Kotzebue Airport

Master Plan Update

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Prepared for

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ABBREVIATIONS AND ACRONYMS

AAC ..... Aircraft Approach Category *OR* Alaska Administrative Code
AASP ..... Alaska Aviation System Plan
AC. ..... [FAA] Advisory Circular
ACAIS ..... Air Carrier Activity "Information System
ACMP ..... Alaska Coastal Management Program
ADEC ..... State of Alaska Department of Environmental Conservation
ADF&G ..... State of Alaska Department of Fish and Game
ADG ..... Aircraft Design Group
ADOT&PF ..... State of Alaska Department of Transportation & Public Facilities
AHRS ..... Alaska Historic Resource Survey
AIDEA ..... Alaska Industrial Development and Export Authority
AIP ..... Airport Improvements Program
ALP ..... Airport Layout Plan
AMP ..... Airport Master Plan
ANCSA ..... Alaska Native Claims Settlement Act
APDES ..... Alaska Pollutant Discharge Elimination System
APEB ..... Aviation Project Evaluation Board
ARC ..... Airport Reference Code
ARFF ..... Aircraft Rescue and Firefighting Facility
ASOS ..... Automated Surface Observing System
ATO ..... Air Traffic Organization
BMP ..... Best Management Practice(s)
BRL ..... Building Restriction Line
CEDS ..... Comprehensive Economic Development Strategy
CFR ..... Code of Federal Regulations
CGP ..... Construction General Permit
CIP ..... Capital Improvements Program
CZMA ..... Coastal Zone Management Act
DCCED ... State of Alaska Department of Commerce, Community, and Economic Development
DCRA .... Division of Community and Regional Affairs
DF ..... Direction Finder
DME ..... Distance Measuring Equipment
DOL&WD ..... State of Alaska Department of Labor and Workforce Development
EA ..... Environmental Assessment
EAS ..... Essential Air Service
EDA ..... Economic Development Administration
EFH ..... Essential Fish Habitat
EPA ..... U.S. Environmental Protection Agency
FAA ..... Federal Aviation Administration
FAR ..... Federal Aviation Regulation
FIRM ..... Flood Insurance Rate Map
FONSI ..... Finding of No Significant Impact
FSS. ..... Flight Service Station
ft ..... foot/feet
GA. ..... General Aviation
GO Bond ..... General Obligation Bond
HIRL ..... High Intensity Runway Lighting
IATA ..... International Air Transport Association
ILS ..... Instrument Landing System
IRA ..... Indian Reorganization Act
ITA ..... Individual Training Account
KEA ..... Kotzebue Electric Association
KIC ..... Kikiktagruk Iñupiat Corporation
kt ..... knot(s)
M&O ..... maintenance and operations
MIRL ..... Medium Intensity Runway Lighting
MOA ..... Memorandum of Agreement
mph ..... miles per hour
NAC ..... Northern Air Cargo
navaid ..... navigational aid
NDB ..... Non-Directional Radio Homing Beacon
NDC ..... NANA Development Corporation
NEPA ..... National Environmental Policy Act
NHPA ..... National Historic Preservation Act
NMFS ..... National Marine Fisheries Service
NOAA ..... National Oceanic and Atmospheric Administration
NPIAS .. National Plan of Integrated Airport Systems
NRHP ..... National Register of Historic Places
NWAB ..... Northwest Arctic Borough
NWS ..... National Weather Service
OHA ..... Office of History and Archaeology
OHWM ..... Ordinary High Water Mark
OTZ ..... Ralph Wien Memorial (Kotzebue) Airport
PAPI ..... Precision Approach Path Indicators
PCI ..... Pavement Condition Index

PDC ..... PDC Inc. Engineers
PFC ..... Passenger Facility Charge
RDC ..... Runway Design Code
REIL ..... Runway End Identification Lights
RITA ..... Research and Innovative Technology Administration
ROFA ..... Runway Obstacle Free Area
ROFZ ..... Runway Obstacle Free Zone
RPZ ..... Runway Protection Zone
RSA ..... Runway Safety Area
RVR ..... Runway Visual Range
sf ..... square foot/feet
SHPO ..... State Historic Preservation Office(r)
SIDA ..... Secure Identification and Display Areas
SREB ..... Snow Removal Equipment Building
STEM ..... Science, Technology, Engineering, and Mathematics
STEP ..... State Training and Employment Program
SWPPP ..... Storm Water Pollution Prevention Plan
TAF ..... Terminal Area Forecast
TAR ..... Total Area Ratio
TDG ..... Taxiway Design Group
THPO ..... Tribal Historic Preservation Office(r)
TSA ..... Transportation Security Administration
TVEP ..... Technical Vocational Education Program
UAF ..... University of Alaska Fairbanks
USACE ..... U.S. Army Corps of Engineers
USDA ..... U.S. Department of Agriculture
USDOT ..... U.S. Department of Transportation
USFWS ..... U.S. Fish and Wildlife Service
USPS ..... U.S. Postal Service
VASI ..... Visual Approach Slope Indicators
VGSI ..... Visual Guidance Slope Indicators
VHF ..... Very High Frequency
VOR ..... VHR Omnidirectional Range
WIA ..... Workforce Investment Act

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Executive Summary

The Kotzebue Airport Master Plan Update is a comprehensive study of the Ralph Wien Memorial Airport (OTZ) in Kotzebue, Alaska, including an inventory of existing conditions, forecasts of aviation demand, and assessment of facility requirements. The plan outlines development for the short (5-year), medium (10-year), and long (20-year) terms, and provides the framework to guide future airport development.

This airport master plan is an update to the previous master plan completed in 1998. It also builds on data collected by the 2008 *Kotzebue Airport Relocation Feasibility Study* and the 2012 Runway Safety Area Environmental Assessment. The first Kotzebue Airport planning document was the *Terminal Area/Land Use Plan*, completed in 1983.

Background

Ralph Wien Memorial Airport is a state-owned, public-use airport that functions as a critical element of the transportation system of the Northwest Arctic Borough. It provides regularly scheduled passenger and cargo air service to communities throughout the region, as well as the only regional connection to Ted Stevens Anchorage International Airport. The airport facilities have received considerable investment in recent years, including extensive construction to upgrade the Runway Safety Areas.

Facilities

Future development at OTZ was planned by translating the aviation demand forecasts into the specific type and quantity of facilities necessary to fulfill the needs of the airport. Key recommendations for facility improvements include apron expansion, new taxiway geometry, and relocation of tie-downs.

Several alternative development options were developed and analyzed (Chapter 5). Evaluation criteria included fiscal, environmental, and engineering factors. Ultimately, a preferred alternative was selected that meets the needs of the ADOT&PF, airport users, and the traveling public, while balancing the need for fiscal constraint and environmental protection.

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 1 - Implementation Plan

	Project Description	Total Estimated Cost
Phase I: 2016-2021		
I-1	Sand Storage Expansion	$ 2.9 million
I-2	Northeast Apron Development	$ 8.7 million
I-3	Apron Reconstruction and Paving	$23.7 million
	Phase I Total	**$35.3 million**
Phase II: 2021-2026		
II-1	Short-Term Parking Improvements	$1.2 million
II-2	Tie-Down Relocation Ph. 1	$5.4 million
II-3	Master Plan Update and ALP	$0.5 million
	Phase II Total	**$7.1 million**
Phase III: 2026-2036		
III-1	Tie-Down Relocation Ph. 2	$3.6 million
III-2	Taxiway E Relocation	$3.3 million
III-3	Taxiway J Construction	$6.9 million
	Phase III Total	**$13.8 million**

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.

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

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 it 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 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.

1.2 Issues the Kotzebue Airport Master Plan Addresses

Relevant issues were identified during the initial phase of the project. Methods used included discussions with the airport users including air taxi and commercial operators, lease lot owners, as well as Kotzebue businesses and residents; additionally, site inspections were conducted and previous airport studies reviewed. Comments came primarily through personal telephone conversations, e-mail correspondence, and public meetings. Chapter 8 contains a summary of the public involvement program.

The issues addressed at Kotzebue Airport (OTZ) include:

- Need for additional leasing opportunities
- Non-standard conditions:
  - Tie-downs too close to Runway 18-36
  - Taxiway E falls within middle third of Runway 9-27
  - Taxiway F extends from the end of Runway 18-36
- Failing apron pavement

1.3 Kotzebue

The city of Kotzebue, population 3,201, is located on the northern tip of the Baldwin Peninsula in northwest Alaska. It is the regional hub and seat of government for the Northwest Arctic Borough (NWAB) and serves as the corporate headquarters for the NANA Regional Corporation. Composed of 11 communities with over 7,500 people, the NWAB covers 39,000 square miles. See Section 2.2 for a complete description of the region.

1.4 Kotzebue Airport Timeline

Kotzebue Airport has been in use for over 60 years. During that time it has seen significant changes, as the timeline on the next page shows.

Territory of Alaska builds Ralph Wien Memorial Airport **1950**

Taxiway, apron, and access road constructed **1957**

Kotzebue City Field closed **1958**

Lighting systems extended and apron expanded **1961**

RW 9-27 extended 1,300 feet eastward **1963**

First passenger terminal constructed **1965**

Additional land acquisition, VASI relocation, installation of segmented circle **1973**

Congress passes ANILCA; several new federal parks created in Northwest Alaska **1980**

Land acquired north of the terminal area **1982**

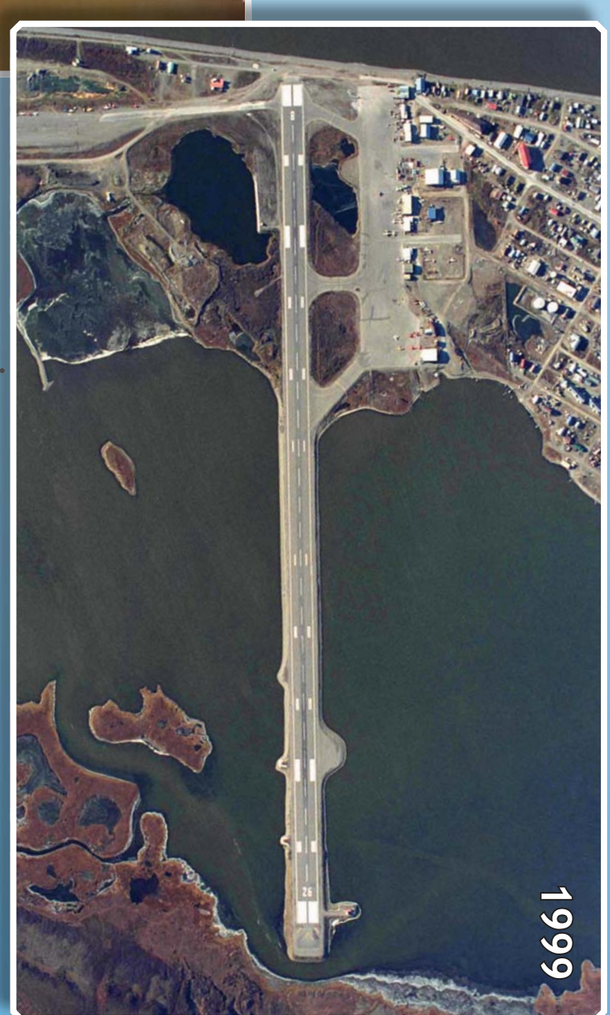
Apron paved; TW E constructed; terminal area and land use plan completed **1983**

MarkAir begins service to Kotzebue **1984**

Northwest Arctic Borough incorporated **1986**

Construction of Red Dog Mine begins; TW A and B and new access roads constructed **1987**

Airport master plan updated **1989**



Construction of new ARFF/SREB facility begins **2003**

Airport relocation study completed **2008**

RW 9-27 safety area expansion begins **2013**

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2 Existing Conditions and Issues

The first step in the airport master planning process is to gather information about the airport and surrounding environment. This information comes from a variety of sources and provides a starting point for evaluation of airport deficiencies and areas of potential development.

This chapter presents:

- The airport's general setting and role in the community, region, and state
- An overview of the airspace, including navigational aids and procedures
- Description of current airport facilities and services
- A summary of the environmental conditions at the airport

2.1 Issues

The Kotzebue Ralph Wien Memorial Airport (OTZ) has been the subject of considerable study over the past several years, including the idea of relocating the airport. The final airport relocation feasibility study, released in 2008, concluded that relocation was not feasible due to funding constraints. Subsequently, the Alaska Department of Transportation & Public Facilities (ADOT&PF) moved forward with expanding the Runway Safety Areas (RSAs), conducting a practicability study in 2010. In 2012 the final environmental assessment (EA) for expanding the RSAs was approved, and construction began in 2013.

During the initial phase of this master plan update, the following issues were raised through discussions with airport users, the Federal Aviation Administration (FAA), and ADOT&PF:

- Need for a float pond with public access
- Lease lot demand
- Property acquisition
- Security of general aviation (GA) aircraft
- Offset instrument landing system (ILS) for Runway 9/27
- Security, including fencing and gates, and transient pilots' access to the apron
- Desire for intervisibility between the main and crosswind runways
- Erosion of the hillside across from the Runway 27 threshold

2.1.1 Constraints on Development

There are considerable barriers to implementing a fully FAA-compliant airport at Kotzebue that accommodates the design aircraft under all weather conditions. Previous studies have analyzed these constraints.

Physical Constraints

The primary constraint to development at OTZ is the location of the airport. The runway is bounded by the Kotzebue Sound on the west end and Kotzebue Lagoon (into which it extends) on the east and south. The community is adjacent to the airport on the north side.

Because the airport effectively serves as the southern boundary of the community, there have been considerable accommodations to allow vehicle access around the west end of the airport for residents to access traditional fish camps south of the airport. The community and ADOT&PF went through a lengthy process of meetings and design alternatives and settled on the current solution: extension into Kotzebue Sound with a vehicle access road around the end of the extension. Pilot-activated electronic gates across this access road prevent vehicles from entering the RSA during final approaches by aircraft. Due to the direct effects on fisheries and the community, an Environmental Impact Statement (EIS) was considered, but ultimately it was determined that an EA would suffice (Section 2.9.11 summarizes the EA). Residents were concerned that any construction in Kotzebue Sound would disrupt the longshore channel that is important to boating and subsistence activities.

The RSA practicability study (USKH, 2010) examined a number of options for bringing the airport into full compliance with FAA RSA standards (500 feet wide, 1,000 feet long). Collaboration between the FAA Flight Standards office, ADOT&PF, and the community led to the decision to extend the runway further into Kotzebue Sound. A summary of this study is included in Section 2.9.7. The following table outlines the RSA deficiencies that could not be corrected.

Table 2-1 – Summary of RSA Constraints

Deficiency	Reason	Implication(s)	Study
RSA Width = 340'	Not practicable to widen	RSA is 160' too narrow	RSA EA, pg. 9
RSA Length = 400' on each end	Not practicable to lengthen	RSA is 600' too short on each end	RSA EA, pg. 9
Runway Length = 5,900'	Not practicable to lengthen	Runway does not accommodate fully-loaded 737-400/-800 during contaminated runway conditions	RSA EA, pg. 41

Financial Constraints

Considerable effort was put into evaluating the possibility of relocating the airport. Ultimately, the cost of relocating the airport was deemed too great.

The major financial hurdle facing most airport development projects at Kotzebue, particularly relocation, is the cost of gravel. There are no reliable sources near the community, and material brought from elsewhere must be lightered ashore. The relocation study (PDC, 2008) examined a number of material sources and included a cost sensitivity analysis to determine if a particular price for gravel would make relocation financially feasible.

Environmental Constraints

The Baldwin Peninsula is covered in wetlands and underlain with permafrost—two features that make construction challenging and expensive. Section 2.8.13 summarizes the extent of wetlands around the airport.

Additionally, subsistence and commercial fishing activity occur along the shoreline south of the primary runway. Continued access to the shore has been an ongoing concern for the community, and maintaining that access has prevented expansion of the airport to fully meet FAA design guidance.

The presence of cultural resources on and around the airport has also prevented airport expansion (see Section 2.8.8). Since construction of the RSA began in 2013, there has been ongoing recovery of human remains on airport property. The remains are to be interred on Kikiktagruk Iñupiat Corporation (KIC) property within the airport boundary.

