its future. In addition, the master plan update is an important requirement enabling the ADOT&PF to receive Federal Aviation Administration funding to support current and future projects at the Barrow airport.

The project team has completed the following portions of the update:

- Inventory of Existing Conditions and Issues
- Land use Assessment
- Environmental Overview
- Summary of Existing and Potential issues
- Draft Aviation Demand Forecast

Visit the project website dot.alaska.gov/nreg/barrowmp to learn more about the project and schedule.

For additional information contact:
Public Involvement Coordinator
Anne Brooks
Brooks & Associates
Toll free: 1-907-535-1877
Email: mycomments@brooks-alaska.com

The ADOT&PF operates Federal Programs without regard to race, color, national origin, sex, age, or disability. Full Title VI Nondiscrimination Policy: dot.alaska.gov/tvi_statement.shtml. To file a complaint go to: dot.alaska.gov/cvlrts/titlevi.shtml.

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Brooks and Associates | 301 West Northern Lights Blvd | Suite 440 | Anchorage | AK | 99503

Barrow Airport Master Plan Update

Project No. 61974

MEETING NOTES

SUBJECT:	Barrow Airport Master Plan Update
PROJECT NO.:	ADOT&PF: 61974
GROUP:	Public
DATE:	Monday, August 19, 2013
TIME:	11 a.m. to 12 p.m. for local government and utilities, 1 p.m. to 1:45 p.m. for tribal entities, 2 p.m. to 2:45 p.m. for adjacent landowners, and 6 pm to 8 pm for the general public, presentations were made at each meeting.
LOCATION:	North Slope Borough Assembly Chambers
MEETING OUTREACH:	See Table 1. Meeting Outreach
MEETING ATTENDANCE:	54 people signed in
MEETING MATERIALS:	Aerial photo with movable cut-outs of components, aerial photos with concepts, comment sheets, fact sheet, sign-in sheet, PowerPoint presentation
STAFF PRESENT:	*ADOT&PF*: Jeff Roach, John Olsen, Tom Kowalczyk
	FAA: Pat Oien, Patricia Sullivan
	PDC Engineers: Patrick Cotter, Royce Conlon
	Brooks & Associates: Camden Yehle, Public Involvement
	ABR, Inc.: Wendy Davis
	NLUR Alaska, LLC: Richard Stern

MEETING INFORMATION:

Attendees were greeted at the door, asked to sign-in, and briefed on the meeting format. A series of meetings were held at 11 a.m. for Local Government; at 1 p.m. for Tribal Entities and at 2:00 p.m. for Adjacent Landowners. Patrick Cotter made a presentation at the beginning of each meeting and answered questions throughout. Pizza and beverages were provided for the meeting at 6 p.m.

The team received no written comments at the meetings.

The following verbal comments, questions and the team's responses were captured by project team at the meeting and are sorted by topic. The comments and questions are in regular type, with the team responses in *italic.*

Airport Relocation

- Why is moving the airport not being considered in this master plan update? *It would cost upwards of $600,000,000 and the state of Alaska only gets about $200,000,000 annually? for all aviation projects statewide. This makes moving the runway cost prohibitive. There are also the serious environmental factors of covering up a big piece of undisturbed* *tundra.*

- If the airport were to be relocated – where would that be? *Airport relocation is not part of our analysis for this master plan update; therefore, we didn't look at specific locations.*
- That isn't true – relocation options were considered in the past. *In the previous Barrow Airport Master Plan (AMP) studies relocation was considered, but is not part of this update.*
- The shoreline is eroding at a foot per year. The end of the runway will disappear. Shouldn't you be considering relocation so the community could build on the existing runway and move away from flood prone areas? *This is not something that the project team has looked at specifically, however there has been no indication that this is an immediate or even a long-term risk.*
- Have you consulted FEMA? More and more flooding has been happening. *The airport is built above the 100-year flood level so barring a natural disaster no immediate risks are foreseen.*
- Given the mega money that the oil industry is proposing to get out of this area doesn't it make sense to invest money now into relocation rather then pouring little bits in that end up amounting to lots of money over long term?
- If Barrow explodes, will moving the airport be on the table? *If there are significant changes in circumstances the master plan will be revisited. A new master plan is typically completed every 10-15 years.*

Runway Length

- Is it possible to extend the runway? *Extending the runway is no longer under consideration because of the ocean on one side and the lagoon on the other. Extending the runway either way would present serious engineering challenges and would be prohibitively expensive. Issues include:*
    - *There is a drop-off on the ocean side that would take a lot of material to fill in.*
    - *An extension on the ocean side could block vehicle access to the south.*
    - *With an extension on the lagoon side there is a risk of contamination to drinking water during construction, use, and maintenance.*

  Operational and technological changes will have to be considered instead to effectively lengthen the runway. These options include:

    - *An Engineered Materials Arrestor System (EMAS) that uses a crushable material to stop planes that have overshot the runway would effectively lengthen the available runway by reducing the runway safety area needed.*
    - *Using more sand and de-icing so that carriers can fly heavier in worse weather.*
    - *Carriers can fly lighter when the weather is worse. This is how they are flying currently because their heavier loads are in the summer when the weather is better.*

- The west materials site means pulling materials out where you really want to be putting materials in.
- There would be less impact by developing the south side.
- What is the timeline for getting you UIC's input on their preferred alternative? *In the next couple weeks would be best. The whole master plan update will be completed by the end of the year, but there will be one more public meeting in November to look at the proposed preferred alternative. Comments will be taken into consideration at that time as well.*
- Are you collaborating with UIC about the material sites? *Yes, they provided the permits to do the test drilling.*
- Consider the Corps of Engineers' material site because birds use both of the proposed material sites.
- How many flights would be waved off if there were south-side development and not south-side taxiway? *We don't have that information at this time.*
- Why not move all the new lease lots to one end on the south side of the runway? That way there could be just a small section of taxiway built on the south side. *According to FAA regulations, in order to maintain the current approach minimum, a full-length taxiway would have to be built if there was any development on the south side of the runway.*

Northeast Development

- Is the full-length taxiway required on the north side of the runway? *The taxiway is mostly there, but if more lease lots were to be developed on the northeast end, the taxiway would most likely need to be extended.*
- In Concept 2 (where new lease lots are being proposed in the northeast corner) it looks like a lot of new traffic pushed into a residential neighborhood.
- Three years ago the Borough tried to develop this northeast area but was quickly told due to noise and traffic impacts to the residential it wasn't good idea. Has that changed? *No, it is possibly still a concern due to the residential use, but we are presenting it to see if it is still a concern.*

Relocation of Ahkovak Street

- One commenter expressed support for Concept 3 (moving Ahkovak Street to the northern airport property line) because it would mean more parking, snow storage space, and safer equipment use.
- How many buildings would have to be relocated if Ahkovak Street was moved to the north? *Five to six buildings would need to be relocated. Many of the buildings are already empty and three of the lots are parking reserves.*
- What would happen to the leaseholders if the road is moved? *ADOT&PF and those leaseholders would go through the formal right of way (ROW) acquisition process that includes helping businesses find suitable locations and compensating them fairly.*

- There would be more noise and the road would be closer to the residences on the next road to the north if Ahkovak Street were moved north.