2.2 Background

2.2.1 Regional Setting

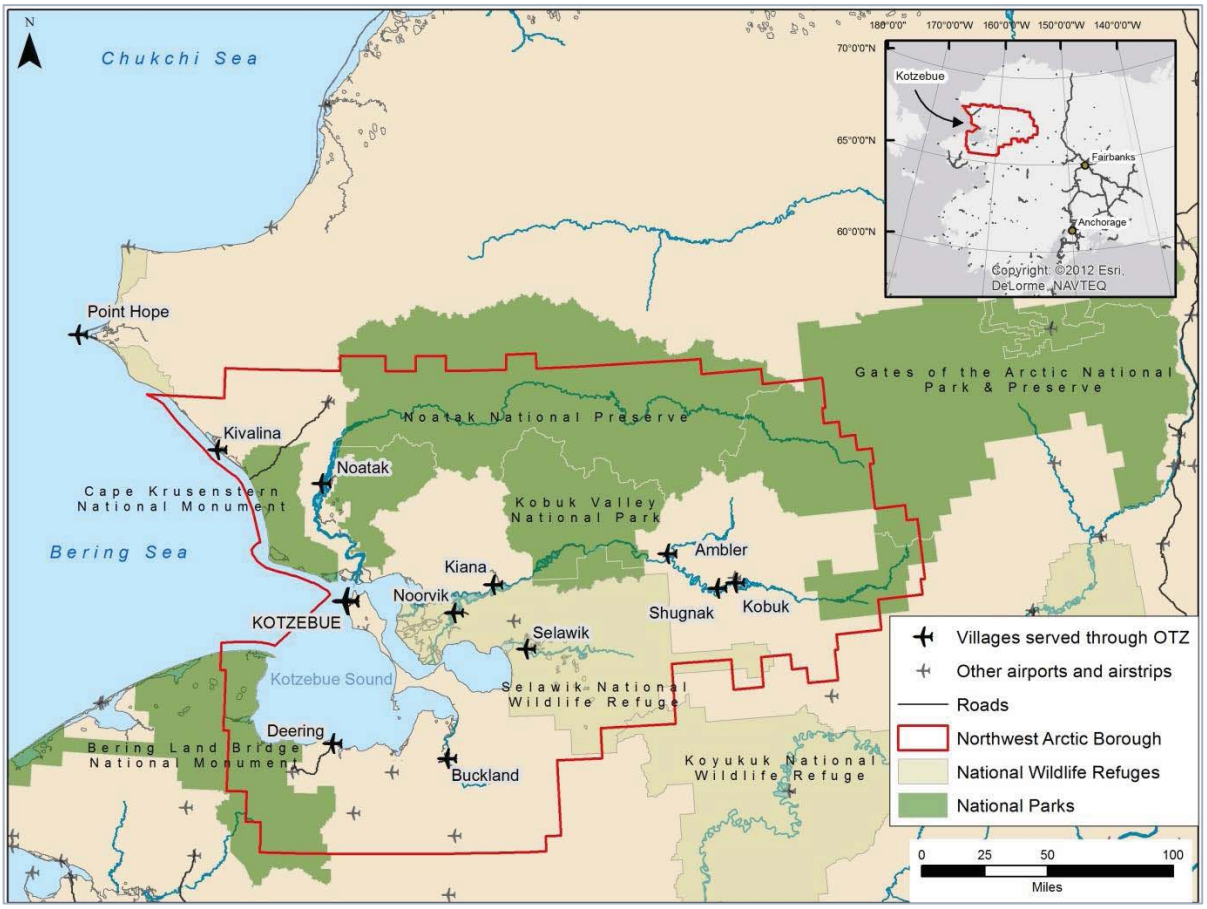

Figure 2-1 – Kotzebue Regional Setting

Located 549 miles northwest of Anchorage, Kotzebue is the largest of eleven communities in the 36,000-square-mile Northwest Arctic Borough (NWAB). The city occupies a 3-mile-long spit at the north end of the Baldwin Peninsula. The climate is transitional, characterized by cool summers and long, cold winters. Total precipitation averages only 9 inches per year, with an average snowfall of 40 inches.

The 2010 census identified 3,201 residents of Kotzebue and 7,523 residents throughout the NWAB. The most recent forecast of population growth in the NWAB was 0.8%.[1] More than 70% of Kotzebue residents are Alaska Native, predominantly Inupiat.

Figure 2-2 – Airport Property and Local Setting

2.2.2 Government

Kotzebue is the seat of government for the NWAB and home to NANA Regional Corporation. The City of Kotzebue is a second-class city with a city manager form of government. The village corporation established for Kotzebue under the Alaska Native Claims Settlement Act (ANCSA) is the Kikiktagruk Iñupiat Corporation (KIC). Maniilaq Association is the regional Native healthcare provider. The Kotzebue tribal council is the Kotzebue IRA Council.

[1] June 2014 issue of *Trends*, http://laborstats.alaska.gov/

2.2.3 Economy

Kotzebue's role as a regional hub provides the backbone of the community's economy. It is the regional center for the ten villages in the NWAB, providing services such as:

- Health care
- United States Postal Service (USPS) office
- Education (NWAB School District headquarters, tech center, and Chukchi Campus of the University of Alaska Fairbanks)

Education and health services, local government, and trade/transportation/utilities make up the three largest employment sectors in Kotzebue. Residents also rely on subsistence hunting, fishing, and gathering to supplement their income.

The Red Dog Mine is located north of Kotzebue, within the NWAB. The mine is the NWAB's sole taxpayer and provides the Borough 60% of its revenue. Additionally, it makes royalty payments to NANA. From 2005 to 2009, the mine paid $373 million in royalties to NANA (Red Dog Mine, 2009).

The City of Kotzebue collects a 6% sales tax, 6% bed tax, and 6% alcohol tax.

Tourism also provides economic opportunities for residents. Kotzebue serves as the jumping-off point for visitors heading to federal parkland units such as Cape Krusenstern National Monument, Noatak National Preserve, Kobuk Valley National Park, Selawik National Wildlife Refuge, and Bering Land Bridge National Preserve. In 2010, the National Park Service opened the Northwest Arctic Heritage Center in Kotzebue. Sport hunters and fisherman also travel through Kotzebue to pursue game species such as caribou, muskox, moose, and bear, as well as salmon and other sportfish.

2.2.4 Transportation

The Ralph Wien Memorial Airport (OTZ) serves as a primary transportation hub for the NWAB. There is daily passenger jet service to Anchorage and Nome as well as air taxi service to outlying villages. Cargo and mail destined for the villages is also routed through OTZ. Villages served through OTZ include Ambler, Deering, Selawik, Noorvik, Point Hope, Noatak, Kivalina, Kiana, Shugnak, Kobuk, and Buckland.

The FAA categorizes OTZ as a Non-Hub airport under the National Plan of Integrated Airport Systems (NPIAS). The NPIAS categorizes primary commercial service airports according to passenger enplanements using the following rubric:

> *Large hubs are those airports that each account for at least one percent of total US passenger enplanements; medium hubs for between 0.25 percent and one percent; small hubs for between 0.05 percent and 0.25 percent; and non-hubs for less than 0.05 percent of all enplanements, but more than 10,000 annual enplanements.*

The Alaska Aviation System Plan (AASP) classifies OTZ as a Regional airport. This is defined as:

> *...public use airports, heliports, or seaplane bases that serve as an economic or transportation hub for more than one community, indicated by having at least three of the following characteristics:*
>
> - *At least 10,000 annual passenger boardings*
> - *An air carrier hub*
> - *A postal hub or more than 2 million pounds of cargo handled annually*
> - *Scheduled passenger service in aircraft with at least 30 seats*
> - *Community has a health facility serving two or more communities*
> - *Primary or secondary fire tanker base*
> - *Community has a Coast Guard air station, air support facility, or forward operating station*

Due to its location on the coast, Kotzebue is a transfer point between ocean and inland shipping during the ice-free season (typically early July through early October). However, there are no deep-water port facilities near the community and goods must be lightered between deep-draft vessels and land. The ADOT&PF is currently evaluating a road connection to a potential deep-water port at Cape Blossom. A summary of this study is in Section 2.9.10. Two tugs and four barges are based in Kotzebue.

Within Kotzebue, there are 26 miles of local roads used by automobiles and ATVs. There are no aroad connections between Kotzebue and other communities, nor are there road connections between any of the other villages in the NWAB, although many of the villages are connected by winter trails. Every winter, ice roads are constructed from Kotzebue to Kobuk River villages to transport fuel, building materials, and supplies.

2.2.5 Climate

The Division of Community and Regional Affairs (DCRA) within the Alaska Department of Commerce, Community, and Economic Development (DCCED) summarizes the climate of Kotzebue as follows:

> *Kotzebue is located in the transitional climate zone, which is characterized by long, cold winters and cool summers. The average low temperature during January is -12°F; the average high during July is 58°F. Temperature extremes have been measured from -52 to 85°F. Annual snowfall averages 40 inches, with total precipitation of 9 inches per year. Kotzebue Sound is ice-free from early July until early October.*

2.3 Land Use

Land use within the City of Kotzebue is mixed, with residential, commercial, and recreational occurring throughout the City. The land surrounding OTZ and much of the Baldwin Peninsula is primarily owned by KIC and NANA.

Taxiway A
Taxiway B
Building Restriction Line
Parking Restriction Line
Taxilane
Taxiway C
Taxiway D
Taxiway E
Localizer Critical Area
6
27
Glide Slope Critical Area
Taxiway F
FAA Property
Kotzebue Lagoon
Building Restriction Line
N
Primary Runway

Second Avenue
Lake Street
Fifth Avenue
Third Avenue
Airport Boundary
Airport Access Road
Taxiway A
Taxiway B
Lot 3
Lot 4
Lot 5
Lot 1A
Block 3
Parcel S
Parcel L
Parcel O
Lot 5
Lot 5A
Kotzebue Lagoon
Lot AAA
Lot B
Lot CD
Lot EG
Lot HI
Block 1
Lot K1
Lot L
Lot M
Lot 1A
Lot 1B
Lot 2A
Lot 2B
Lot 3
Lot 4
Block 2
Lot 6A
Block 4
Lot 1
N
Terminal Area

Kotzebue Lagoon
Parcel I
Building Restriction Line
Air Force Road
18
36
Airport Boundary
Parcel E
KIC Property
N
Crosswind Runway

1. ARFF / SREB / FSS / NWS
2. M&O Storage
3. Sand Storage
4. FBX
5. Alaska Airlines Terminal
6. Bering Air Terminal
7. Ravn Terminal
8. Baker
9. Northwestern Aviation
10. Tie-downs
11. Guardian Flight
12. Seasonal Use Area
13. Lot 6A - Aircraft/Dock Area
14. Public Parking & Terminal Access
15. Transient Parking
16. National Guard (Lot 3)
17. Fish & Wildlife Service (Lot 1)
18. Float Plane Pond (Lot 6)

Lease Lots
Airport Boundary
Fence
BRL
Navaid Critical Areas
FAA Property

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Incompatible land uses include the City of Kotzebue sewage lagoon that is located at the south end of Runway 18/36, and the vehicle access road (Second Avenue) around the west end of Runway 9/27. Additionally, Air Force Road crosses Taxiway F. The property owned by KIC adjacent to Runway 18/36 (see Figure 2-3) contains seasonal fish camps and fish drying racks. Other seasonal fish camps are located on airport property along the beach south of the KIC property. Wind turbines owned and operated by Kotzebue Electric Association (KEA) are approximately 3.6 miles southeast of the airport.

The community landfill is approximately 1.4 miles south-southeast of the Runway 36 threshold and 2.4 miles south of the primary runway mid-point.

The community has expressed concerns that a portion of the Kotzebue cemetery is located on airport property (see Figure 2-2).

Table 2-2 below summarizes the current airport leaseholders and sub-lessees. All leases are currently used for aeronautical purposes.

Table 2-2 - Current Airport Leases and Sub-leases

Lessee	Block	Lot	Sub-lease (if any)
Alaska Airlines	1	EG	
Department of Military & Veterans Affairs	6	3	
Civil Air Patrol	1	L	
Baker Leasing	1 1	B[2] HI	
Bering Air	3 3	4 3	
City of Kotzebue		Parcel E Parcel M	
CPD Alaska, LLC	1	M	
Drake Investments	1	K1	Northwestern Aviation
FAA			
Frontier Flying Service	3	5	
JJM Inc.	3	1A	
FBX	1 2	CD 3	
Northwestern Aviation	2	4	Guardian Flight
Northern Air Trophy	2	2A	
Ram Aviation	2	1A	
U.S. Fish & Wildlife Service	6	1, 2, 6	
Federal Aviation Administration		Tract VIII	

[2] Ryan Air Inc. was formerly a sub-lessee of Baker Leasing, but was awarded possession of the Baker lease lot B on Block 1 in a court judgment. ADOT&PF has not yet issued consent to the assignment.

ADOT&PF is interested in acquiring the FAA and KIC properties south of the Runway 9 threshold (Tract VIII; see Figure 2-3) in order to deter future incompatible land uses. FAA is currently demolishing some structures and cleaning up their parcel.

2.4 Aviation Facilities

The following section describes the current airport facilities, including dimensions, non-standard conditions, and other deficiencies. The FAA outlines the standards and recommendations for airport features in Advisory Circular (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. 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."

2.4.1 Airfield/Airspace

The current Airport Reference Code (ARC) for Kotzebue Airport is C-III. 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 FAA 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 (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 airspace around OTZ is classified as Class E airspace. Tie-downs along Runway 18/36 are within the runway's primary surface. Transient aircraft parked in front of the ARFF/SREB may penetrate the transitional surface, depending on type of aircraft and where they park.

2.4.2 Runways

Runway 9/27

Runway 9/27 is the primary runway at OTZ. It is paved and lighted, with a precision instrument approach for Runway 9 and a non-precision approach for Runway 27.

Runway 9 has a straight-in ILS approach with visibility minimum of 4,000 feet Runway Visual Range (RVR). The decision altitude for this approach is 263 feet. Decision altitude is the lowest an aircraft is permitted to fly without the runway in sight.

There is also an Area Navigation (RNAV) global positioning system (GPS) approach for Runway 9 that reduces the decision altitude to 213 feet. All of the other minima are the same as the ILS approach. This GPS approach has the lowest published minimums for OTZ.

The Runway 9 VOR/DME approach has a decision altitude of 340 feet and a one-mile visibility minimum.

Runway 27 has an RNAV GPS approach with visibility minimums as low as 1¼ miles and two VOR/DME approaches with visibility minimums as low as one mile.

Runway 9/27 was recently resurfaced, and the 2013 pavement condition report indicates that the surface is in good condition and recommends only preventative maintenance. The surface is grooved along its full length and width.

Runway 18/36

Runway 18/36 is the crosswind runway, used primarily by air taxis and GA aircraft. It is lighted but does not have runway markings. The surface is gravel.

Table 2-3 – Runway Characteristics

Item	Runway 9/27	Runway 18/36
Length	5,900’	3,876’
Width	150’	90’
Surface	Asphalt	Gravel
RSA Width	340’	120’
RSA Length beyond End	400’	240’
Runway Object-Free Area Width	800’	500’
Runway Object-Free Area Length beyond End	1,000’	300’
Runway Obstacle-Free Zone Width	400’	400’
Runway Obstacle-Free Zone Length beyond End	200’	200’
Visibility Minimums	Runway 9: ≥3/4-mile Runway 27: ≥1 mile	Both: ≥1 mile

2.4.3 Taxiways

There are seven taxiways at OTZ. Table 2-4 summarizes their dimensions and functionality.

Table 2-4 – Taxiway Characteristics

Taxiway	Function	Surface	Width	Safety Area
"A" Alpha	Access from apron to Block 3 lease lots	Asphalt	50'	120'
"B" Bravo	Access from apron to Block 3 lease lots and north GA tie-downs	Asphalt	50'	120'
"C" Charlie	Runway 9/27 to apron access	Asphalt	75'	120'
"D" Delta	Runway 9/27 to apron access	Asphalt	90'	120'
"E" Echo	Runway 9/27 to apron access	Asphalt	90'	120'
"F" Foxtrot	Connection between runways	Asphalt	50'	100'
"G" Golf	Connection between Runway 18/36 and National Guard apron	Gravel	50'	100'

Taxiways C and F are being reconfigured under the current RSA project. Both taxiways will be shifted to the east and aligned to intersect Runway 9/27 at 90° angles.

The 2013 Pavement Condition Report indicated that Taxiways A and B require only preventative and corrective maintenance, respectively. Taxiways D and E are also listed as requiring only preventative maintenance.

There is a 60-foot-wide taxilane along the south edge of the apron.

2.4.4 Apron

Kotzebue Airport has a single, paved apron covering approximately 550,000 square feet. The 2013 Pavement Inspection Report indicated the apron has Pavement Condition Index (PCI) values in the 60-69 range and pavement between 10 and 14 years old. PCI values in the 60s warrant only corrective maintenance.

2.4.5 Runway Safety Areas

FAA design standards for an ARC C-III runway specify that the RSA be 500 feet wide and extend 1,000 feet beyond the runway ends.

The RSAs at OTZ have been the focus of considerable study. As of this writing, they are currently being expanded to 400 feet beyond the runway ends for Runway 9/27. This will leave the RSAs 600 feet short of FAA standards; however, the FAA determined that extending them to the full 1,000 feet was not practicable.