Leaseholders and Lease Lots

- Is combining the terminals part of the master plan? *The carriers would have to decide to build a common terminal. ADOT&PF can't force leaseholders to share a building.*
- What would the effect be on current leaseholders under the proposed concepts? *There would be no effect on the current leaseholders other than that under some of the concepts there would be the potential for them to expand.*
- Will there be a hanger for small planes? *It would take state funding to build a pad for a small plane hangar and it would have to be requested through the state legislature.*
- Next time please bring a close up of the lease lots. *There are opportunities to relocate parking reserves that are in bad places or are otherwise under-utilized or under-developed.*
- Is ADOT&PF going to make sure that leaseholders have enough parking, snow storage, etc.? *No, ADOT&PF only considers aviation use when deciding to lease a lot. We are not allowed to tell leaseholders what or how to build.*
- Does ADOT&PF have any ability to enforce fire marshal codes for terminals? *It is up to the lessee to comply with the fire codes.*
- How much land is available for expansion and development? *The airport property is over 700 acres. Under the concepts that are currently being discussed, new lease lots will be 300 by 300 feet. Under some of the concepts the existing lease lots will also be able to expand.*
- Will there be a crackdown on folks using their lease lots for non-aviation uses? *Anyone with a concern about misuse of lease lots can report it to the airport manager or ADOT&PF.*

US Coast Guard

- What kind of presence would the Coast Guard have? *They need a place to house their planes and helicopters on the northern coast of Alaska. They need to monitor any offshore drilling and increased use of the Bering Strait. This base could be in Barrow, however it hasn't been determined yet.*
- Is a residential military facility being considered in the master plan? *The State Department of Military and Veterans Affairs and the US Coast Guard have been working with us to establish how much space they would need.*
- Can you speak to the Coast Guard presence in Barrow? *Yes we have been working with them – at this point the Department of Military and Veterans Affairs has no means to get lease.*

Master Plan Development and Forecasts

- If it weren't for the oil companies would ADOT&PF be doing the master plan update? *Yes, there is an immediate need for storage of a new de-icing chemical and a projected* *increase of use and size of aircraft. If the oil industry was not planning on investing, the proposed developments would be scaled back.*

- Is there a correlation between oil industry science activities and research that impacts the forecast? *We did get numbers related to the Shell travel last year from Miami Air, but it is difficult to sort out the travel directly related to science & research.*
- The forecast only showed 2012 but we are in 2013. *The base year is 2012 because the 2012 data is complete.*
- Are you just looking at passengers and facilities? *We forecast based on passengers and cargo.*
- Which airport growth rate are you using to establish the alternatives? *We are using the medium growth forecast because it fits the current level of use and development the most accurately.*
- How did you calculate the growth rate? *The growth rate was calculated from a combination of factors including passenger enplanements, Gross Domestic Product (GDP), population, price of oil, and tourism.*
- How does this forecast compare to the forecast in the last master plan? *The high growth rate for this master plan is 3%, the high growth rate for the last master plan was 2%.*
- Has tourism been considered? We have them by busloads. A new three-story hotel with 70 rooms will be built next year so that Barrow can accommodate more visitors. *Yes, tourism has been taken into account; we received tourist numbers from local tour companies and the visitor center. It represents a small percentage of the enplanements at this time.*
- Who are the key stakeholders involved in the master plan to date? *UIC, USFW, Local Government, Native Groups…DEC etc.*

Preferred Alternative

- How is the preferred alternative picked? *An evaluation process considering various factors such as cost, environmental, etc., A matrix with weights and scores will be used during a day long work session with ADOT&PF and the consultant team. The team will rank the alternatives.*
- Where does the preferred alternative go and is it what is going to happen? *Ultimately the preferred alternative will go into the new master plan, but the alternatives are not set in stone and there are many factors that could be cause to revisit the plan. These factors could be the start of onshore or offshore oil and gas production, decreased exploration, population trend change, etc.*

Funding

- Where does the funding originate? *More that 90% of new construction is federally funded; maintenance and operations is funded by the state.*
- Has the industry been asked to foot some of the bill for improvements or for building a crosswind airstrip? *No, there is no landing fee here, unlike Anchorage and Fairbanks. Also a crosswind airstrip would be useful only 7% of the time. The wind lines up with the*

existing airstrip 93% of the time. If the industry decided to build a facility it would be driven by industry not ADOT&PF.

Emergency Use of Barrow Airport

- Can a Coast Guard C-17 land on the existing runway? *Yes, they are designed for short landing and takeoff.*
- Can big jets land here in an emergency during over-pole flights? *Airlines are working on their own emergency plans, but we know that Barrow and Deadhorse are under consideration for emergency landings. Jeff indicated that ADOT&PF has been in contact with an Asian carrier and are working with them to identify emergency landing areas such as Barrow.*

Security

- Will increased use of the airport change FAA security requirements or procedures? What is stopping terrorist attacks? *The current numbers don't change the level of security. A substantial increase in the number of passengers per plane would warrant a security increase. The FAA decides when to put in a control tower and they are not planning on adding any towers. The master plan update will consider more fencing for security.*

Other comments:

- One commenter pointed out that in Barrow nothing is cost effective.

Comments received by social media:

- Total there were 24 shares, 109 likes, and 6 comments on the ADOT&PF Facebook page. There were no re-tweets on Twitter.
- Sounds like an evening of interesting topics.
- What we need is a bigger airport and a bigger parking area.
- Yep. Need to relocate the airport building, but make a bigger one with a jet way. And bigger parking area too.
- As long as we able to fly and land off the runway it's all good. So what's wrong with this strip?
- Wish we had a jet way instead of always going outside. I keep seeing Elders having to go out in the cold and usually wet conditions, and people with small children too. It would be nicer to load and unload in a building.
- Runway is good they just need a bigger building the layout is bad.

Email comments received prior to and immediately after the meeting:

- One person requested information about how to get the meeting notes because he will miss the meeting. He was directed to the project website http://dot.alaska.gov/nreg/barrowmp/.

- One email expressed excitement “about the opportunities a new facility could bring for all.”
- [As] a pilot at Search and Rescue on the field. Helicopters are particularly noisy and obnoxious at times. I am guilty of making helicopter noise at all hours, and I truly understand their frustration. However, some vocal complainers and activists should be tolerant of the increased activity, for the following reasons:

  1. Our aircraft are often used to search and rescue their friends, relatives, and medevac family members. Generally late at night. We risk our lives sometimes to push the weather to serve our Slope. Often after an exhausting mission to serve our neighbors, we hear angry complaints about noise.

  2. Increased oil activity produces increased traffic. Often this work utilizes Native Corporations, which they certainly enjoy the increased dividend checks.

  3. Generally no one is forced to relocate near the airport. Then complain about aircraft noise?

  4. Part of living off the road system is dependence on aircraft. This is a choice.

  5. Some training must be done in the dark or twilight. Late hours is required at times to produce the proper conditions. We truly attempt to mitigate noise, and I try to leave the Barrow area for training when able. But there are times it must be done near the runway.

  6. Aircraft maintenance sometimes requires run-ups at late hours. This is done to get the aircraft back into service, and operational for public safety missions.

  7. As stated, we honestly try to mitigate noise. When noise is heard, it is a legitimate mission for public safety.

Table 1. Meeting Outreach

Date	Outreach method	Description
8/1/2013	Letter mailed to official stakeholders	A letter was mailed to all government officials, utilities, tribal entities, UIC, and SKW to invite them to small group meetings preceding the public meeting.
8/7/2013	Project website	Project specific website hosted on the Brooks and Associates server and be formatted in accordance with Department specifications.
8/7/2013	Postcard mailer	Inviting the public to the 8/19/13 meeting
8/8/2013	State of Alaska Online Notice	Inviting the public to the 8/19/13 public meeting
8/10/2013	Display advertising in	Inviting the public to the 8/19/13 meeting

	Fairbanks Daily News Miner	
8/12/2013	Display advertising in *Anchorage Daily News*	Inviting the public to the 8/19/13 meeting
8/15/2013	Display advertising in *Arctic Sounder*	Inviting the public to the 8/19/13 meeting
8/9/2013 8/16/2013	Constant Contact email and reminder	Provide email invitation to the meeting to project stakeholders
8/15/2013 – 8/18/2013	Facebook ad campaign	Facebook ad campaign inviting people to the public meeting and referring them to the project website.
8/12/2013 to 8/18/2013	Public service announcement request sent to GCI, KBRW-FM, and KBRW-AM	Sent with request to broadcast announcement inviting pubic to meeting.
8/15/2013 8/19/2013	Facebook update	Facebook post on the ADOT&PF page inviting people to the public meeting.
8/15/2013 8/19/2013	Twitter	Tweet on the ADOT&PF feed inviting people to the public meeting.

Related documents on file:

Aerial Graphics with Concepts
Comment Sheet
Display Advertising
Fact Sheet
Mailing List
Postcard Mailer
PowerPoint Presentation
Public Service Announcements
Sign in Sheets
Social Media Posts and Comments

Anne Brooks <a.brooks@brooks-alaska.com>
To: camden@brooks-alaska.com
Reply-To: a.brooks@brooks-alaska.com
Thanks for Coming! Barrow Airport Master Plan Update

August 23, 2013 3:20 PM

Barrow Airport Master Plan Update

AKSAS Project No. 61974

On behalf of the Alaska Department of Transportation and Public Facilities, thank you to all who attended the Barrow Airport Master Plan Update meeting on August 19th in Barrow. We value your input, questions and comments and hope that you choose to continue to be involved with the project.

There will be one more public meeting in November or December to receive comments on the proposed preferred alternative for the final master plan. Until then the project team will continue to take comments and questions by phone and email. Documents, including the notes and presentation from the meeting will be available on the website: http://dot.alaska.gov/nreg/barrowmp/documents.shtml

We look forward to continuing to work with you!

For additional information contact:
Public Involvement Coordinator
Anne Brooks
Brooks & Associates
Toll free: 1-907-535-1877
Email: mycomments@brooks-alaska.com

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Patrick Cotter <PatrickCotter@pdceng.com> August 26, 2013 7:27 AM
To: 'Anne Brooks' <a.brooks@brooks-alaska.com>, "Roach, Jeffery A (DOT) (jeff.roach@alaska.gov)" <jeff.roach@alaska.gov>
Cc: Royce Conlon <RoyceConlon@pdceng.com>, "camden@brooks-alaska.com" <camden@brooks-alaska.com>
FW: Personal input about the Brw airport master plan

Some comments from SAR.
-Pat

-----Original Message-----
From: Lynn Williamson [mailto:flystamper@gci.net]
Sent: Saturday, August 24, 2013 12:36 PM
To: Patrick Cotter
Subject: Personal input about the Brw airport master plan

My name is Steve Williamson, a pilot at Search and Rescue on the field. Helicopters are particularly noisy and obnoxious at times. I am guilty of making helicopter noise at all hours, and I truly understand their frustration. However, some vocal complainers and activists should be tolerant of the increased activity, for the following reasons:

1. Our aircraft are often used to search and rescue their friends, relatives, and medivac family members. Generally late at night. We risk our lives sometimes to push the weather to serve our Slope. Often after an exhausting mission to serve our neighbors, we hear angry complaints about noise.

2. Increased oil activity produces increased traffic. Often this work utilizes Native Corporations, which they certainly enjoy the increased dividend checks.

3. Generally no one is forced to relocate near the airport. Then complain about aircraft noise?.......

4. Part of living off the road system is dependence on aircraft. This is a choice.

5. Some training must be done in the dark or twilight. Late hours is required at times to produce the proper conditions. We truly attempt to mitigate noise, and I try to leave the Barrow area for training when able. But there are times it must be done near the runway.

6. Aircraft maintenance sometimes requires run-ups at late hours. This is done to get the aircraft back into service, and operational for public safety missions.

7. As stated, we honestly try to mitigate noise. When noise is heard, it is a legitimate mission for public safety.

Steve Williamson 907-337-9272

From: Anne Jensen [mailto:anne.jensen@uicscience.org]
Sent: Friday, November 15, 2013 6:06 PM
To: Valerie Webb
Subject: RE: BRW AMP November Steering Committee Update - REMINDER

Dear Valerie,

My comments are attached. I had to look at the supporting documentation, and the link did not work on an iPad, which led to a bit of delay. Sorry.

Anne M. Jensen, PhD, RPA
SENIOR SCIENTIST | **UIC SCIENCE LLC**
PO Box 955
Barrow, Alaska 99723
direct: 907-852-0924 | mobile: 907-230-8228 | Nuvuk lab: 907-852-0931
fax: 907-852-5763 | www.uicalaska.com
A Member of the Ukpeagvik Iñupiat Corporation Family of Companies

Replies to: anne.jensen@uicscience.org

From: Valerie Webb [mailto:ValerieWebb@pdceng.com]
Sent: Thursday, November 14, 2013 1:44 PM
To: Alice Edwards; Anne Jensen; Anthony Vogt; Bruce Greenwood; CDR Mike Pierson; D17 Facility Planner; Deputy Commissioner McHugh Pierre; Fred Parady; Geoff Carroll; Glenn Merrill; Gordon Brower; James Rypkema; Janice Wiegers; Jeanne Hanson; Jeff Roach; Jennifer Curtis, EPA; Jewel Bennett; Judy Bittner; Larry Dietrick; Lietenent Commander; Lon Kelly; Mari Moore; Ned Arey; Neesha Stellrecht ; Pat Oien; Patricia Sullivan; Patrick Cotter; Robert Johnson; Royce Conlon; Shina Duvall; Steve Bainbridge; Ted Swem; Tommy Nageak; William Morris; michiel.e.holley@usace.army.mil
Subject: BRW AMP November Steering Committee Update - REMINDER

REMINDER: Please note that we are asking to receive your comments on Barrow Airport's Preferred Build Alternative by **tomorrow, November 15, 2013.** To date, we have received comments from the North Slope Borough.