2.4.6 Building Restriction Line

The Building Restriction Line (BRL) defines the limit of development of all on-airport buildings. The FAA Airport Design AC does not establish standard setback distances for BRLs. Rather, the FAA recommends that the BRL encompass the runway object-free area (ROFA), runway protection zone (RPZ), areas required for clear line of sight, and navigational aid (navaid) critical areas. Although FAA offers only limited guidance on defining the appropriate location for BRLs, many airports use Federal Aviation Regulation (FAR) Part 77 imaginary surfaces to determine the airport's BRL. At Kotzebue, the BRLs are based on a 1,000-foot primary surface.

On the north side of Runway 9/27, the BRL is set as close as 750 feet from the runway centerline. For Block 2, Lots 1A, 1B, 2A, and 2B, the BRL moves to 790 feet. For Block 2, Lots 3 and 4, the BRL is set at 850 feet (see Figure 2-3). These BRLs prohibit buildings more than 35 feet tall, 41 feet tall, and 50 feet tall, respectively. None of the buildings adjacent to the terminal apron penetrate the transitional surface.

The current airport layout plan (ALP) shows the BRL for Runway 18/36 at 500 feet from the centerline for approximately 2,800 feet from the Runway 36 threshold and then extending out to meet the BRL for Runway 9/27. The BRL appears to have this layout to provide intervisibility between the main and crosswind runways. The U.S. Fish & Wildlife Service (USFWS) hangar and National Guard hangar are both within the BRL (see Figure 2-3); however, they do not penetrate the Part 77 transitional surface.

2.4.7 Approach Surfaces

The current approved ALP shows that the Runway 9 approach is free of obstructions other than the glide slope antenna, which is fixed by function. The ALP indicates that Runway 27 has a single obstruction, the localizer antenna, which is also fixed by function. Runway 36 has one obstruction—the sewage lagoon access road. The ALP indicates that the road is to remain, referencing it as "the best solution for access."

Runway 9 has a 50:1 approach surface, and Runway 27 has a 34:1 approach surface. Runways 18 and 36 each have 20:1 approach surfaces.

The new electronic gate that blocks vehicle access around the Runway 9 threshold protects against tall vehicles penetrating the approach surface while a plane is on final approach to Runway 9.

2.4.8 Lighting, Marking, and Signing

Navaids

Runway 9/27 has an ILS that consists of a localizer, distance measuring equipment (DME), and a glideslope. Additional radio navaids include a direction finder (DF), a Very High Frequency (VHF) Omnidirectional Range (VOR), a non-directional radio homing beacon (NDB), and a runway visual range (RVR). For visual approaches, Runway 9/27 has Precision Approach Path Indicators (PAPI) and runway end identification lights (REIL).

Runway 18/36 is a visual approach runway and does not have any navaids.

FAA has a 75 kW power plant for communications and FAA-maintained navaids.

Signage

Guidance signs provide the ability to easily determine the designation or name of taxiways and runways. The signs at OTZ meet these needs.

Stop signs and warning signs with flashing red lights are located on the road that crosses Taxiway F.

Lighting

Runway 9/27 has High Intensity Runway Lights (HIRL) while Runway 18/36 has Medium Intensity Runway Lights (MIRL).

2.4.9 General Aviation

Figure 2-4 – Transient Aircraft Parked in front of the ADOT&PF ARFF/SREB, July 2014

As of July 20, 2014, the FAA aircraft registration database lists 45 aircraft registered to individuals in Kotzebue. Of these 45, all but one are single-engine, fixed-wing aircraft. An additional 14 aircraft are registered as co-owned.

GA facilities at OTZ include:

- 12 tie-downs adjacent to terminal area:
  - 8 paved
  - 4 unpaved
- 38 gravel tie-downs along Runway 18/36, along the edge of Isaac Lake
- Flight Service Station (FSS); see description below

Float-equipped aircraft are also common at OTZ. Currently, they operate off Kotzebue Lagoon. During a site visit in July 2014, pilots indicated an interest in operating from a freshwater lake rather than the salt water of Kotzebue Lagoon and suggested Isaac Lake as a potential float pond. However, Isaac Lake is periodically drained for material removal during large-scale construction projects.

There is no formally designated transient parking. Larger aircraft such as corporate jets park in front of the ADOT&PF Aircraft Rescue and Firefighting/Snow Removal Equipment Building (ARFF/SREB) facilities (Figure 2-4). Smaller aircraft can use the tie-downs if spaces are available.

2.4.10 Airport Access, Parking, and Security

Third Avenue and Fifth Avenue intersect Airport Access Road and provide the primary access to the airport terminal area. Access to the crosswind runway and tie-downs is via Second Avenue and Air Force Road. Second Avenue is currently being reconstructed such that it will go around the west end of the RSA, approximately two feet below the grade of the RSA, to prevent vehicles from driving across it.

Perimeter fencing along the north side of the airport encompasses the lease lots, tie-downs, and apron area. Vehicle access around the Runway 9 threshold is to be controlled by electronically activated gates on the north and south sides. The gates can be closed by pilots during final approach and will remain closed for 10 minutes. These gates are currently being installed as part of the RSA project. In the meantime, ADOT&PF M&O staff are positioned near the approach end of Runway 9 during air carrier operations until the installation is complete.

Other than the gate stopping traffic around the Runway 9 threshold, there is no security fencing on the south side of the airport.

All gates in the security fence other than the two mentioned above are operated by lock and key. An electronically activated man gate may be installed as part of the RSA project to provide through-the-fence access for transient pilots. Ensuring that tenants secure all gates can be challenging, however.

Kotzebue sees an influx of sport hunters in August and September. These hunters often use local air taxis to transport them to the field. There have been reports of hunters storing game meat on the apron, as well as wandering around the apron with firearms.

Wildlife management is a concern at OTZ. The proximity of large water bodies to the airport attracts migratory waterfowl and seabirds that can pose a risk to approaching aircraft. Commercial fishing vessels have come fairly close to the airport at times, bringing with them flocks of seabirds. A wildlife hazard assessment is currently being developed.

There are two designated Security Identification Display Areas (SIDA): one in front of the Alaska Airlines terminal and one in front of the FBX facility.

The Transportation Security Administration (TSA) screens passengers and baggage inside the Alaska Airlines terminal. Passengers must pass through metal detectors and carry-on baggage is X-rayed. The TSA is currently evaluating the installation of full-body scanners at rural Alaska airports, including Kotzebue.

2.4.11 Airport Support Facilities and Utilities

Fueling

There are currently two on-airport fuel dispensing permits: one for Vitus Energy and one for Crowley Petroleum. Crowley provides Avgas 100LL, diesel fuel, heating fuel, jet fuel, and unleaded gasoline. Fuel is delivered to aircraft directly from fueling trucks. Vitus Energy began selling fuel oil and unleaded gasoline in Kotzebue in December 2013. They operate a 24-hour pay-at-the-pump station just off airport property.

Bering Air also sells fuel informally to pilots that request it. They do not have any plans or desire to develop a self-serve fuel station.

Flight Service Station

The Kotzebue Flight Service Station (FSS) is located within the ADOT&PF ARFF/SREB facility. It provides local pilots and air traffic with pilot briefings, weather, and coordination. The FSS facilities are relatively new, and there are no plans to expand, modify, or move them.

National Weather Service

The National Weather Service (NWS) office is located within the ADOT&PF ARFF/SREB facility. An Automated Surface Observing System (ASOS) provides 24-hour weather monitoring. Information from the ASOS is distributed to pilots by the FSS. The ASOS is located approximately 500 feet northeast of the Runway 18 approach end.

Utilities

The City of Kotzebue maintains a piped sewer and water system for the community, including the airport. Water comes from Devil's Lake Reservoir and is stored in two 1.5-million-gallon tanks. Sewage is treated in a 32-acre zero-discharge lagoon southwest of the airport. The sewage lagoon is over 30 years old and in need of improvements.

Kotzebue Electric Association, the electric utility cooperative, provides electricity to the community and airport. Electricity is generated through a variety of sources including diesel and wind.

The City of Kotzebue provides solid waste facilities for the community. A Class 2 landfill and solid waste transfer station were constructed within the past 10 years. The landfill is located approximately one mile south of Runway 18/36 and two and a half miles from Runway 9/27. The FAA guidance suggests that landfills should be more than 10,000 feet from any airport where jet aircraft are used.

Police and Fire Protection

The City of Kotzebue provides fire and police protection services to the community. The Alaska State Troopers maintain a post in Kotzebue and have a single aircraft based at OTZ.

2.5 Passenger Terminal Facilities

There are no consolidated passenger terminal facilities at OTZ. Instead, each air carrier or air taxi operates its own terminal. The three largest terminals are operated by Alaska Airlines, Ravn Alaska, and Bering Air. Previous master plans have identified a desire to consolidate all carriers into a single terminal.

The Alaska Airlines terminal is approximately 8,000 square feet. TSA screens passengers boarding Alaska Airlines flights in the terminal. Groups of approximately 20 passengers at a time are screened and escorted to the aircraft due to the size of the terminal facility. Alaska Airlines indicated that they are considering refurbishment of the terminal to accommodate additional TSA needs, but they do not expect to expand or relocate the facility.

The Ravn Alaska terminal and cargo facility was expanded in 2013. The new facility is approximately 12,000 square feet.

Bering Air operates an approximately 13,000-square-foot terminal with space for passengers and cargo handling.

2.6 USPS

The USPS utilizes OTZ as a regional postal hub, with most of the area's mail traffic related to goods moved through the Bypass Mail program (Northern Economics, 2011). Mail generally arrives from Anchorage and is then distributed to smaller communities in the region. The post office is located on Shore Avenue at the corner of Friends Way, approximately ½ mile from the airport's terminal area. Chapter 3, *Forecast of Aviation Demand*, will present mail volumes.

2.7 Airport Maintenance and Operations

ADOT&PF personnel are responsible for the maintenance and operation of the airfield, including snow removal, runway deicing and sanding, friction testing, wildlife management, security badging, and emergency response.

Kotzebue 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 operates an Aircraft Rescue and Firefighting (ARFF) facility on Lot AAA, Block 1. The ARFF is an Index B facility and was constructed less than 10 years ago. All maintenance and operations (M&O) staff are trained in aircraft firefighting, although the 2013 Part 139 Inspection indicated some staff needed additional training.

Snow from the apron is pushed into the airport infield and off the east edge of the apron. M&O staff reported drifting snow around the debris on the FAA property south of the Runway 9 threshold.

The primary runway is de-iced with a chemical deicing agent (potassium acetate) that is distributed from a 2,000-gallon tank truck with a sprayer bar. De-icing chemicals are stored in the M&O facilities in large plastic containers.

Aircraft operators are responsible for deicing their aircraft. There is no centralized deicing facility or equipment, so aircraft deice on the apron in front of their respective lease lot.

The M&O equipment fleet at OTZ is listed in Table 2-5.

Table 2-5 – Kotzebue Airport M&O Equipment

Equipment	Age (years)
Aeroil Pro asphalt heater	30
Oshkosh T1500 ARFF fire truck	27
Case 1150E bulldozer	24
International 2554 de-icing truck	20
Caterpillar 966FII Loader	19
Dodge pickup truck, extended cab, ¾-ton	15
EZ Liner palletized lane striper	15
Case 921C loader	11
Ford pickup truck, extended cab, 1-ton	11
Chevy Trailblazer	10
Schmidt MP318 snow blower	10
Henderson 8 cubic yard sander	9
International dump truck, 8-yard	8
Caterpillar 160M grader, 37,000LB	4
Ford pickup truck, crew cab, ½-ton	3
Oshkosh H2923B snow blower	2

2.8 Environmental, Cultural, and Meteorological Data

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 section is more detailed than in a typical airport master plan due to the availability of data from recent projects at OTZ.

2.8.1 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 at Kotzebue is significantly less than these levels; therefore, no air quality analysis is necessary.

2.8.2 Coastal Resources

The Kotzebue airport is within the former Alaska Coastal Management Program (ACMP) NWAB coastal zone management district. The ACMP website and agency are inactive. The federally approved ACMP expired on July 1, 2011, resulting in a withdrawal from participation in the National Coastal Management Program established by the Coastal Zone Management Act (CZMA). The CZMA federal consistency provision no longer applies in Alaska.

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

2.8.3 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.

There are no Section 4(f) lands defined for Kotzebue Airport. However, the presence of human remains on airport property (see Section 2.8.8) could potentially lead to Section 4(f) designation. In general, graves and graveyards are not eligible for listing on the NRHP but they can be listed if they meet certain criteria considerations. The burials may also be an indicator that the sites are Traditional Cultural Properties (TCPs). TCPs are properties whose significance is derived from the role the property plays in a community's historically rooted beliefs, customs, and practices. TCPs can be eligible for listing on the NRHP.

2.8.4 Prime and Unique Farmlands

There are no prime or unique farmlands in Kotzebue, as defined by the Farmland Protection Policy Act of 1981.

2.8.5 Fish and Wildlife Resources

Some common terrestrial mammals occasionally seen near the runway are small rodents, hares, foxes, and caribou. While the Kotzebue locale does not provide habitat for eagles, and there are no eagle nests in the project vicinity (USFWS, 2008), it is a productive breeding area for other waterfowl, shorebirds, and loons (USKH, 2012). Ravens are also common.

Anadromous Fish Streams and Essential Fish Habitat

Essential fish habitat (EFH) has not been mapped for Kotzebue Sound. However, EFH species, which include saffron cod (*Eleginus gracilis*), Arctic cod (*Boreogadus saida*), Alaska snow crab (*Chionoecetes opilio*), and all five species of Pacific salmon are known to be present (M. Eagleton, National Marine Fisheries Service [NMFS], personal communication, January 27, 2010, as referenced in USKH 2012). Alaska snow crab and Pacific salmon use the Kotzebue Sound as a migration corridor. Although not a catalogued anadromous water body, the brackish waters of Kotzebue Lagoon are known to support resident fish and Arctic char as they migrate to June Creek (J. Magdanz, Alaska Department of Fish & Game [ADF&G], personal communication, August, 2009, as referenced in USKH, 2012). ADF&G has indicated that herring and capelin use Kotzebue Lagoon as spawning and rearing habitat (R. McLean, personal communication, September 22, 2009, as referenced in USKH, 2012). Epifaunal (e.g., phytoplankton and zooplankton) and infaunal species (e.g., nematodes, amphipods, and bivalves) can be found both in Kotzebue Sound, and in greater abundance in the lagoon, where they serve as prey species for fish (USKH, 2010).

Threatened and Endangered Species

No terrestrial mammals listed as endangered or threatened by the USFWS in Alaska are likely to be found in the study area.

Birds

Species range maps for the Steller's eider *(Polysticta stelleri)* and spectacled eider (*Somateria fischeri*), both threatened, include the Baldwin Peninsula (ADF&G, 2011). However, a May 2000 Section 7 findings letter from the USFWS for another project nearby (Kotzebue Roads/Shore Avenue Project) stated that both species have not been known to nest in Kotzebue, they migrate further offshore, and they are not known within the proposed project area (ADOT&PF, 2006). On June 6, 2011, USFWS concurred with this previous finding as applicable to the proposed project area (USKH, 2012).

Marine Mammals

Bowhead, fin, and humpback whales are listed as endangered species, and their ranges include the Kotzebue Sound; however, no critical habitat is designated in Alaska for these endangered whales.

Kotzebue Sound is within federally designated polar bear (*Ursus maritimus*) critical sea ice habitat. The project footprint overlaps with critical sea ice habitat, but no federally designated

barrier island, terrestrial denning, or no-disturbance zones are within the project area or associated with the Baldwin Peninsula. However, ringed seals (*Phoca hispida*) and bearded seals (*Erignathus barbatus*), which are polar bear prey species, are found in Kotzebue Sound (USKH, 2012).

State-Listed Species of Special Concern

As of August 15, 2011, ADF&G no longer maintains a Species of Special Concern list. The State is responsible for determining and maintaining a list of endangered species in Alaska. The five State-listed species (short-tailed albatross, Eskimo curlew, blue whale, humpback whale, and right whale) are also listed as endangered species under the federal Endangered Species Act.

Wildlife Hazards

Bird and wildlife attractants near or on airfields are incompatible with air operations. The FAA online Wildlife Strike Database (http://wildlife.faa.gov) provides strike data for the Ralph Wien Memorial Airport. Twenty-one strikes have been reported since 1991. Fourteen of these strikes have occurred in the last 10 years, seven in the last 5 years. 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. A wildlife hazard assessment is scheduled for 2015.

2.8.6 Floodplains

Kotzebue is located along the shoreline of Kotzebue Sound. The City of Kotzebue participates in the National Flood Insurance Program, and Flood Insurance Rate Maps (FIRM) are available for the area encompassed by the project (FIRM 020059 0011 B). Kotzebue Lagoon and areas surrounding the airport lie within the Federal Emergency Management Agency's mapped 100-year floodplain. The Kotzebue area is susceptible to flooding resulting from storm surges (USKH, 2012). According to U.S. Army Corps of Engineers (USACE) data, an August 1990 flood caused by a coastal storm likely represents a 100-year event. It was reported that floodwaters did not reach the first floor of any major buildings in Kotzebue (USKH, 2012). During a similar, September 1986 coastal storm, there were also no reports of buildings flooded (USKH, 2012). The USACE considers the flood hazard at Kotzebue to be low (USKH, 2012).

2.8.7 Hazardous Materials, Pollution Prevention, and Solid Waste

The Kotzebue Airport has been in operation since the 1940s. Numerous environmental records exist for the airport as they pertain to contaminated sites, hazardous materials, and cleanup efforts that have occurred over the last two decades. Most of these activities are restricted to the developed areas adjacent to the runway surfaces on the apron, lease lots, maintenance facilities, and adjacent FAA Flight Service Station. Several monitoring wells that are monitoring groundwater quality within these areas are located in and around the airport apron and lease lots. Surface water and groundwater in the apron area is contaminated with petroleum and benzene, related to past incidences of leaking underground storage tanks (USKH, 2012). Surface water in

the apron area currently drains both east and west, directly into Kotzebue Lagoon and Kotzebue Sound through culverts. The Alaska Department of Environmental Conservation (ADEC) reports show the surface and groundwater contamination in the apron area has migrated to both Kotzebue Lagoon and Kotzebue Sound.

A search of the ADEC contaminated sites and leaking underground storage tank (LUST) databases on April 23, 2012, identified numerous contaminant releases, spills, and underground storage tank leaks within airport property and adjacent lands (USKH 2012); see Table 2-6. Seven of the contaminated sites on airport property remain active and three sites have been closed.

Table 2-6 - Contaminated Sites and LUSTs in Project Vicinity

Site Name	Hazard ID	Location	Description	Status
FAA Kotzebue Airport	814	Den Road	Petroleum contamination of soils and groundwater	Active
ADOT&PF MarkAir - Kotzebue Airport	2497	Block 1, Lots A, C, D Ralph Wien Airport	Petroleum contamination of soils and groundwater	Active
Kotzebue Airport – Alaska Airlines	24439	Block 1, Lots E, F, G Ralph Wien Airport	Petroleum and benzene contamination of soils and groundwater	Active
Kotzebue Airport – Northwest Aviation	24444	Block 2, Lot 4 Ralph Wien Airport	Petroleum contamination of soils	Active
Kotzebue Airport – Crowley Marine Services	24895	Block 4, Lot 1 Ralph Wien Airport	Petroleum and benzene contamination of soils and groundwater	Active
Kotzebue Airport – ADOT&PF Maintenance Station	25111	Block 1, Lots AAA Ralph Wien Airport	Petroleum and benzene contamination of soils and groundwater	Active
Kotzebue Airport - Lot M, Block 1	25557	Block 1, Lot M Ralph Wien Airport	Petroleum and benzene contamination of soils and groundwater	Active
Kotzebue Army Aviation Facility	2494	Ralph Wien Airport	Petroleum contamination of soils	Cleanup Complete
FAA - Kotzebue	25026	FAA Facilities at Ralph Wien Airport	Petroleum contamination of soils	Cleanup Complete
Kotzebue NANA UST	25029	Block 2, Lot 2 Ralph Wien Airport	Petroleum contamination of soils	Cleanup Complete

Commercial fueling of aircraft is provided by Crowley Marine Services from refueling trucks. ADOT&PF stores de-icing chemicals in their new sand/de-icing chemical storage facility located on the airport apron. A landfill that serves the City of Kotzebue and the airport is located 2.5 miles south of the airport property. A sewage lagoon operated by the City lies within the airport boundary next to Isaac Lake. ADOT&PF will coordinate with ADEC throughout the design process to ensure any disturbance to contaminated areas is handled in an ADEC-approved manner.

2.8.8 Historical, Architectural, Archaeological, and Cultural Resources

Kotzebue is located on a series of beach ridges that were occupied during the prehistoric period. Archaeological materials have been unearthed in the vicinity reflecting multiple periods in human prehistory: the Northern Archaic Tradition (6,000 to 4,500 years ago), the Arctic Small Tool Tradition (4,500 to 1,000 years ago), and other manifestations referred to as the Northern Maritime Tradition (from 1,500 years ago to the Kotzebue historic period, beginning in 1897) (USKH, 2012). The prehistoric features and artifacts are widely scattered and buried such that they have broadly been assigned to one Alaska Historic Resource Survey (AHRS) site number: KTZ-036, the Kotzebue Archaeological District. The known historic sites include buildings and are known collectively as the Front Street Historic District (KTZ-250) (USKH, 2012).

Kotzebue Archaeological District (KTZ-036) encompasses both the City of Kotzebue and the airport. Table 2-7 summarizes information from the AHRS (USKH, 2012).

Table 2-7 - AHRS Sites at Kotzebue

AHRS #	Name
KTZ-001	Historic Kotzebue
KTZ-031	Old Kotzebue
KTZ-036	Kotzebue Archaeological District
KTZ-038	Pre/protohistoric house wall
KTZ-229	Burials (south end of town)
KTZ-233	NANA Museum Site
KTZ-250	Front Street Historic District
KTZ-251-295	Individual Buildings in KTZ-250

In June 2012, the FAA, DOT&PF, SHPO, the Native Village of Kotzebue, and the Northwest Arctic Borough signed an MOA that formally develops plans for phased identification, evaluation, and mitigation of adverse effects to historic and culturally significant sites as a result of the RSA Improvement project (USKH, 2012). Since construction on the RSA began in 2013, there has been ongoing recovery of human remains on airport property.

2.8.9 Light Emissions and Visual Impacts

No concerns about light emissions have been raised by the community. No major changes are proposed for the airfield lighting that would increase the visual impacts to the surrounding properties.

2.8.10 Noise

Recent airport projects have not raised concerns about airport noise. Generally, when annual operations are below 90,000 propeller operations or below 700 jet operations, the cumulative

noise levels of greater than 65 Day Night Average Sound Level (DNL) typically remain within the airport's property line. If future forecast operations go beyond these levels, it would be appropriate to prepare Noise Contour maps using the FAA's Integrated Noise Model to assess the impacts of noise outside of the airport property.

2.8.11 Socioeconomic Impacts

Socioeconomic conditions in Kotzebue are described in Chapter 3, Aviation Demand Forecasts.

2.8.12 Receiving Waters/Impaired Water Bodies/Water Quality

A search of the ADEC website http://dec.alaska.gov/water/wqsar/Docs/2010impairedwaters.pdf on August 28, 2014, revealed no impaired waterbodies in the project area. The water supply for the community and the airport comes from two large lakes, Vortac Lake and Devils Lake, located 1.5 miles east of the airport. Wetlands on the airport property and surrounding area may be influenced by surface runoff from the airport runway, aprons, and adjacent fuel storage and handling facilities containing hydrocarbons and other pollutants.

2.8.13 Wetlands and Vegetation

USKH prepared a wetlands summary report that compiled previous existing data on wetlands at the airport and evaluated and updated wetlands mapping with current, high resolution aerial photography and ground photography to determine the extent of wetlands within the footprint of the proposed project (USKH, 2012). Previous studies at Kotzebue Airport have documented large extents of wetlands in the project area, including open water areas and saltwater marshes along the edges of Kotzebue Lagoon. Approximately 80 percent of the airport property is comprised of wetlands and open water. Non-wetland areas are developed areas of the airport or areas that are highly disturbed due to airport maintenance or operations. All of the wetlands within the airport boundary have been determined jurisdictional due to their close proximity or groundwater connection to Kotzebue Sound and the Kotzebue Lagoon.

The functional value of wetlands and aquatic areas near the airport are influenced by a short growing season, wildlife and fish uses, tidal waters of Kotzebue Sound, and the close proximity of a population center and industrial development. The primary functions of the airport area wetlands and aquatic areas are retaining of sediment, toxicants, and nutrients, some buffering against storm surges, and providing migratory bird habitat. Due to the predominance of frozen soils, disturbed nature of many of these wetlands, and the hazing of birds for safety purposes, their functional capacity is somewhat limited. Wetland values in the project area are generally moderate to low.

2.8.14 Wild and Scenic Rivers

There are no designated state or federal wild or scenic rivers in the vicinity of Kotzebue (http://www.rivers.gov/alaska.php).

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

There are no state designated refuges, critical habitat areas, wildlife ranges, or sanctuaries in the project vicinity (ADF&G, 2010).

2.9 Related Plans, Programs, and Projects

2.9.1 1983 Ralph Wien Memorial Airport Terminal Area/Land Use Plan

The terminal area/land use plan was developed to address the increased demand for expanded facilities in the terminal area. The study examined the potential location for a multiple-carrier passenger terminal building and developed a plan for accommodating additional lease lots in the terminal area. The plan recommended expanding the apron to the east and the construction of a joint carrier terminal in the northeast corner of the expanded apron.

2.9.2 1989 Ralph Wien Memorial Airport Master Plan

The 1989 master plan expanded on the 1983 terminal area/land use plan to include the first comprehensive look at all of the facilities at OTZ. The forecast chapter of the plan indicated the potential for 70,000 enplanements and 70,500 operations by 2005. The master plan also examined the possibility of relocating the airport. Ultimately the plan concluded that expanding the existing airport was most beneficial for future airport development.

2.9.3 1993 Northwest Arctic Borough Comprehensive Plan

The NWAB developed a comprehensive plan in 1993 to plan for future growth and needs of the Borough, determine what land use controls might be necessary in the region, and provided guidance for the management of Borough-owned lands.

2.9.4 1998 Kotzebue Airport Master Plan Update

The 1998 airport master plan update identified several development components in the preferred alternative:

- Full-length parallel taxiway for Runway 9/27
- Relocation of the GA tie-downs adjacent to Runway 18/36
- Formal float pond with launch ramp and floatplane parking on Isaac Lake
- Relocation of jet aircraft parking and development of a multiple-carrier terminal on the northeast corner of the apron

2.9.5 2004 Northwest Alaska Transportation Plan

A planning team led by ADOT&PF completed a two-year planning process that investigated and compared various marine, air, road, and rail alternatives to existing area transportation systems. Using current and projected population figures for the next 20 years, the Northwest Alaska Transportation Plan established air and marine infrastructure requirements and potential highway and railroad connections.

2.9.6 2008 Kotzebue Airport Relocation Feasibility Study

The 2008 relocation feasibility study was a precursor to this master plan update. The study divided the Baldwin Peninsula into three general areas and evaluated each in terms of the issues and benefits that could affect the feasibility of relocating the airport there. Ultimately, the study determined that relocating the airport was impractical due to financial constraints with such an ambitious project.

2.9.7 2012 Final EA and Finding of No Significant Impact – Kotzebue Airport RSA Improvements

In October 1999, the FAA issued Order 5200.8, *Runway Safety Area Program*, which requires airports to provide a standard RSA to the extent practicable for the type of aircraft regularly operating at a facility. The ADOT&PF identified OTZ as having deficient RSAs and initiated a practicability study to determine to what extent the RSAs could be expanded. The practicability study (completed in 2010) led to the environmental assessment of several options and ultimately determined that widening the RSA was impractical, but they could be lengthened by 400 feet on each runway end.

During the environmental process, the residents of Kotzebue expressed concern about maintaining access to areas south of the airport. The RSA improvements therefore included an access road around the west end of the runway that would be secured with electronic gates. This concept was determined to provide adequate airfield security while maintaining resident access to the south.

2.9.8 2013 Alaska Aviation System Plan

The Alaska Aviation System Plan (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 planning.

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

2.9.9 2013 City of Kotzebue Comprehensive Plan

The City of Kotzebue Comprehensive Plan analyzed past development, created a vision for the community, and established policies to guide future development. This community plan does not make any recommendations for the airport, but does indicate that the location of the airport inhibits expansion of the community. While the plan supports the ADOT&PF efforts to improve the airport, it also suggests re-evaluating the possibility of airport relocation in the future (p. 49).

2.9.10 Kotzebue to Cape Blossom Road

The concept of a road from Kotzebue to Cape Blossom has been around for some time. The first formal study of this connection was in 1977, followed by renewed studies in 1983, 2004, 2011, and 2013:

- Feasibility Analysis 1977
- Feasibility Analysis 1983
- Fuel Cost Savings Analysis 2004
- Reconnaissance Study 2011
- Environmental Assessment & Finding of No Significant Impact 2013

The impetus for a road to Cape Blossom is to develop a deep-water port that would reduce the cost of barging freight to Kotzebue. Because Kotzebue Sound is so shallow, goods must be lightered from vessels anchored approximately 15 miles offshore.

The preferred alternative from the EA and Finding of No Significant Impact (FONSI) is to upgrade portions of Air Force Road between New Hillside Road and the KEA wind farm. From the wind farm south, a new two-lane gravel road would be constructed for 8.9 miles to a beach access ramp approximately one mile east of Cape Blossom.

Because Air Force Road crosses airport property, traffic across the airport may increase.

2.9.11 2014 Final Supplemental Environmental Assessment – Kotzebue Airport RSA Improvements

The contractor selected to construct the RSA improvements requested permission from ADOT&PF to dredge a barge access channel and landing site and to mine material from Isaac Lake. To address community concerns about the disruption of the longshore channel associated with this proposal, a supplemental EA was developed. The EA documented that the construction of a temporary barge channel would not have lasting effects on the longshore channel.

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USKH Inc. (2014). Final Supplemental Environmental Assessment: Kotzebue Airport and Safety Improvements – Stage III Project. Prepared for the United States Department of Transportation Federal Aviation Administration.

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. Kotzebue's location and history have placed it as the hub for goods and services throughout the Northwest Arctic Borough. Its location at the confluence of three major rivers and ocean portage make it an ideal transfer point for ocean shipping, inland shipping, and air transport. The vast majority of income comes from employment related to the public sector, including work with the city of Kotzebue, the Northwest Arctic Borough (NWAB) and NWAB School District, and the Maniilaq Association. Subsistence activities continue to be an integral part of the residents' lifestyle. Mining for minerals at the Alaska Red Dog Mine (which has its own airport) provides a substantial boost to the economy (*Northwest Arctic Borough, nwabor.org*).

Base passenger enplanements at Kotzebue Airport (OTZ) reported to the Federal Aviation Administration (FAA) for the year 2013 were 61,274. With a median 0.9% annual increase, enplanements could reach 73,299 by 2033. Similarly, operations at OTZ could increase from 48,819 to 58,204.

The methodology used for the Kotzebue Airport enplanement and air traffic forecasts 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:

- Identify aviation activity measures
- Review previous airport forecasts
- Gather data
- Select forecast methods
- Apply forecast methods and evaluate results
- Compare forecast results with FAA's Terminal Area Forecasts
- 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 (GA) 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 fleet mix through increased operations or larger aircraft. Kotzebue Airport is primarily a commercial service airport with considerable GA activity.

Practical considerations dictate the level of detail and effort that should go into an airport planning forecast (FAA, 2001). The aircraft fleet in use at Kotzebue comprises commercial passenger and passenger-cargo combination jets and turboprop aircraft**,** commercial cargo aircraft, single- and twin-engine GA aircraft, and corporate jets. 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 Kotzebue will focus on:

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

3.2 Step 2 – Collect and Review Previous Airport Forecasts

Relevant forecasts for Kotzebue and the surrounding area are summarized below. These include the FAA Terminal Area Forecast (TAF), the Alaska Aviation System Plan (AASP), the 1998 Kotzebue Airport Master Plan, the National Plan of Integrated Airport Systems, and the 1993 Northwest Arctic Borough Comprehensive Plan.

3.2.1 Federal Aviation Administration Terminal Area Forecast

Table 3-1 – FAA Terminal Area Forecast (2013), Kotzebue Airport

Passenger Enplanements			Itinerant Operations			Local Operations		
Air Carrier	Commuter	Total	Air Carrier	Commuter / Air Taxi	GA	Military	Civil	Total Operations
30,295	33,831	**64,126**	2,000	20,000	30,000	1,000	7,000	**60,000**

The FAA TAF for Kotzebue Airport is summarized in Table 3-1. The TAF projects activity for airports across the nation, including passenger enplanements, aircraft operations, and based aircraft for major uses of the airport (air carriers, air taxi and commuters, general aviation, and military). 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.

Table 3-2 - Passenger Enplanements (2004-2013), Kotzebue Airport

Year	TAF	ACAIS	Difference (ACAIS - TAF)
2004	58,719	58,999	**280**
2005	58,217	58,140	**-77**
2006	60,411	63,417	**3,006**
2007	64,424	64,717	**293**
2008	65,444	66,322	**878**
2009	58,350	57,472	**-878**
2010	59,446	62,177	**2,731**
2011	63,133	62,738	**-395**
2012	62,628	63,032	**404**
2013	64,126	61,274	**-2,852**

Source: FAA and USDOT, RITA

The FAA also maintains historic passenger and cargo data in the Air Carrier Activity Information System (ACAIS), a database that contains revenue passenger boarding and all-cargo data as reported by the airlines. Table 3-2 compares historic TAF estimates with actual enplanements in Kotzebue from the ACAIS to illustrate the differences between these two databases.