Please let me know if you have any questions or concerns.
Thank you.

Valerie Webb
Lead Environmental Analyst
PDC Inc. Engineers
Planning Design Construction
1028 Aurora Drive | Fairbanks, Alaska 99709
v 907.452.1414 | f 907.456.2707 | www.pdceng.com
"Transforming Challenges into Solutions"

From: Valerie Webb
Sent: Tuesday, November 05, 2013 11:15 AM
To: 'Alice Edwards'; 'Anne Jensen'; 'Anthony Vogt'; 'Bruce Greenwood'; CDR Mike Pierson; D17 Facility Planner; Deputy Commissioner McHugh Pierre; Fred Parady; 'Geoff Carroll'; 'Glenn Merrill'; Gordon Brower; James Rypkema; Janice Wiegers; 'Jeanne Hanson'; 'Jeff Roach'; Jennifer Curtis, EPA; Jewel Bennett; 'Judy Bittner'; 'Larry Dietrick'; Lietenent Commander; 'Lon Kelly'; Mari Moore; Ned Arey; Neesha Stellrecht ; 'Pat Oien'; 'Patricia Sullivan'; Patrick Cotter; 'Robert Johnson'; Royce Conlon; Shina Duvall; Steve Bainbridge; Ted Swem; Tommy Nageak; 'William Morris'; 'michiel.e.holley@usace.army.mil'
Subject: BRW AMP November Steering Committee Update

Attached please find the Barrow Airport Master Plan Update November Steering Committee Update for your review. The Alaska Department of Transportation and Public Facilities, in cooperation with the Federal Aviation Administration, requests your participation in the analysis of the Preferred Build Alternative.

A supplemental Environmental Evaluation Report is also available for your review on the ftp site. To access the file, click on the link below and enter the user name and password:

ftp://ftp.pdceng.us/Public/Barrow_MP/13y111m05d_Final November Steering Consultation/

User Name PDCFTPFBKS
Password FTPPassword1

Due to the number of figures in the Environmental Evaluation Report, the file size is relatively large (14.9 MB). If you would prefer a hardcopy, please feel free to contact me and I will mail you a copy.

We are requesting your comments by November 15, 2013. Please let me know if you have comments or concerns.

Thank you.

Valerie Webb
Lead Environmental Analyst
PDC Inc. Engineers
Planning Design Construction
1028 Aurora Drive | Fairbanks, Alaska 99709
v 907.452.1414 | f 907.456.2707 | www.pdceng.com
"Transforming Challenges into Solutions"

COMMENTS ON BARROW AIRPORT MASTER PLAN UPDATE

STEERING COMMITTEE UPDATE

Anne M. Jensen, PhD, RPA
UIC Science LLC
PO Box 955
Barrow, AK 99723
anne.jensen@uicscience.org

In general the Preferred Build Alternative addresses the majority of the concerns raised by UIC and other community members. The south side development fits well with community and UIC plans for that area. There are a few issues which will need further consideration. Some of them may be unavoidable within the requirements for modern airports; the issues that need to be considered are addressed below.

AHKOVAK STREET REALIGNMENT

This phase will involved considerable disruption of local businesses. While it is currently envisioned as being a long-term (11-20 years out) activity, this delay brings its own problems. Once it is known that this will happen, owners of structures that might be impacted will be reluctant to upgrade or even maintain them, as they will tend to see it as a waste of funds that may not be recoverable. The end result may be a degradation of the neighborhood around the airport. Some thought needs to be given to means to ameliorate this effect.

CULTURAL RESOURCES STUDIES

The Preferred Build Alternative addresses many of the cultural resources concerns. The know Birnirk burial area is avoided, which is helpful. However, the airport property seems to have been used fairly extensively for a long time. This document clearly recognizes that all phases of the planned development have the potential to impact cultural resources and that further studies will be needed to identify such resources, when the final alternative is selected and the actual on-the-ground impacts are known. The supporting document makes it clear that this includes field studies.

P. 15 of the steering committee update document is perhaps not as clear that field studies are necessary, stating that stakeholders should be indentified and consulted as to the location of cultural resources and potential historic properties on the airport property. While this is an essential step, it does not eliminate the need for careful pedestrian survey, with personal familiar with tundra environments and local archaeology, of all impact areas (including gravel sources, haul routes, lay-down areas, etc), supplemented as needed with shovel testing and/or GPR as appropriate, to delineate the boundaries of cultural resources. This work needs to be scheduled when the ground is exposed (no snow) and unfrozen enough to allow testing to a reasonable depth when necessary (most likely late summer). Perhaps a slight rewording to explicitly call out the need for field studies would be helpful. When this is not clear, the planning for field archaeology is often delayed, and it winds up either delaying the project or being done under conditions which are far from ideal in terms of surface visibility or depth of testing. Such rewording could do a lot to avoid issues with inadvertent discoveries of human remains.

The other steps listed are all very sensible, and if undertaken in a timely manner, should minimize the chance for inadvertent discoveries of human remains or cultural resources, and also provide a clear route forward if such discoveries do happen.

Not mentioned, but important to note, is that locations of sites in the ARHS files are not necessarily accurate. Some of them were apparently changed to improve the plotting of the sites on the old USGS maps, with the inadvertent result that the sites are not correctly located in most modern GIS mapping. Some AHRS sites that appear to map in the airport property are not located there. It is also possible that some sites that do not plot on the airport property are in fact located within airport boundaries.

Barrow Airport
Master Plan Update

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The draft document will be available for your review December 2nd on the project web site. dot.alaska.gov/nreg/barrowmp/documents.shtml.

PUBLIC MEETING

WHEN: **Wednesday**
December 4, 2013
6-8 pm

Team presentation begins at 6:15 pm

WHERE: North Slope Borough
Assembly Chambers
1274 Agvik Street, Barrow

Refreshments will be provided.

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TRANSPORTATION AND PUBLIC FACILITIES · STATE OF ALASKA

For more information contact:

Brooks & Associates
Anne Brooks, P.E.
Public Involvement Specialist
Toll free: 1-866-535-1877
E-mail: mycomments@brooks-alaska.com

AKSAS Project No. 61974

dot.alaska.gov/nreg/barrowmp

Brooks & Associates
1704 Rogers Park Court
Anchorage, AK 99508

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Barrow Airport
Master Plan Update

Public Meeting
Wed, December 4, 2013

Open House: Barrow Airport Master Plan Update/61974, December 4, 2013

When: December 4, 2013
Where: North Slope Borough Assembly Chambers, Barrow
Time: 6-8 p.m.

See attached flyer for details.