3.2.2 Alaska Aviation System Plan

The AASP is a component of ADOT&PF's Statewide Transportation Plan. The AASP forecasts (June 2011) contain 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 Forecast, Kotzebue Airport

Measure of Activity	2008 (base)	2015	2020	2030
Enplanements	64,944	70,144	74,055	82,429
Cargo Tonnage	20,650	22,403	23,662	26,338
Critical Aircraft	737-200	737-200	737-200	737-200
Aircraft Operations				
Commercial Operations	28,642	29,592	31,256	37,276
General Aviation	37,000	38,228	40,377	48,156
Based Aircraft - Single Engine	40	42	44	49
Based Aircraft - Multi Engine	12	13	13	14
Based Aircraft – Jet	0	0	0	0
Based Helicopter	0	0	0	0
Military Operations	1,000	1,038	1,089	1,300
Total Aircraft Operations	**66,694**	**68,913**	**72,779**	**86,795**

3.2.3 Kotzebue Airport Master Plan Update (1998)

In 1998, ADOT&PF updated the Kotzebue Airport Master Plan. This update forecast aircraft operations and passenger enplanements as summarized below.

Table 3-4 - 1998 Kotzebue Airport Master Plan Update Aviation Forecast

	1995 (base)	2003	2008	2018
Enplanements	50,905	66,534	74,183	84,200
Cargo (tons)	21,673	26,394	29,867	38,287
Commercial Operations	20,000	23,660	25,850	28,670
GA Operations	30,000	36,800	40,900	49,250
Military Operations	1,000	1,000	1,000	1,000

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 Kotzebue (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	66,322
Based Aircraft	52

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 - *Northwest Alaska Transportation Plan* Enplanement Forecast for Kotzebue

Year	2005	2010	2015	2020	2025
Enplanements	63,935	67,821	71,913	75,633	78,924

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.

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

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

3.3.1 Historic Aviation Activity

The composition of aviation activity at OTZ has increased only slightly since the 1998 airport master plan. Enplanements have grown more slowly than projected by both the Kotzebue Airport Master Plan (1998) and the *Northwest Alaska Transportation Plan* (2004).

Over the last 10 years, Alaska Airlines has provided the greatest number of enplanements, while Bering Air Inc. and Hageland Aviation Service (now part of Ravn Alaska[1]) provided the greatest number of passenger flights. Over the same period, Bering Air Inc., and Arctic Transportation shipped the most freight and mail by weight, while Bering Air Inc. and Hageland Aviation Service provided the greatest number of flights carrying freight and mail.

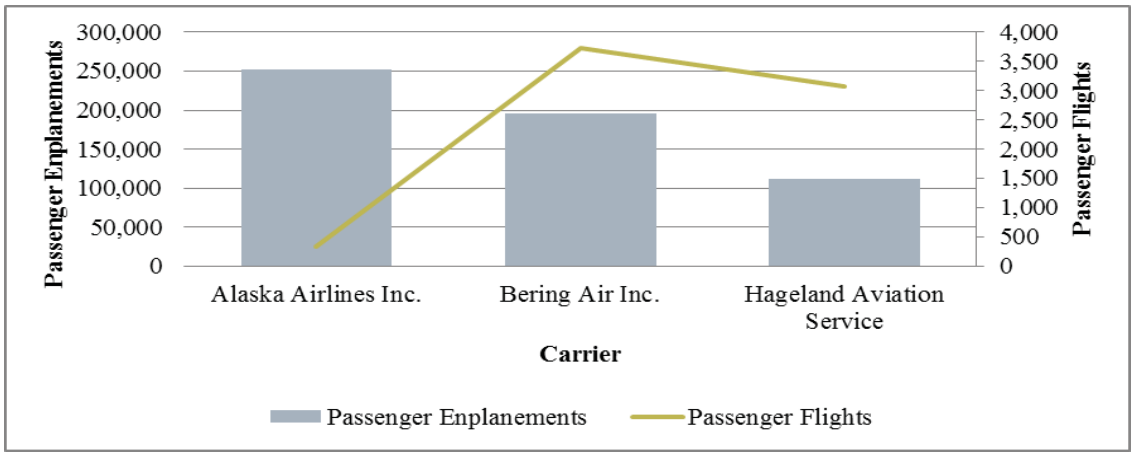


Figure 3-1 – Passenger Enplanements and Passenger Flights, 2004-2013

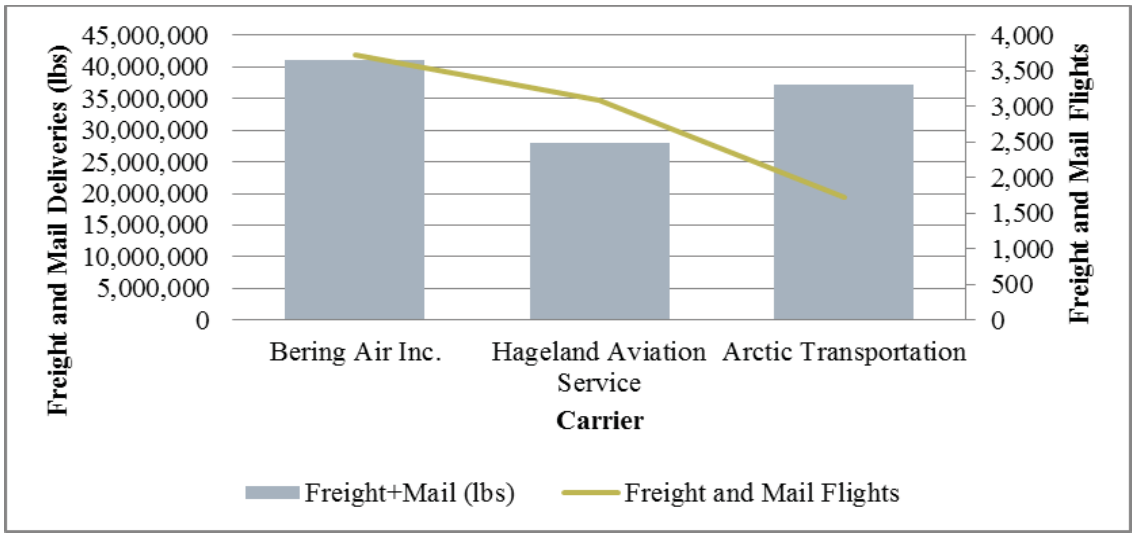


Figure 3-2 – Freight & Mail Deliveries and Freight & Mail Flights, 2004-2013

[1] Between 2005 and 2010, a series of mergers consolidated five regional airlines—Cape Smythe Air, Frontier Flying Service, Hageland Aviation, Era Aviation, and Arctic Circle Air—into a single company, now doing business as Ravn Alaska. The parent company still operates aircraft under the Hageland, Era, and Frontier names and reports their data on the Form 41 Schedule T-100 as individual carriers.

Historic passenger and cargo data are maintained by the FAA in the ACAIS, a database that contains revenue passenger boarding and all-cargo data. The 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.

3.3.2 Aircraft Operations

Table 3-7 contains aircraft operations forecast data for Kotzebue Airport from 2003 to 2012 as reported in the TAF.

Table 3-7 – TAF Historic Aircraft Operations (2003-2013), Kotzebue Airport

Year	Itinerant Operations				Local Operations		Total Operations
	Air Carrier	Air Taxi	GA	Military	GA	Military	
2003	2,000	20,000	30,000	1,000	7,000	0	**60,000**
2004	2,000	20,000	30,000	1,000	7,000	0	**60,000**
2005	2,000	20,000	30,000	1,000	7,000	0	**60,000**
2006	2,000	20,000	30,000	1,000	7,000	0	**60,000**
2007	2,000	20,000	30,000	1,000	7,000	0	**60,000**
2008	2,000	20,000	30,000	1,000	7,000	0	**60,000**
2009	2,000	20,000	30,000	1,000	7,000	0	**60,000**
2010	2,000	20,000	30,000	1,000	7,000	0	**60,000**
2011	2,000	20,000	30,000	1,000	7,000	0	**60,000**
2012	2,000	20,000	30,000	1,000	7,000	0	**60,000**
2013	2,000	20,000	30,000	1,000	7,000	0	**60,000**

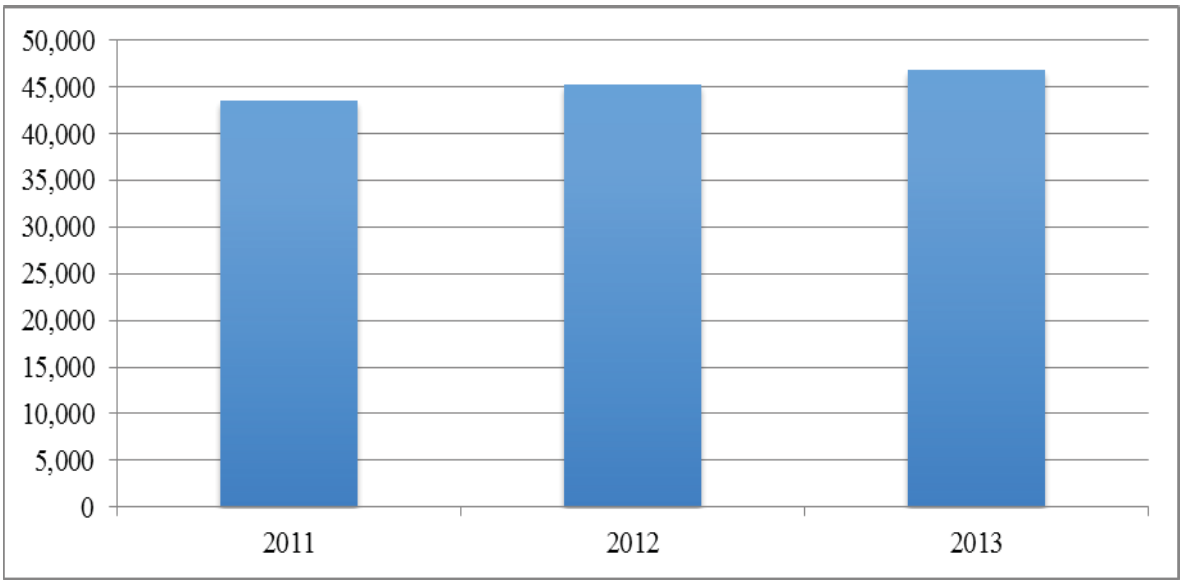


Figure 3-3 – Number of Aircraft Advisories Issued by Kotzebue FSS, 2011-2013
Source: FAA, 2014

In the absence of control tower records, the numbers of Airport Advisories issued by the Kotzebue FSS for the past three 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 Kotzebue, the FSS is open from 7:00 a.m. until 12:00 a.m.

The FAA's Form 5010, *Airport Master Record,* also estimates aircraft operations at Kotzebue Airport. Table 3-8 lists the operations estimated on the latest Form 5010 (dated July 24, 2014; last inspection date January 1, 2013).

Table 3-8 - Kotzebue Master Record (Form 5010) Operations

Operation Type	Total Operations
Air Carrier	2,000
Air Taxi	20,000
GA Local	7,000
GA Itinerant	30,000
Military	1,000
Total Operations	**60,000**

3.3.3 Fleet Mix and Based Aircraft

Table 3-9 lists the fleet of aircraft, by commercial carrier or agency that landed at Kotzebue Airport at least once during 2013 (RITA, 2014).

Table 3-9 - Current Fleet Mix Using Kotzebue Airport

Carrier	Aircraft	
Alaska Airlines Inc.	Boeing 737-400	Boeing 737-700/700LR
Alaska Central Express	Beech 1900 A/B/C/D	
Arctic Transportation	Casa/Nurtanio C212 Aviocar Pilatus PC-12	Cessna C206/207/209/210 Stationair
Bering Air Inc.	Beech 1900 A/B/C/D Casa/Nurtanio C212 Aviocar Piper PA-31 (Navajo)/T-1020 Bell 500	Beech 200 Super Kingair Cessna 208 Caravan Robinson R44
Ravn Alaska	Beech 1900 A/B/C/D Cessna 208 Caravan De Havilland DHC8-100 Dash-8 Shorts 330	Cessna 206 Stationair Cessna 406 Caravan II Piper PA-31 (Navajo)/T-1020
Lynden Air Cargo	Lockheed L100-30/L-382E	
Northern Air Cargo, Inc.	Boeing 737-100/200	Boeing 737-300
Tatonduk Outfitters, Ltd.	McDonnell Douglas DC-6A	McDonnell Douglas DC-9-30
Warbelows Air Ventures	Piper PA-31 (Navajo)/T-1020	
Wright Air Service	Beech Bonanza Piper PA-31 (Navajo)/T-1020	Helio H-250/295/395

The TAF identifies the number of based aircraft at Kotzebue at a consistent 52 aircraft every year over the past decade (see Table 3-10). The FAA's Form 5010, *Airport Master Record*, indicates a slightly lower number of 43 based aircraft in 2013.

Table 3-10 – Terminal Area Forecast Based Aircraft, 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Aircraft	52	52	52	52	52	52	52	52	52	52

3.3.4 Passengers

Passenger traffic at Kotzebue Airport has been trending upwards over the last 10 years, growing at a compound annual rate of approximately 0.5% (Figure 3-4). There was a notable dip in 2009, associated with the economic downturn. A general upward trend in passenger traffic has continued since the early 1990s, with 2008 seeing an all-time high of 66,322 enplanements.

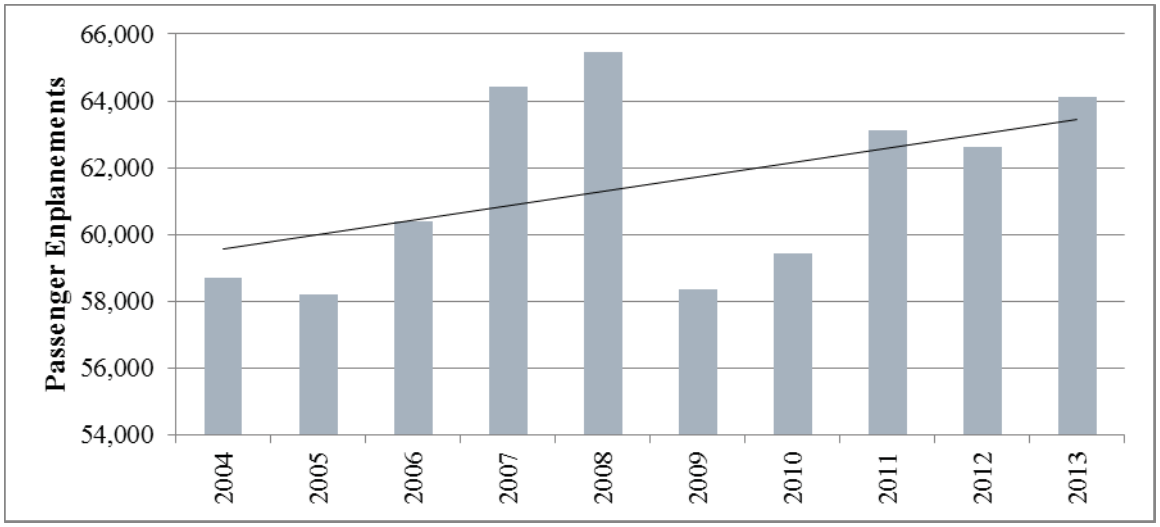
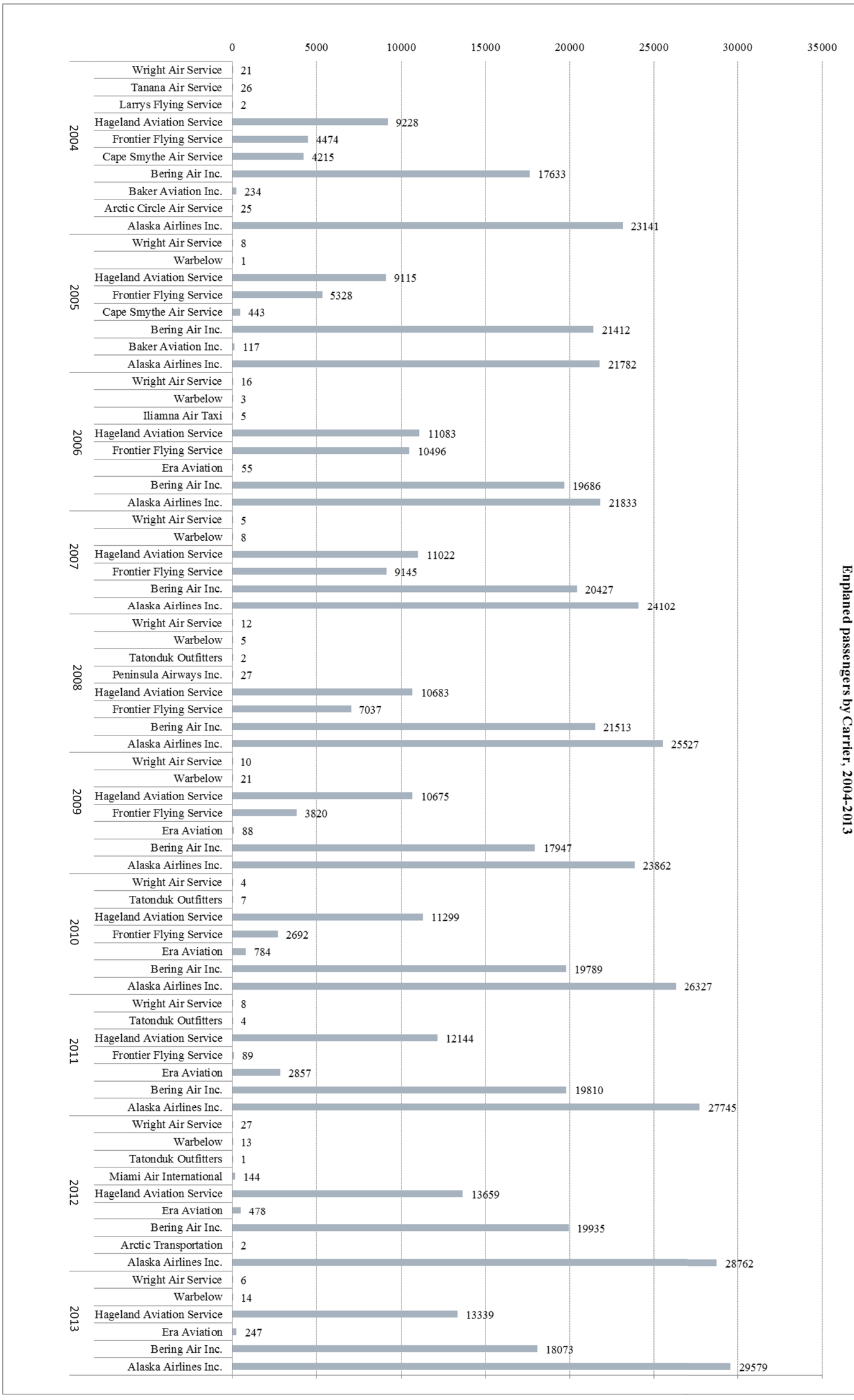


Figure 3-4 - Historic OTZ Passenger Enplanements, 2004-2013
Source: RITA, 2014

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

- Alaska Airlines
- Bering Air Inc.
- Ravn Alaska

Figure 3-5 shows the breakdown of passenger enplanements by carrier. Since 2004, Kotzebue has seen an increase in passenger enplanements but a consolidation of passenger service to three primary carriers. Alaska Airlines accounts for the majority of scheduled passenger enplanements at OTZ, with 29,579 in 2013. Bering Air Inc. carries the next most passengers, with 18,073 enplanements in 2013, and Ravn Alaska follows with 13,339 enplanements in 2013.


0
5000
10000
15000
20000
25000
30000
35000
2004
Wright Air Service 21
Tanana Air Service 26
Larrys Flying Service 2
Hageland Aviation Service 9228
Frontier Flying Service 4474
Cape Smythe Air Service 4215
Bering Air Inc. 17633
Baker Aviation Inc. 234
Arctic Circle Air Service 25
Alaska Airlines Inc. 23141
2005
Wright Air Service 8
Warbelow 1
Hageland Aviation Service 9115
Frontier Flying Service 5328
Cape Smythe Air Service 443
Bering Air Inc. 21412
Baker Aviation Inc. 117
Alaska Airlines Inc. 21782
2006
Wright Air Service 16
Warbelow 3
Iliamna Air Taxi 5
Hageland Aviation Service 11083
Frontier Flying Service 10496
Era Aviation 55
Bering Air Inc. 19686
Alaska Airlines Inc. 21833
2007
Wright Air Service 5
Warbelow 8
Hageland Aviation Service 11022
Frontier Flying Service 9145
Bering Air Inc. 20427
Alaska Airlines Inc. 24102
2008
Wright Air Service 12
Warbelow 5
Tatonduk Outfitters 2
Peninsula Airways Inc. 27
Hageland Aviation Service 10683
Frontier Flying Service 7037
Bering Air Inc. 21513
Alaska Airlines Inc. 25527
2009
Wright Air Service 10
Warbelow 21
Hageland Aviation Service 10675
Frontier Flying Service 3820
Era Aviation 88
Bering Air Inc. 17947
Alaska Airlines Inc. 23862
2010
Wright Air Service 4
Tatonduk Outfitters 7
Hageland Aviation Service 11299
Frontier Flying Service 2692
Era Aviation 784
Bering Air Inc. 19789
Alaska Airlines Inc. 26327
2011
Wright Air Service 8
Tatonduk Outfitters 4
Hageland Aviation Service 12144
Frontier Flying Service 89
Era Aviation 2857
Bering Air Inc. 19810
Alaska Airlines Inc. 27745
2012
Wright Air Service 27
Warbelow 13
Tatonduk Outfitters 1
Miami Air International 144
Hageland Aviation Service 13659
Era Aviation 478
Bering Air Inc. 19935
Arctic Transportation 2
Alaska Airlines Inc. 28762
2013
Wright Air Service 6
Warbelow 14
Hageland Aviation Service 13339
Era Aviation 247
Bering Air Inc. 18073
Alaska Airlines Inc. 29579
Enplaned passengers by Carrier, 2004-2013

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3.3.5 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 Kotzebue can receive barge shipments during the ice-free months, but rely on air service to deliver goods year-round. 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.

Figure 3-6 shows the historic mail volumes passing through OTZ from 2004 to 2013. Mail volumes have been consistent during this time, with approximately 15 million pounds deplaned and 10 million pounds enplaned at OTZ. Figure 3-7 outlines the historic freight volumes passing through OTZ. The 10-year trend for freight shows an approximate 27,000-pound net increase in freight deplaned at OTZ and an approximate 1.8-million-pound increase in freight enplaned at OTZ.

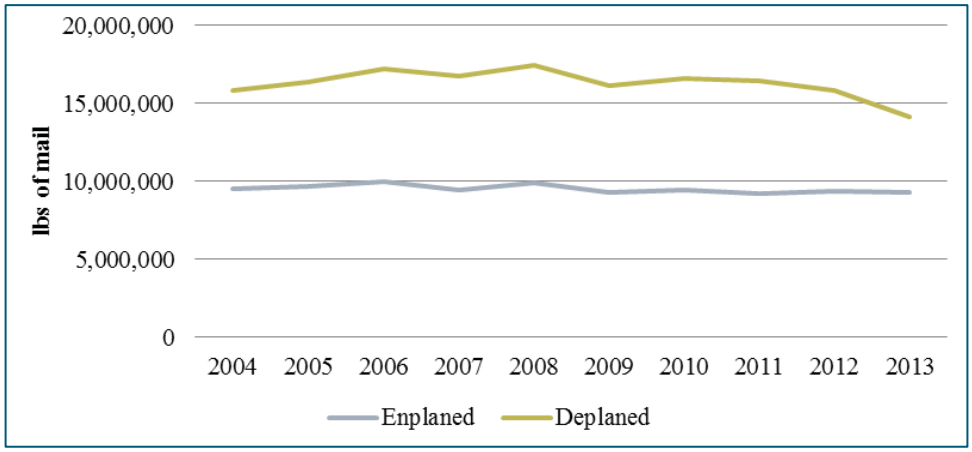

Figure 3-6 - OTZ Mail Volumes, 2004-2013
Source: RITA, 2014

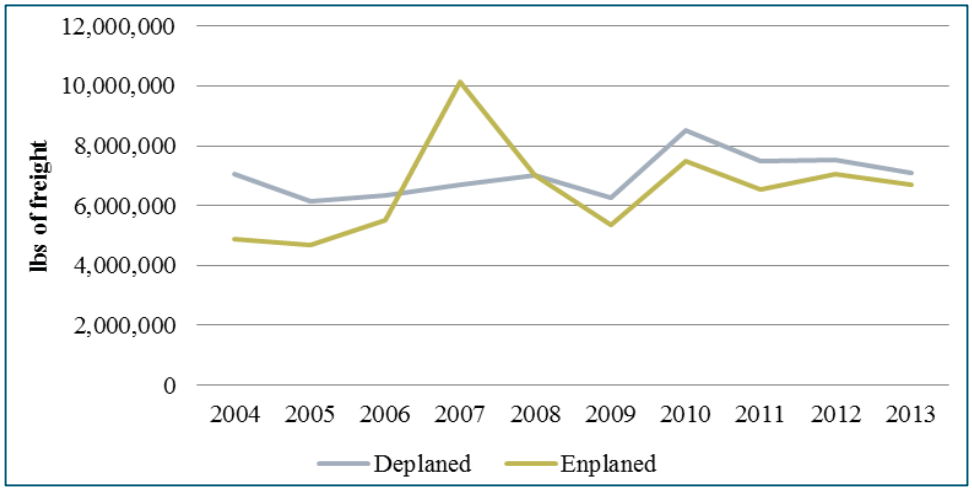

Figure 3-7 - OTZ Freight Volumes, 2004-2013
Source: RITA, 2014

As at other Alaska hub airports, freight and mail destined for outlying communities are transported to Kotzebue 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 3-8; see Table 3-9 for a summary of the aircraft types each carrier uses).

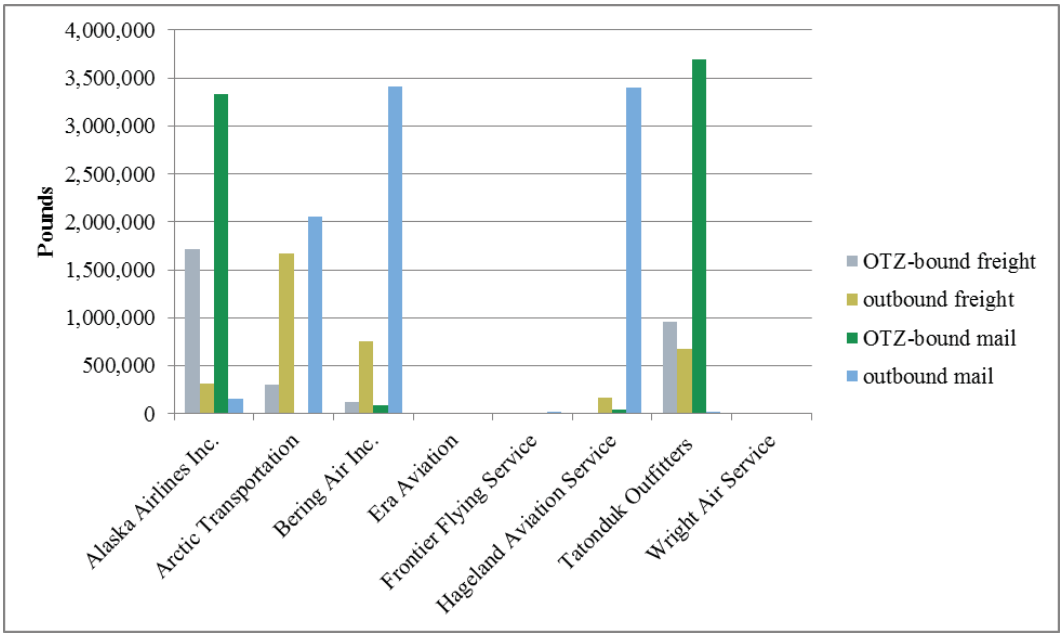

Figure 3-8 – Inbound vs. Outbound Mail and Freight by Carrier, 2013
Source: RITA, 2014

As shown in Figure 3-8, Bering Air Inc., Hageland Aviation, and Arctic Transportation deliver the majority of outbound mail to the surrounding communities, while Arctic Transportation, Bering Air Inc., and Tatonduk Outfitters carry the bulk of the outbound freight. Conversely, Alaska Airlines and Tatonduk Outfitters carry nearly all of the freight and mail to Kotzebue.

3.3.6 Air Traffic Data Collected for this Master Plan

The project team contacted ADOT&PF and reviewed flight schedules at Kotzebue Airport 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, 1998 *Kotzebue Airport Master Plan,* and NPIAS. Northern Air Cargo (NAC) and Everts Air both reported higher than average unscheduled flights in 2013.

Table 3-11 – Estimate of Aircraft Operations Based on Schedules and Contacts, 2013

Operator	Service	Scheduled Operations		Actual Operations
		Frequency	Annual	
Alaska Airlines	Air Carrier	26/week	2,704	1,936
Bering Air Inc.	Commuter	151/week	15,704	15,704
Northern Air Cargo	Air Cargo	6/week	624	774
Everts Air[2]	Air Cargo	5/week	520	632
Ravn Alaska[3]	Commuter	141/week	14,664	14,664
Military	Military Transient	---	---	1,000
Part 91 Transient	GA	---	---	11,400
Part 91 Local	GA	---	---	2,709

3.3.7 Air Traffic Base-Year Summary

Table 3-12 presents a comparison of estimated base year (2013) aviation activity at Kotzebue 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 2013 Kotzebue Airport

	Forecast Year	Based Aircraft	Enplanements	Total Operations
1998 *Kotzebue Airport Master Plan*	2008	107	74,183	80,640
2004 *Northwest Alaska Transportation Plan*	2010	NA	67,821	—
AASP	2008	52	64,944	66,642
FAA TAF	2013	52	64,126	60,000
NPIAS	2013	52	66,322	—
FAA ACAIS	2013	NA	61,274	—
Form 5010	2013	43	—	60,000
PDC Estimate	2013 (base)	43	61,274 (actual)	48,819 (actual)

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 Kotzebue and the forecast method applied.

[2] Formerly Tatonduk Outfitters
[3] Formerly Era Alaska and Hageland Aviation

3.4.1 Economic Trends Affecting the Kotzebue Airport

This section discusses economic trends affecting the Kotzebue Airport and provides a population forecast based on anticipated economic activity.

Natural Resource Development

Employment characteristics of a region or city can significantly affect the generation of air traffic. Employment opportunities drive population increases that in turn increase demand for travel. Employment activities in the NWAB have historically been closely tied to natural resource development. The Red Dog Mine has historically provided a substantial portion of the NWAB's wage and salary payroll. Although the Red Dog Mine has its own airport, regional commuter air traffic has increased as a result of its employment. Increases in natural resource development could affect the economy substantially, increasing overall demand for air travel into, out of, and throughout the region.

As of 2008, onshore and offshore oil drilling opportunities were being explored in the Hope Basin and the Selawik Basin, located offshore from the Borough in the Kotzebue Sound and the Bering Strait (2008, *Kotzebue Airport Master Plan Relocation Feasibility Study,* PDC).

However, as demonstrated in Figure 3-9, Alaska's offshore oil exploration and development opportunities are currently limited to the Beaufort and Chukchi seas and Cook Inlet. These limitations are part of the national Oil and Gas Leasing Program for 2012-2017 (Bureau of Ocean and Energy Management, 2014).

In 2008, Cominco Inc, operator of the Red Dog Mine, was working jointly with the state Division of Geological and Geophysical Surveys and the federal Department of Energy to examine the feasibility of producing gas contained in shale beds for use in powering mining and milling operations. However, no significant developments have occurred yet.