Attachments, History, Details

Attachments

Barrow Airport Master Plan Update 12-4-13 Open House flyer.pdf

Revision History

Created 11/19/2013 11:32:23 AM by plord

Details

Department:	Transportation and Public Facilities
Category:	Public Notices
Sub-Category:	
Location(s):	Barrow
Project/Regulation #:	61974
Publish Date:	11/19/2013
Archive Date:	12/5/2013
Events/Deadlines:	Open House 12/4/2013 6:00pm - 8:00pm View on Map

Barrow Airport Master Plan Update

AKSAS Project No. 61974

Public Open House
When: Wednesday, December 4th, 2013
Where: North Slope Borough Assembly Chambers
1274 Agvik St, Barrow
Time: Stop by any time between 6 and 8 p.m.
Presentation at 6:15 p.m.
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Email: mycomments@brooks-alaska.com

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Anne Brooks <a.brooks@brooks-alaska.com> November 19, 2013 8:33 AM
To: a.brooks@brooks-alaska.com
Reply-To: mycomments@brooks-alaska.com
Barrow Airport Master Plan Update - Open House, December 4

Barrow Airport Master Plan Update

AKSAS Project No. 61974

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Brooks and Associates | 301 West Northern Lights Blvd | Suite 440 | Anchorage | AK | 99503

268714
0000779424
$ 567.20

AFFIDAVIT OF PUBLICATION

STATE OF ALASKA
THIRD JUDICIAL DISTRICT

Joleesa Stepetin
being first duly sworn on oath deposes and says that he is a representative of the Anchorage Daily News, a daily newspaper. That said newspaper has been approved by the Third Judicial Court, Anchorage, Alaska, and it now and has been published in the English language continually as a daily newspaper in Anchorage, Alaska, and it is now and during all said time was printed in an office maintained at the aforesaid place of publication of said newspaper. That the annexed is a copy of an advertisement as it was published in regular issues (and not in supplemental form) of said newspaper on

November 21, 2013

and that such newspaper was regularly distributed to its subscribers during all of said period. That the full amount of the fee charged for the foregoing publication is not in excess of the rate charged private individuals.

Signed Joleesa Stepetin

Subscribed and sworn to before me this 21st day of November, 2013

Britney Thompson

Notary Public in and for
The State of Alaska.
Third Division
Anchorage, Alaska
MY COMMISSION EXPIRES
05/18/15

Barrow Airport
Master Plan Update
AKSAS Project No. 61974

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E-mail: mycomments@brooks-alaska.com

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Public Meeting

Wednesday December 4, 2013

6-8 pm

Team Presentation begins at 6:15 pm

North Slope Borough
Assembly Chambers
1274 Agvik Street
Barrow

Refreshments will be provided.

dot.alaska.gov/nreg/barrowmp

BRITNEY THOMPSON
NOTARY PUBLIC
STATE OF ALASKA
My Commission Expires May 18, 2015

C-101

The Arctic Sounder

REMIT TO: Alaska Media, LLC
P.O. Box 241582
Anchorage, AK 99524
Ph: (907) 770-0836
Fax: (907) 770-0822

CASE/PO/AIO: Brooks + Associates
AD# or identifier: AKSAS Proj. #61974 Public Meeting for Barrow Airport December 4, 2013
INVOICE(S): 7052

AFFIDAVIT OF PUBLICATION

UNITED STATES OF AMERICA	ATTACH PROOF OF PUBLICATION HERE
STATE OF ALASKA, THIRD DISTRICT BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC, THIS DAY PERSONALLY APPEARED **Mark Allred** WHO, BEING FIRST DULY SWORN, ACCORDING TO LAW, SAYS THAT HE IS **General Manager** OF **The Arctic Sounder** PUBLISHED AT **500 W International Airport Rd, Ste F, Anchorage, AK**, IN SAID THIRD DISTRICT AND STATE OF ALASKA AND THAT THE ADVERTISEMENT, OF WHICH THE ANNEXED OR ATTACHED IS A TRUE COPY, WHICH WAS PUBLISHED IN SAID PUBLICATION 11/21/13 AND THEREAFTER FOR A TOTAL OF 1 CONSECUTIVE ISSUE(S), THE LAST PUBLICATION APPEARING ON 11/21/13.	
Mark Allred MARK ALLRED GENERAL MANAGER SUBSCRIBED AND SWORN BEFORE ME THIS 25th day of November 20 13	
Kathleen L Seward KATHLEEN L SEWARD NOTARY PUBLIC STATE OF ALASKA MY COMMISSION EXPIRES ON STATE OF ALASKA NOTARY PUBLIC Kathleen L. Seward My Commission Expires Feb 1, 2017	

HELP WANTED

Access Alaska - Fairbanks, an agency promoting the independence of Alaskans who experience disabilities and seniors is seeking a resourceful and energetic individual to fill a Part-Time position in Barrow. Duties include advocacy, independent living skills training, service coordination, information and referral and equipment loans. Resumes may be emailed to dnelson@accessalaska.net or faxed to 907-474-4052, ATTN: DONNA.

Barrow Airport Master Plan Update

AKSAS Project No. 61974

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dot.alaska.gov/nreg/barrowmp

PUBLIC NOTICE
CGGLand, Inc. West Canning Seismic Program

The Alaska Department of Natural Resources (ADNR), Division of Oil and Gas (DO&G), has received a Geophysical Exploration Permit application from CGG Land, Inc. (CGG) for the West Canning Seismic Program. DO&G is providing public notice and an opportunity to comment under 11 AAC 96.030 (c).

Applicant: CGG Land, Inc., 2450 Cinnabar Loop, Anchorage, Alaska 99507
Contact: Wm. "Randy" Reed, 907-276-6037
Project ID: MLUPNS 13-009 West Canning 3D
Location: Umiat Meridian, Township 7-10N, Range 19-24E
Project Description: CGG plans to acquire a 3D seismic program on the North Slope Borough this winter 2014. The proposed program would be named the West Canning 3D Winter Seismic Program and acquired on State land. CGG will be mobilizing its equipment from the CGG Deadhorse location and will be transporting the Camp "cat train" to the project area along the existing roadways where ever possible before mobilizing onto the tundra for cross country travel. Tundra travel will only begin when approved by the Alaska Dept. of Natural Resources. Accessing options for the program are outlined in the Plan of Operations.

Seismic operations will be conducted utilizing tracked vibrators supported by tracked cable trucks and Tucker SnoCats. Receiver (i.e., geophone) lines will be spaced at pre-determined intervals with a group of 3 geophones spaced incrementally along the line to receive a response from the subsurface. Twenty to twenty six receiver lines may be placed on the ground at any one time.

Vibrator weight (~82,000 lbs.) is displaced by rubber-tracks with an equivalent footprint of 15 lbs. per square inch of pressure. Vibrator lines (source lines) will run east to west within the program area. Source lines will be spaced approximately 550 ft. apart; and the vibroseis points will be acquired every 50 ft. along the line.

The source is a standard vibroseis with a frequency of approximately 4 to 100 Hz; and the anticipated duration is 8-12 seconds for each sweep. The duration and decibel level of the source would vary depending on factors such as terrain and weather conditions.