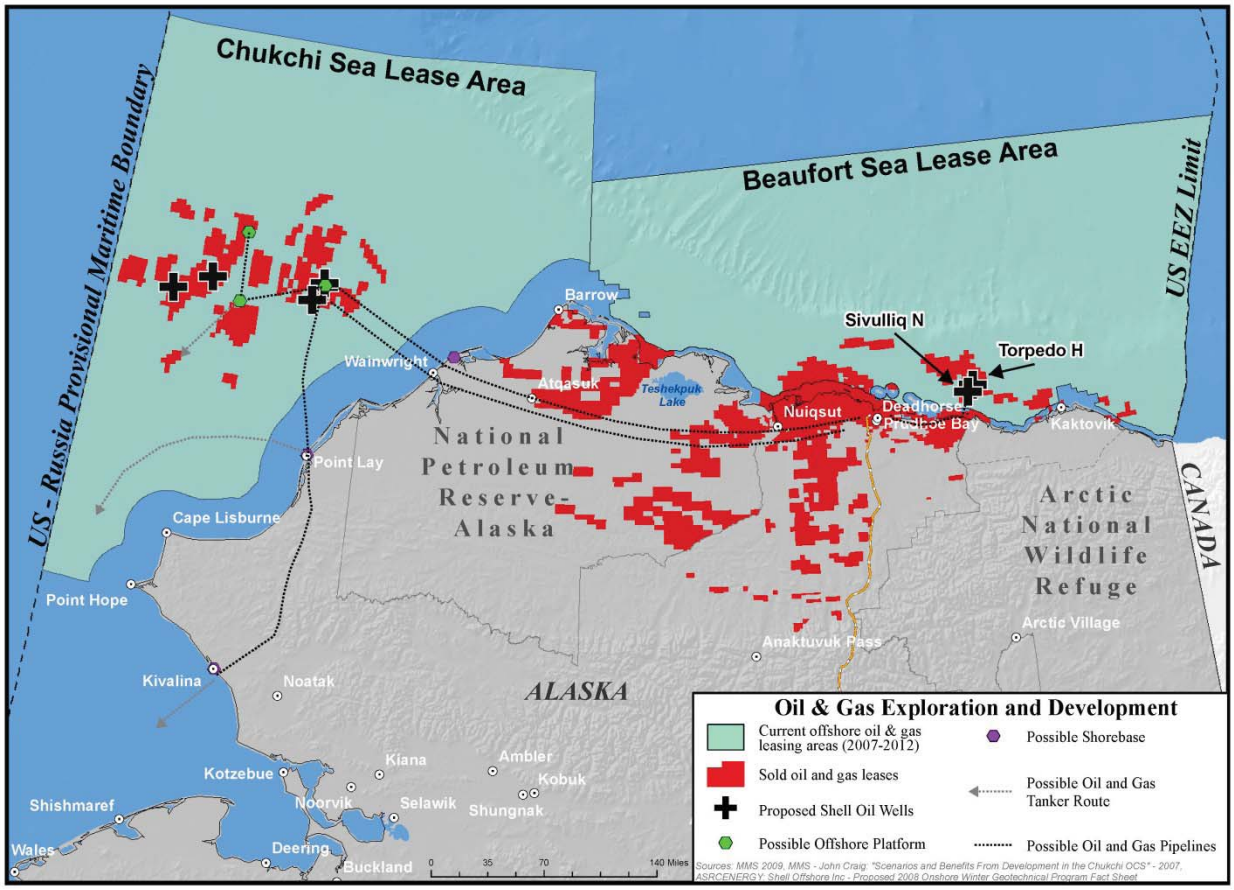

Figure 3-9 – U.S. Oil & Gas Exploration and Development Locations
Source: Shell Offshore, Inc.

Commercial fishing may have an increasing impact on the local economy. The quality of the salmon runs has improved markedly since the early 2000s. Opportunities for catching and processing have also improved. After the fishing industry nearly died in the early 2000s, a cooperative effort with the Bering Sea Fishermen's Association resulted in the opening of a fish processing operation in Kotzebue in 2004. The price per pound of Chum Salmon has also been rising with the renewed demand of the three buyers in the region: Great Pacific Seafoods, Maniilaq Services LLC, and Copper River Seafoods, who just started buying in the region in 2014. With about 80 permit holders, Kotzebue fishermen are expected to bring in about $3 million this year alone. Compared with the $7,572 produced by the fishery in 2002, the fisheries stand to make a substantial impact on the local economy (*Alaska Dispatch News*: August 23, 2014).

NAC has flown cargo and fish for the region's fisheries consistently over the last 55 years. The company reported flying 900 tons of fish from Kotzebue in 2013. 2014 has already seen that number triple, with over 2,700 tons of fish flown from Kotzebue by September. A representative from NAC explained that the company expected the recent boom in the fisheries to continue for at least the next couple of years.

Tourism

With more than 3,000 residents, Kotzebue is the largest community in the region and is the center of government and commerce in the Northwest Arctic Borough. The primary tourism assets of the Borough include its national parklands, Native culture, adventure and ecotourism opportunities, as well as its "north of the Arctic Circle" allure.

More than half of all the land within the region is federally owned and protected as parks, preserves, and wildlife refuges. The federal lands include the Noatak National Preserve, Cape Krusenstern National Monument, Kobuk Valley National Park and the Selawik National Wildlife Refuge. Additionally, the Bering Land Bridge National Preserve and the Gates of the Arctic National Park and Preserve are accessible from communities within the Borough. These public lands offer visitors unparalleled opportunities for wildlife viewing, kayaking, rafting, sport fishing and camping and feature a variety of unique archaeological sites. The National Park Service reports a recent surge of visitors to the national parks. From 2000 to 2010, visitors to the federal lands described above climbed from 6,929 to 11,584 annual visitors. In 2012, over 88,000 visitors came to these federal lands. That number dropped slightly in 2013 to 54,649, still well above the historic trend.

3.4.2 Kotzebue Population Forecast

This section looks at a demographic-based population projection for 2012–2037.

The Alaska Department of Labor & Workforce Development (DOL&WD) prepares population forecasts at the borough or census area level. The current forecast for the NWAB, covering the years of 2012 through 2037, is shown in Figure 3-10. This projection is based on births, deaths, and migrations, and does not account for economic factors.

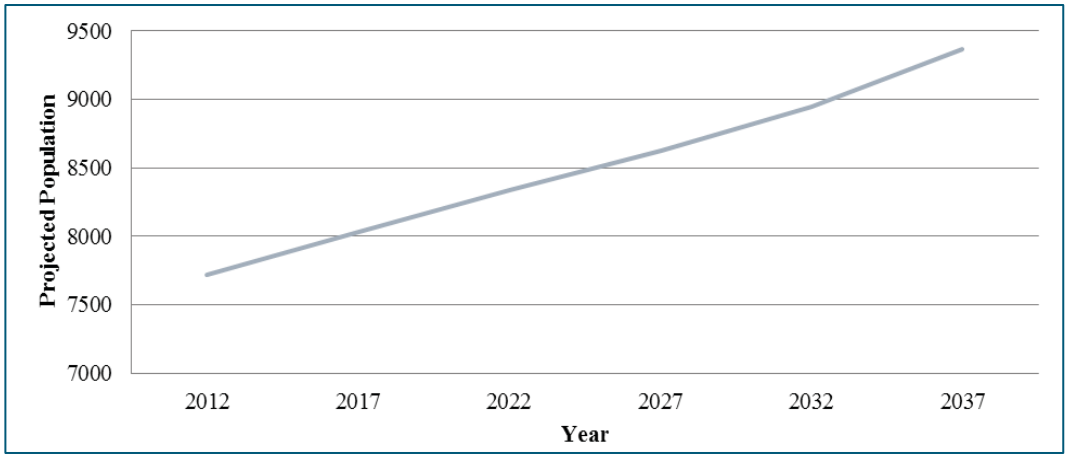

Figure 3-10 – Projected Population of the Northwest Arctic Borough, DOL&WD, 2012-2037
Source: DOL&WD (2013a)

Figure 3-11 shows the population trends of Kotzebue over the last 30 years, and projects out the next 30 years based on a continuation of the trend seen over the last 10-, 20-, and 30-year periods.

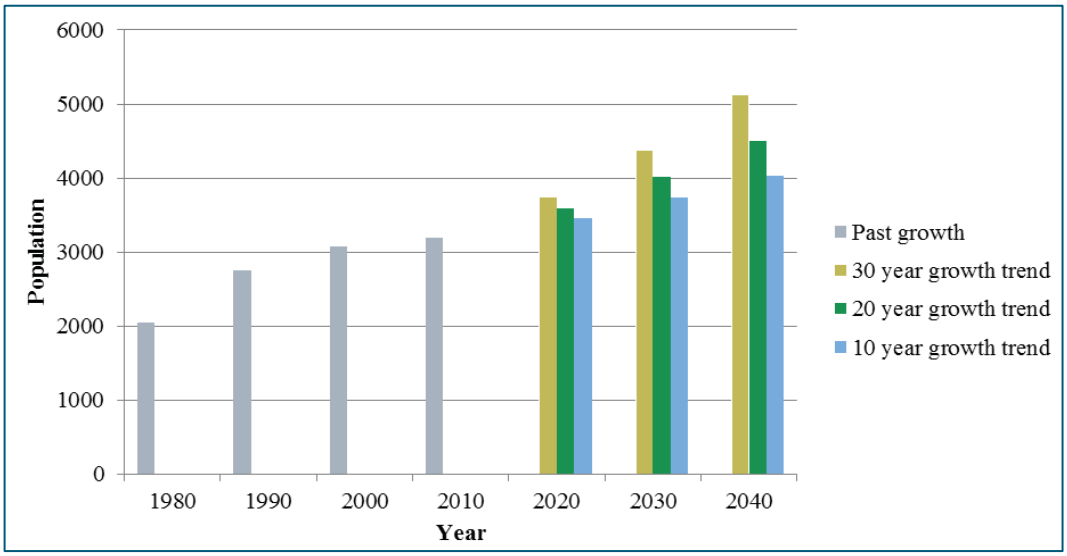

Figure 3-11 – Population of Kotzebue Projected from Growth Trends over 10, 20, and 30 Years
Source: DCRA (2013)

Projecting future growth based on the DCRA data yields an annual population growth rate that could range anywhere from 0.45% to 1.5% per year.

In June 2014, the Alaska Department of Labor and Workforce Development (DOL&WD) estimated that the population of the NWAB would grow an average of 0.8% per year for the next 30 years. This projection takes into account a number of demographic and economic factors, such as the aging baby boomer population.

3.4.3 Forecast Method

Many factors and considerations must go into developing a forecast for passenger enplanements, aircraft operations, and cargo shipments. A realistic forecast of future aviation activity at the Kotzebue airport must consider the impacts of natural resource development, economic growth, tourism, and other factors.

Growths in the fisheries and tourism—particularly at the national parks—have been identified as factors which could have a substantial impact on the economy. The following three figures illustrate the historical trend in populations and enplanements, fisheries, and visitors to the region's national parks and preserves.

Figure 3-12 compares population growth in the NWAB with enplanement trends, Figure 3-13 illustrates the trend in tons of fish shipped from Kotzebue, and Figure 3-14 illustrates the growth in the number of visitors to national parks within the NWAB.

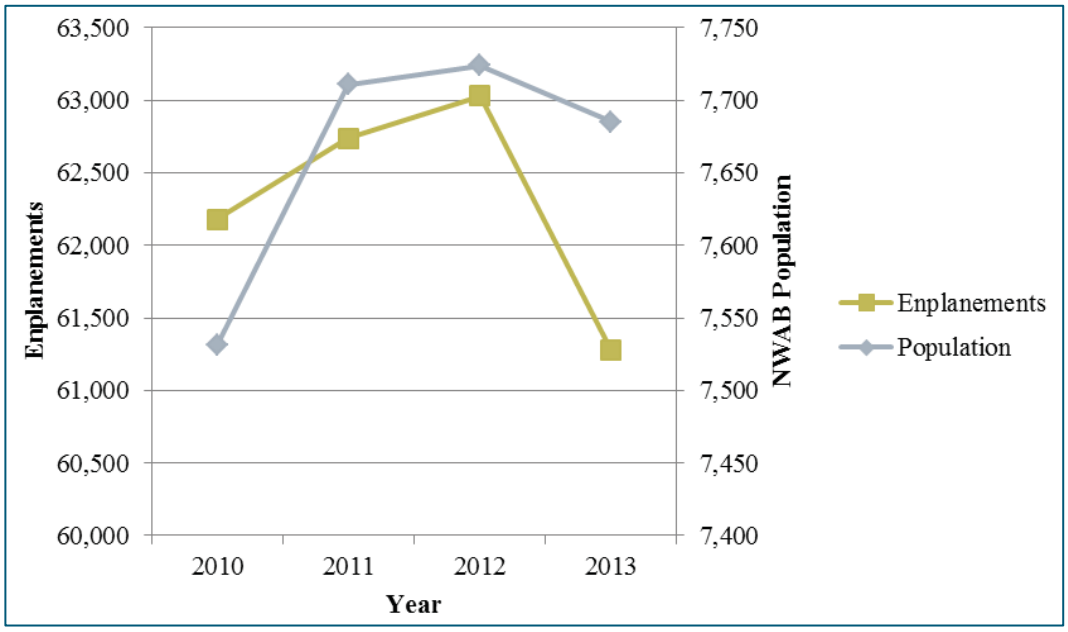

Figure 3-12 – Historical Trends in NWAB Population and Enplanements
Source: U.S. Census

Population in the NWAB trended upwards from 2010 – 2012, with a slight dip in 2013. Enplanements followed this trend with a slightly larger dip in 2013. The steeper drop in enplanements may have been affected by the slight dip in National Park visitors to the area that year. Schedule changes with the recent merger of Era, Frontier, and Hageland Aviation, and the reduction in Alaska Airlines flights to Kotzebue, may have also played a part.

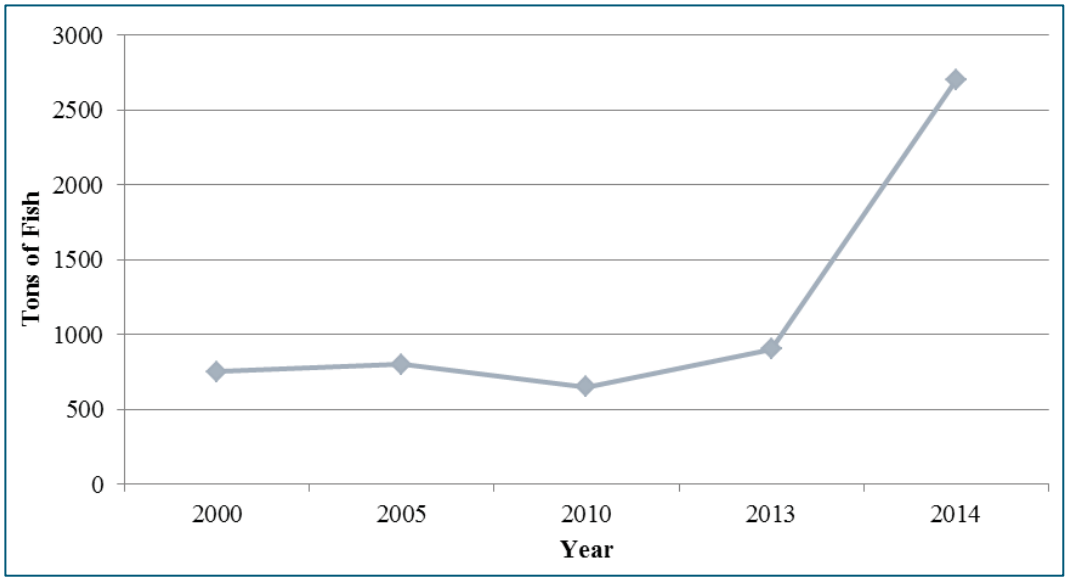

Figure 3-13 – Historical Trend in Tons of Fish Flown from OTZ
Source: Alaska Department of Fish and Game

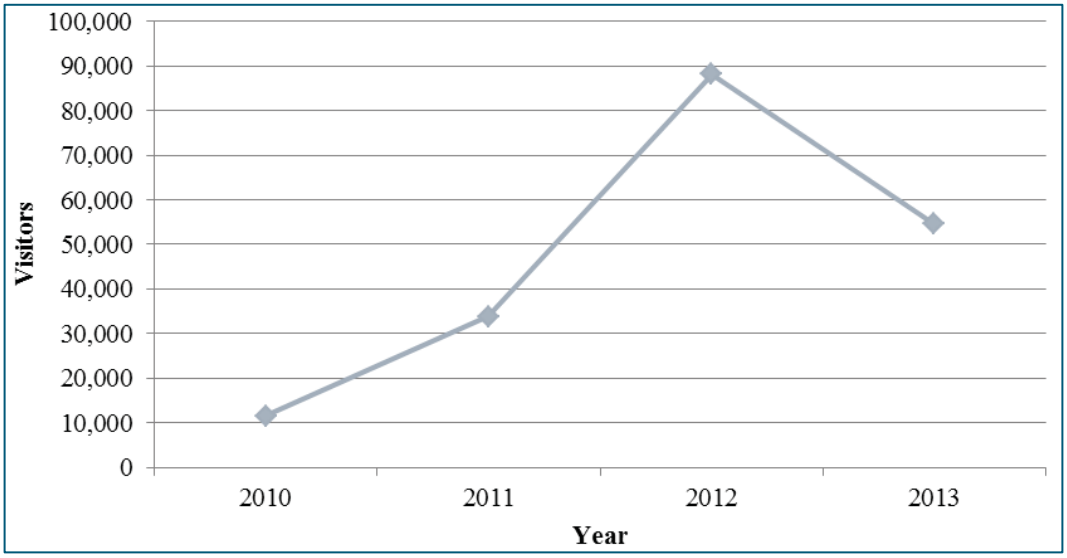

Figure 3-14 – Historical Trend in NWAB Park Visitors
Source: Integrated Resource Management Applications

While growth in the fishing industry may continue to have a substantial impact on the economy, it is unlikely that it will directly contribute to a substantial increase in flight operations or enplanements. Northern Air Cargo reported that while the weight of fish shipped from Kotzebue increased from 750 tons in the year 2000 to over 2,700 tons in 2014, the number of landings they made in Kotzebue has only increased from 307 in 2000 to 344 in 2014.

Growth in tourism to federally owned lands within the NWAB may also continue to affect Kotzebue's economy. However, while the number of visitors to the region's National Parks and Preserves has seen a major uptick over the last four years, the overall number of enplanements has actually decreased since 2011, indicating that a large number of these visitors may be coming from within the region itself.