The application package is available for review at the Division of Oil and Gas, 550 West 7th Avenue, Suite 800, Anchorage, Alaska 99501 or online at http://www.dog.dnr.alaska.gov/Permitting/Permitting.htm#permittingnotices.
Please send comments to DO&G by e-mail to dog.permitting@alaska.gov, or by regular mail to the DO&G address above. All comments must be in writing. A copy of the final decision will be sent to any person who provides written comments. Only persons who comment in writing during the public comment period will be eligible to file an administrative appeal or to request reconsideration of the final decision (11 AAC 02).

<u>All comments must be received by the Comment Deadline: 4:30 pm, Alaska Standard Time, December 16, 2013.</u>

The ADNR complies with Title II of the Americans with Disabilities Act of 1990. Individuals with disabilities who may need auxiliary aids, services, or special modifications to participate may contact the number TTY 907-269-8411 or address above.

Posted: 11/14/2013 — 14G-10-046

AFFIDAVIT OF PUBLICATION

UNITED STATES OF AMERICA
STATE OF ALASKA } **SS.**
FOURTH DISTRICT

Before me, the undersigned, a notary public, this day personally appeared Jennifer Robinson **who, being first duly sworn, according to law, says that he/she is an Advertising Clerk of the Fairbanks Daily News-Miner, a newspaper (i) published in newspaper format, (ii) distributed daily more than 50 weeks per year, (iii) with a total circulation of more than 500 and more than 10% of the population of the Fourth Judicial District, (iv) holding a second class mailing permit from the United States Postal Service, (v) not published primarily to distribute advertising, and (vi) not intended for a particular professional or occupational group. The advertisement which is attached is a true copy of the advertisement published in said paper on the following day(s):**

11/20/13	
Brooks & Associates	
8 i	
Ref 3925.09	
Acct# 101153	Ad# 40416433

and that the rate charged thereon is not excess of the rate charged private individuals, with the usual discounts.

Jennifer Robinson

Subscribed and sworn to before me on this 23 **day of** January **, 20**14

Notary Public in and for the State Alaska.

My commission expires April 7, 2017

Barrow Airport
Master Plan Update
AKSAS Project No. 61974

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Phone: 1-866-535-1877
E-mail: mycomments@brooks-alaska.com

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Public Meeting
Wednesday December 4, 2013
6-8 pm
Team Presentation begins at 6:15 pm
North Slope Borough Assembly Chambers
1274 Agvik Street
Barrow

Refreshments will be provided.

dot.alaska.gov/nreg/barrowmp

BRIAN NAPLACHOWSKI
NOTARY PUBLIC
April 7, 2017
STATE OF ALASKA

C-104

Dorothy Edwardsen <Dorothy.Edwardsen@north-slope.org> December 3, 2013 8:34 AM
To: "mycomments@brooks-alaska.com" <mycomments@brooks-alaska.com>
RE: Reminder: Barrow Airport Master Plan Update - Open House, December 4

4 Attachments, 2 KB

You know that Wednesday evening meetings are usually shunned by our elders of the community? It's a family night in most of our churches.

D

From: Anne Brooks [mailto:anne@brooks-alaska.ccsend.com] **On Behalf Of** Anne Brooks
Sent: Tuesday, December 03, 2013 8:00 AM
To: Dorothy Edwardsen
Subject: Reminder: Barrow Airport Master Plan Update - Open House, December 4

Barrow Airport Master Plan Update

AKSAS Project No. 61974

Public Open House

When: Wednesday, December 4th, 2013

Where: North Slope Borough Assembly Chambers

1274 Agvik St, Barrow

Time: Stop by any time between 6 and 8 p.m.

Presentation at 6:15 p.m.

Refreshments will be provided

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Forward email

Donna <djgardino@gmail.com> December 3, 2013 11:17 AM
To: Public Comments
Re: Looking for the draft master plan

Barrow. Thanks.

Sent from my iPhone

> On Dec 3, 2013, at 9:36 AM, Public Comments <mycomments@brooks-alaska.com> wrote:
>
> Donna == which draft master plan? I think the Barrow AMP should have been uploaded yesterday. We will check to see why it isn't available. If it is another one, let me know which one and I'll chase it down.
>
> Anne
>
> On Dec 3, 2013, at 8:27 AM, Donna Gardino <djgardino@gmail.com> wrote:
>
> Hi Anne,
>
> Bill and I are on a plane and he was looking to review the document. Did not see it on the website. Can you help? Thanks.
>
> Cheers,
> Donna
>
> Sent from my iPad

"Nelson, Lars" <Lars.Nelson@UICUmiaq.com> December 3, 2013 8:43 AM
To: "mycomments@brooks-alaska.com" <mycomments@brooks-alaska.com>
Cc: "anne@brooks-alaska.ccsend.com" <anne@brooks-alaska.ccsend.com>
FW: Reminder: Barrow Airport Master Plan Update - Open House, December 4

Good Morning,

I was hoping to review the draft document you say would be available in the email below. I am having trouble locating the draft via the link cited. I notice a "coming soon" spot, but that's it. Is the draft available?

LARS NELSON
BARROW OFFICE MANAGER | **UMIAQ**
DIRECT (907)852-7440 CELL (907)242-1612
A Member of the Ukpeagvik Iñupiat Corporation Family of Companies

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From: Anne Brooks [mailto:anne@brooks-alaska.ccsend.com] **On Behalf Of** Anne Brooks

Barrow Airport Master Plan Update

AKSAS Project No. 61974

Public Open House

When: Wednesday, December 4th, 2013

Where: North Slope Borough Assembly Chambers

1274 Agvik St, Barrow

Time: Stop by any time between 6 and 8 p.m.

Presentation at 6:15 p.m.

Refreshments will be provided

The Alaska Department of Transportation and Public Facilities (ADOT&PF) invites you to the final meeting for the Barrow Airport Master Plan Update. The update provides an overview of Barrow airport development and needs for the next 20 years.

The purpose of this meeting is to present the draft airport master plan for your review and listen to and record your comments. Comments will be addressed in the final document.

The draft document will be available for your review December 2nd on the project web site. http://dot.alaska.gov/nreg/barrowmp/documents.shtml

For additional information contact:
Public Involvement Coordinator
Anne Brooks
Brooks & Associates
Toll free: 1-907-535-1877
Email: mycomments@brooks-alaska.com

The ADOT&PF operates Federal Programs without regard to race, color, national origin, sex, age, or disability. Full Title VI Nondiscrimination Policy: dot.alaska.gov/tvi_statement.shtml. To file a complaint go to: dot.alaska.gov/cvlrts/titlevi.shtml.

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Forward email

Camden Yehle <camden.brooksalaska@gmail.com>

Reminder: Barrow Airport Master Plan Update - Open House, December 4

1 message

Anne Brooks <anne.brooksalaska@gmail.com>
Reply-To: mycomments@brooks-alaska.com
To: camden@brooks-alaska.com

Tue, Dec 3, 2013 at 8:00 AM

Barrow Airport Master Plan Update

AKSAS Project No. 61974

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Brooks and Associates | 1704 Rogers Park Court | Anchorage | AK | 99508

Barrow Airport Master Plan Update

Project No. 61974/3-02-0026-013-2012

MEETING NOTES

SUBJECT:	Barrow Airport Master Plan Update
PROJECT NO.:	61974/3-02-0026-013-2012
GROUP:	Public
DATE:	Wednesday, December 4, 2013
TIME:	6 pm to 8 pm
LOCATION:	North Slope Borough Assembly Chambers
MEETING OUTREACH:	See Table 1. Meeting Outreach
MEETING ATTENDANCE:	28 people signed in
MEETING MATERIALS:	Comment sheets, fact sheet, sign-in sheet, PowerPoint presentation, draft master plan
STAFF PRESENT:	*ADOT&PF*: Jeff Roach, Albert Beck, Paul Karczmarczyk
	PDC Engineers: Patrick Cotter, Royce Conlon
	Brooks & Associates: Camden Yehle

MEETING INFORMATION:

Attendees were greeted at the door, asked to sign-in, and briefed on the meeting format. Patrick Cotter with PDC Engineers made a presentation at the beginning of the meeting and answered questions throughout. Previous key comments were addressed with a question and answer board that outlined the benefits and challenges of each common comment or component of the master plan update. The board is available on line at http://dot.alaska.gov/nreg/barrowmp/documents.shtml.

The team received no written comments at the meeting.

The following verbal comments, questions and the team's responses were captured by project team at the meeting and are sorted by topic. The comments and questions are in regular type, with the team responses in *italics.*

Lease lots:

- Would it be possible for leaseholders to expand their lease lots? *Yes that will be a possibility. By moving the building restriction line to the south, the lease lots could be expanded. Jeff Roach (ADOT&PF) said leaseholders could also move to a different lease lot if they wanted.*
- Have the leaseholders been part of the conversation? *Yes, leaseholders have been very involved in the process.*
- How are the lease lots awarded? *Lease lots are leased through a competitive bidding process when lots become available.*
- When would the new lease lots be available for lease? *Jeff Roach said that depended on how the funding works out. Any lease lots on the south side would not be available until the south side taxiway and apron are constructed.*

- Would it be safe to say that new lease lots would not be available for five to six years? *Yes, that is how we see the lease lot availability moving forward in the implementation plan.*

Draft master plan document:

- Is the draft master plan online? *Yes, but you might need to refresh the webpage to view the document.*

Development and funding of the projects in the master plan:

- Does ADOT&PF already own the land inside the boundary? *Yes, the improvements stay inside the Barrow Airport boundary.*
- What is the likelihood of these projects going forward? *Jeff indicated that generally the short term projects are the most likely to be developed and medium term projects are the next most likely to go forward. The next master plan update would reevaluate the long-term projects.*
- How healthy is the federal funding source? *Jeff stated that the State of Alaska currently receives $200 million per year for non-international airports from the FAA. The amount is up to Congress and must be voted upon annually by Congress. The airport funding is spread amongst many airports in Alaska.*
- Is there a process of how the projects are picked for federal funding? *Yes, there is a very specific process that involves a scoring process by the Aviation Project Evaluation Board. It uses an evaluation system that scores all projects statewide and that score determines which projects will receive funding.*
- How often does the board meet? *Once per year.*
- Who are the members of the board? *The board is made up of high-level members of the ADOT&PF. There are six members and they are chosen by their position.*

Access to the south of the airport:

- Several commenters were concerned about access around the west end of the airport. *Even though the road is not where it was platted, the road is considered a public use road and the improvements outlined in the master plan won't limit access to the road or the south side of the airport. ADOT&PF is looking at the possibility of replatting the right of way to match the existing road.*
- Can the airport work with Ukpeaġvik Iñupiat Corporation (UIC) so both entities can use the road that is planned for the east leg of the "T" to the south of the airport? *Because it is not there yet, nor is it platted, it could not be included in the master plan update.*
- I would like to see guaranteed public access to the south side of the airport. *The project team knows that there is concern about access to the south side for subsistence activities and the road on the west end will remain. There will need to be some fencing to keep folks off the runway and the south side lease lots, but ADOT&PF does not intend to block access.*

- Is there a way to improve the area near the road "T" for subsistence use? Possibly developing places to pull off the road. *This road is off airport property so it is not included in the plan, but it is a good idea.*

Ahkovak Street:

- Is Ahkovak Street a platted right of way? *No, it is road inside of the airport property itself. The North Slope Borough maintains it through a maintenance agreement with ADOT&PF.*
- Is moving Ahkovak Street definitely happening? *Moving Ahkovak Street is shown at the end of the planning period (the 10 to 20 year range). There would likely be another Airport Master Plan Update that would occur in 10+ years. The need to move Ahkovak Street would be reevaluated at that time.*

Material sites and gravel resources:

- Are the material sites named in the master plan update? No, although we *are aware that material is a valuable commodity and that source locations are important. However, material sites are not usually named for specific projects in master plan updates. Usually a contractor will find material sites for specific jobs, or ADOT&PF will specify them at the time the construction project is in development.*
- Does the material have to come from a state source, or can it come from any source? *Material can come from any source.*
- It would be good for ADOT&PF to work with the borough and UIC for obtaining materials. At some point in the execution of the plan the gravel sites will need to be identified. When will those conversations begin? *There is a process that ADOT&PF goes through to score individual projects against all other projects in the state, and those that show a local match, such as providing gravel, score higher. If a part of the master plan was chosen to go forward, the project would be bid out and gravel sites would be determined at that time.*
- Not making arrangements and negotiations with other organizations for materials would be like going camping with only gas for one way. *The project team has been working with a technical advisory group to address some of those issues.*
- Barrow has many needs for gravel and gravel is a limited supply. Please keep this in mind when designing these improvements. *Jeff Roach indicated that ADOT&PF understands this.*

Local hire rules:

- All of this construction will need many workers, how can we do everything we can to hire local people? *Jeff says that the local hire rules will depend on where funding comes from. If the project is state funded, the state local hire rules must be followed, and with federal funding, federal rules would apply. There is a chapter in the master plan that addresses workforce development.*
- The state's local hire rules only apply to hiring Alaskans, what we would like is regional hire. *Local or regional hire rules are beyond what we can address in the master plan.*

Building restriction line (BRL) relocation:

- Is there is a reason that the building restriction line is not being moved until Phase III? *There are two main projects that need to happen first. The apron needs to be expanded and the north side parallel taxiway needs to be built.*
- The building restriction line was 110 feet to the south in the earlier alternatives, is that still the case? *Yes, but could be up to 150 feet and could be moved incrementally. It is a bit further from the center of the runway now than is standard because the runway has shifted south. The current apron in the limiting factor. Moving the building restriction line the full distance depends on the construction of the taxiway in Phase III.*
- There is a crack in the existing pavement with water running under it and if the building restriction line isn't moved that is exactly where we will have to build our expansion. Our improvements are planned for two years from now and the plan update doesn't show the building restriction line being moved for ten years. *There are issues with erosion and that could be a candidate for Maintenance and Operations project. Keep in mind that the tenant is responsible for maintaining the pavement within the lease lot boundary.*

Cultural resources:

- Does the master plan show that there are burial sites off the southwest corner of the runway? *The environmental part of the master plan states that detailed cultural resource surveys will be necessary before any changes are made to the south side.*

Access to the northeast corner of the airport:

- Would there be access through the fence to the lease lot on the northeast corner? *Yes, access to the lease lot would be provided through the security fence.*

Wastewater management:

- What is ADOT&PF going to do about keeping deicing chemicals out of the freshwater lagoon? *Development of a wastewater management plan is included in the near term plan.*

Other concerns:

- What happened to the alternative analysis? *The alternatives analysis was done after the August public meeting. The preferred alternatives that are in the master plan update include the comments heard up to this point.*
- Who is responsible to remove the old gas line? The responsible party for the old gas line is a federal agency. ADOT&PF is a state agency. *We are not aware of any plans to dismantle the gas line.*
- Are there emergency plans in case there was a plane crash? *The airport maintenance and operations has emergency response equipment, training, and response plans. There are existing agreements between airport staff and local emergency responders.*
- Is there an opportunity for joint emergency training between the airport and the city and borough? *Funding for that would have to be arranged with the ADOT&PF Maintenance and Operations section.*

- How are you going to keep animals off of the runway? *There is a wildlife management plan project that is currently underway to address this.*
- Can a Boeing 737-800 aircraft land here? *Yes, we flew in on one today. This aircraft will be the design aircraft in the next five years. The design aircraft is the most demanding aircraft that lands and takes off here at least 250 times per year (500 total operations per year). Currently that design aircraft is the Boeing 737-700.*
- Are there going to be changes made to instrumentation at the flight service station? *The team has discussed this with the flight service station and there are no planned changes to instrumentation.*

Email comments received prior to and immediately after the meeting:

- You know that Wednesday evening meetings are usually shunned by our elders of the community? It's a family night in most of our churches.
- Two people sent messages about where to find the draft master plan online.

Table 1. Meeting Outreach

Date	Outreach method	Description
11/15/2013	Notice on the project website	Inviting the public to the meeting
11/18/2013	Postcard mailer	Inviting the public to the meeting
11/18/2013	Public service announcement request sent to GCI, KBRW-FM, and KBRW-AM	Sent with request to broadcast announcement inviting public to meeting.
11/19/2013 12/03/2013	Constant Contact email and reminder	Provide email invitation to the meeting to project stakeholders
11/20/2013	State of Alaska Online Notice	Inviting the public to the public meeting
11/20/2013	Display advertising in *Fairbanks Daily News Miner*	Inviting the public to the meeting
11/21/2013	Display advertising in *Anchorage Daily News*	Inviting the public to the meeting
11/21/2013	Display advertising in *Arctic Sounder*	Inviting the public to the meeting

Related documents on file:

Comment Sheet
Display Advertising
Fact Sheet
Mailing List
Postcard Mailer
PowerPoint Presentation
Sign in Sheets
Draft Master Plan

PUBLIC SERVICE ANNOUNCEMENT – BARROW AIRPORT MASTER PLAN UPDATE

30 SECOND SPOT

THE ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES INVITES YOU TO THE FINAL MEETING FOR THE BARROW AIRPORT MASTER PLAN UPDATE THAT PROVIDES AN OVERVIEW OF BARROW AIRPORT DEVELOPMENT FOR THE NEXT 20 YEARS. THE TEAM WILL PRESENT THE DRAFT AIRPORT MASTER PLAN FOR YOUR REVIEW AND LISTEN TO AND RECORD YOUR COMMENTS. THE MEETING IS WEDNESDAY, DECEMBER 4, FROM 6 TO 8 P.M. AT THE NORTH SLOPE BOROUGH ASSEMBLY CHAMBERS, IN BARROW. THE DRAFT DOCUMENT WILL BE AVAILABLE FOR YOUR REVIEW DECEMBER 2ND ON THE PROJECT WEBSITE WHICH CAN BE FOUND BY SEARCHING FOR "BARROW AIRPORT MASTER PLAN UPDATE." FOR MORE INFORMATION CALL ANNE BROOKS TOLL FREE AT 866-535-1877.

####

For more information contact:

Anne Brooks, Public Involvement Coordinator
Toll Free Telephone: 1-866-535-1877
Email: mycomments@brooks-alaska.com

From: Tom Nicolos [mailto:Tom.Nicolos@north-slope.org]
Sent: Thursday, December 05, 2013 1:13 PM
To: Roach, Jeffery A (DOT)
Cc: Fred E. Parady; Morrie Lemen, Jr.; Reanne V. Heath
Subject: Barrow Airport Master Plan

Good morning Jeff,

I completed the Barrow Master Plan survey this morning so this will be a rehash of most of what I provide in the survey.

As we discussed I am still concerned regarding the preferred plan establishing a commercial lease lot adjacent to a residential subdivision on the northeast of the airport. I am equally concerned about relocating the transit parking to the new proposed location by the Flight Service Station.

As you are aware I currently serve on the Barrow Zoning Commission. Over the past three years I have listened to, and defended numerous public complaints regarding noise form the airport operating at its current levels. These complaints are more pronounced during the summer months when community member have their windows open. This is with the limited oil development support from mostly helicopter traffic that has occurred over the past couple of years. I would encourage you to limit the commercial development on the to areas that have a buffer such as the airport property on the north side of Ahkovak street or plan to ensure that an effective noise barrier is required. While today, the transit parking is nonexistent as the off shore developments progresses there is a high likelihood of 24-hour activity out to the transient parking area by both turbine airplanes and helicopters. I would also encourage you to be proactive on addressing noise pollution if transit parking does in fact end up against a residential subdivision.

Regards,

Tom D. Nicolos
NSB Airports Manager
City of Barrow Zoning Commission Member

Camden Yehle <camden.brooksalaska@gmail.com>

Barrow Airport Master Plan Update - Draft Document

1 message

Anne Brooks <anne.brooksalaska@gmail.com> Tue, Dec 17, 2013 at 9:38 AM
Reply-To: comments.brooksalaska@gmail.com
To: camden@brooks-alaska.com

Barrow Airport Master Plan Update

AKSAS Project No. 61974

Thanks to everyone who attended the Barrow Airport Master Plan Update public meeting on December 4, 2013. If you were unable to make it to the meeting, the project team is accepting comments by email, phone, and mail on the draft document until December 31, 2013. The digital version is available on the website at http://dot.alaska.gov/nreg/barrowmp/documents.shtml. Paper copies are at the North Slope Borough and the City of Barrow offices.

For additional information or to make a comment contact:
Anne Brooks, Public Involvement Coordinator
Brooks & Associates
1704 Rogers Park Court
Toll free: 1-907-535-1877
Email: comments.brooksalaska@gmail.com

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