It is more likely that any major increase in flight operations and enplanements will result from population growth, general economic trends, demographics, and migration than from the fisheries or tourism industry alone.

Based on the data collected from the DCRA, the DOL&WD, and the analysis of the fisheries and tourism industries, it is estimated that enplanements, flight operations, and aviation activity will grow at a rate of 0.9% per year over the next 20 years. This figure falls right in between the numbers collected from the DCRA and the DOL&WD above, and accounts for population, economic, migration, and industry growth factors.

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

This section applies the forecast method described above to develop air traffic forecasts for passenger enplanements, cargo, and aircraft operations for Kotzebue Airport for the next 20 years. Figure 3-15 shows the historical and forecast passenger enplanements for Kotzebue Airport. The most likely forecast is presented, as well as the Terminal Area Forecast (for comparison per FAA guidance, *Forecasting Aviation Activity by Airport*).

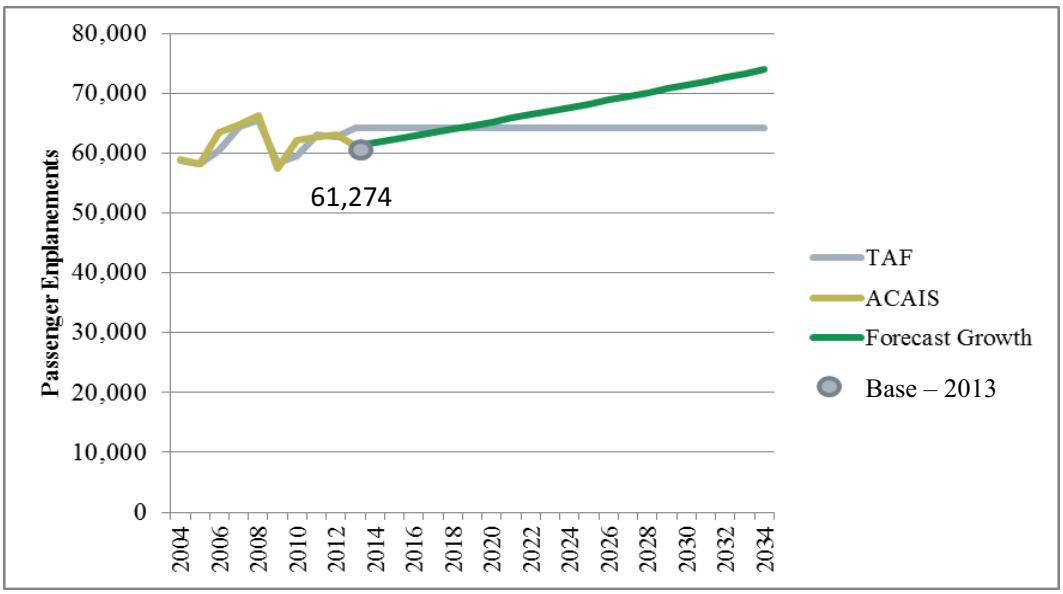

Figure 3-15 – Historic and Forecast Passenger Enplanements

Figure 3-16 shows historic and forecast cargo volumes (enplaned and deplaned) for Kotzebue Airport. Cargo includes freight and mail.

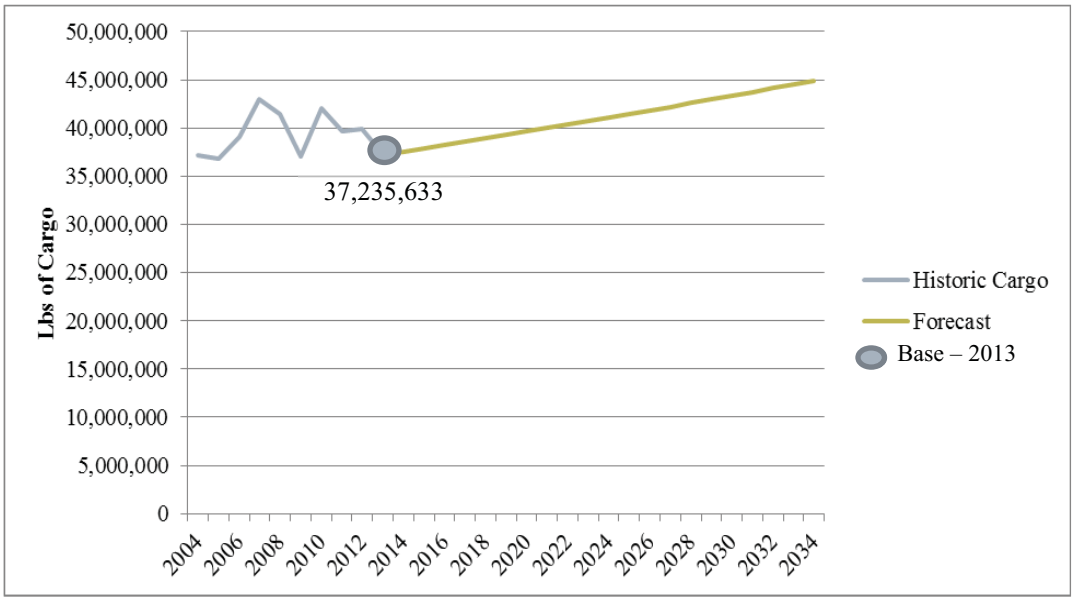

Figure 3-16 – Historic and Forecast Cargo Volumes

Figure 3-17 shows the forecasts of aircraft operations, as well as the Terminal Area Forecast. The TAF is not updated for OTZ and does not reflect actual conditions.

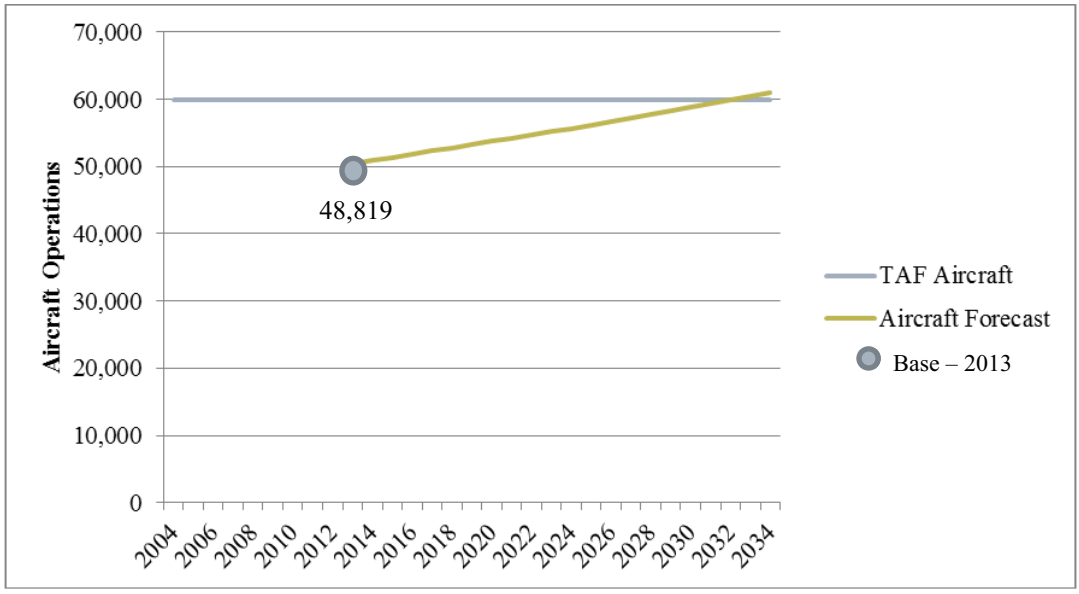

Figure 3-17 – Aircraft Operations Forecast and Historic TAF Operations

3.6 Step 7 - Compare Airport Planning Forecast Results with TAF

Table 3-13 compares the updated air traffic forecast for Kotzebue Airport (using the forecast growth rate of 0.9%) to the FAA TAF.

As mentioned previously, the TAF for OTZ is not updated often and does not reflect actual conditions at the airport. The forecast of GA operations developed for this master plan is based on discussions with FSS staff and tenants at OTZ, as well as consideration of the current number of tie-down tenants. Commercial operations are based on discussions with air taxis, air carriers, and air cargo carriers, as well as review of their published schedules.

Table 3-13 – TAF/Airport Planning Forecast Comparison

	Year	Airport Forecast (AF)	TAF	AF/TAF % Difference
Enplanements				
Passenger Enplanements	2013	61,274	62,628	-2%
	2018	64,081	64,126	0%
	2023	67,018	64,126	5%
	2033	73,299	64,126	14%
Operations				
Commercial Operations	2013	33,710	22,000	53%
	2018	35,253	22,000	60%
	2023	36,871	22,000	68%
	2033	40,326	22,000	83%
Military Operations[4]	2013	1,000	1,000	0%
	2018	1,000	1,000	0%
	2023	1,000	1,000	0%
	2033	1,000	1,000	0%
GA Operations (Local + Itinerant)	2013	14,109	37,000	-62%
	2018	14,755	37,000	-60%
	2023	15,431	37,000	-58%
	2033	16,878	37,000	-54%
Total Operations	**2013**	**48,819**	**60,000**	**-19%**
	2018	**51,008**	**60,000**	**-15%**
	2023	**53,303**	**60,000**	**-11%**
	2033	**58,204**	**60,000**	**-3%**

[4] Military operations have been consistently at this level for the last 25 years, and there does not seem to be any correlation between overall population or economic growth and growth in military flights at Kotzebue Airport.

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

The FAA approved this aviation demand forecast on January 5, 2015.

Table 3-14 - OTZ Aviation Forecast

	Base Year: 2013					Avg. Annual Compound Growth Rates			
	Base Yr.	+1 Yr.	+5 Yrs.	+10 Yrs.	+15 Yrs.	+1 Yr.	+5 Yrs.	+10 Yrs.	+15 Yrs.
Passenger Enplanements									
Air Carrier	29,579	29,845	30,934	32,352	33,834	0.9	0.9	0.9	0.9
Commuter	31,890	33,147	34,666	36,254	36,254	0.9	0.9	0.9	0.9
Total Enplanements	**61,274**	**61,826**	**64,081**	**67,018**	**70,088**	**0.9**	**0.9**	**0.9**	**0.9**
Operations									
Itinerant									
Commercial									
Air Carrier	*1,936*	*1,953*	*2,024*	*2,118*	*2,215*	*0.9*	*0.9*	*0.9*	*0.9*
Commuter/ Air Taxi	*30,368*	*30,641*	*31,759*	*33,215*	*34,736*	*0.9*	*0.9*	*0.9*	*0.9*
All-Cargo Carriers	*1,406*	*1,419*	*1,470*	*1,538*	*1,608*	*0.9*	*0.9*	*0.9*	*0.9*
Total Commercial	33,710	34,012	35,253	36,871	38,559	0.9	0.9	0.9	0.9
General Aviation	11,400	11,503	11,922	12,469	13,040	0.9	0.9	0.9	0.9
Military	1,000	1,000	1,000	1,000	1,000	0	0	0	0
Local									
General Aviation	2,709	2,733	2,833	2,963	3,099	0.9	0.9	0.9	0.9
Military	0	0	0	0	0	0	0	0	0
Total Operations	**48,819**	**49,249**	**51,008**	**53,303**	**55,698**	**0.9**	**0.9**	**0.9**	**0.9**
Based Aircraft									
Single Engine (Non-Jet)	37	37	39	41	42	0	5	5	2.4
Multi-Engine (Non-Jet)	6	6	6	7	7	0	0	17	0
Jet Engine	0	0	0	0	0	0	0	0	0
Helicopter	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total Based Aircraft	**43**	**43**	**45**	**48**	**49**	**0**	**5**	**7**	**2**

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:

- Design aircraft selection
- Facility requirements evaluation

A demand-capacity analysis is also a typical component of an airport master plan to determine any needed expansion to an airport's runway system. However, capacity has never been an issue at OTZ. The 2008 *Kotzebue Airport Relocation Feasibility Study* indicated excess capacity through the planning period, and there have been no significant changes since then. The aviation demand forecast (Chapter 3) identified 55,698 annual operations by the end of the planning period. This number is well below the FAA's capacity estimate of 195,000 annual operations for a single-runway configuration[1] such as that at OTZ. Also, the relocation study deemed neither airport relocation or major expansion—the primary means of increasing airport capacity—to be financially feasible. Within the context of the identified constraints and the current Airport Safety Area Improvements project, no additional demand-related capacity needs are expected over the planning period.

4.2 Facility Requirements

To evaluate the airport's need for facility improvements, the following must be determined:

- 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 demand

Specific alternatives for meeting demand are discussed in the following chapter.

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

[1] AC 150/5060-5, Figure 2-1

- Taxiways
- Navigational aids
- Airfield lighting, marking, and signage

Landside facilities to 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

4.2.1 Design Standards

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.

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 system has three 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, determined by the aircraft's wingspan or tail height, whichever is most restrictive. 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 third component is related to the airport's approach minimums.

The five Aircraft Approach Categories (AAC) 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 (ADG) used in airport planning are:

- **Group I:** Wingspan up to but not including 49 feet; tail height less than 20 feet
- **Group II:** Wingspan 49 feet up to but not including 79 feet; tail height 20 feet up to but not including 30 feet
- **Group III:** Wingspan 79 feet up to but not including 118 feet; tail height 30 feet up to but not including 45 feet
- **Group IV:** Wingspan 118 feet up to but not including 171 feet; tail height 45 feet up to but not including 60 feet

- **Group V:** Wingspan 171 feet up to but not including 214 feet; tail height 60 feet up to but not including 66 feet
- **Group VI:** Wingspan 214 feet or greater; tail height 66 feet up to but not including 80 feet

The six visibility categories are:

- **5000:** Not lower than 1 mile
- **4000:** Lower than 1 mile but not lower than ¾ mile
- **2400:** Lower than ¾ mile but not lower than ½ mile
- **1600:** Lower than ½ mile but not lower than ¼ mile
- **1200:** Lower than ¼ mile
- **VIS:** Visual approach only

The Airport Reference Code (ARC) is composed of the first two categories—approach speed and airplane design group. The ARC currently assigned to OTZ is C-III, and this is projected to apply through the planning period.

Design Aircraft

The current FAA guidance on airport design (AC 150/5300-13A) indicates that the design aircraft for the purposes of geometric airport design is a composite aircraft representing a collection of aircraft classified by AAC and ADG. Kotzebue Airport currently accommodates a wide variety of aircraft, including small single and multi-engine aircraft (AAC A and B and ADG I) and business turboprop and jet aircraft (AAC B, C, and D and ADG I, II, and III).

The design aircraft designation for OTZ throughout the planning period is C-III. This is based on the most demanding aircraft with over 500 operations at OTZ, which is currently the 737-400. Alaska Airlines is phasing out the 737-400 and expects to transition to the 737-700 for passenger service to Kotzebue by 2016 (Craig, personal communication). The 737-700 is also a C-III aircraft.

4.2.2 Airside

Runways

Runway Design Code

The selected AAC, ADG, and approach visibility minimums are combined to form the Runway Design Code (RDC) of a particular runway. An airport with multiple runways, such as OTZ, can have different RDCs for each runway. The primary runway at Kotzebue (9-27) has an RDC of C-III-4000. The crosswind runway (18-36) has an RDC of B-II-VIS.

Crosswind Runway

The FAA guidance recommends that a runway provide 95% or better wind coverage for the design aircraft. The current ALP shows that the primary runway (9-27) provides 93% wind coverage for C-III aircraft, which is slightly below the FAA recommendation. The combination of primary and crosswind runways provides 95% wind coverage for B-II aircraft.

The crosswind analysis for the current ALP used data from 1987 or earlier. It is recommended that more recent wind data be analyzed to determine if the wind coverages are still the same.

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. 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 Taxiway Design Group (TDG) specifies different criteria than the Aircraft Design Group. The TDG is based on the design aircraft's landing gear characteristics. This is because the landing gear dimensions dictate how an airplane will track around corners. The design aircraft for Kotzebue are the Boeing 737-400 (near-term) and the 737-700 (mid- and long-term). The TDG for these aircraft is TDG 3. These aircraft use Taxiways C, D, and E.

Taxiways A, B, and F accommodate smaller aircraft such as the Beechcraft 1900 and are classified as TDG 2.

Taxiway Geometry

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

- Avoid "high energy" intersections. These are intersections in the middle third of the runway, the area where a pilot has the least freedom to 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.
- Aligned taxiways are prohibited. An aligned taxiway is one whose centerline coincides with a runway centerline, which can cause a loss of situational awareness by a pilot.

According to these recommendations, OTZ has the following deficiencies:

- Taxiway E intersects Runway 9-27 in the middle third of the runway.
- Taxiways C, D, and E lead directly from an apron to the runway
- Taxiway F is nearly aligned with runway 18-36

Parallel Taxiways

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

However, OTZ is severely constrained by water and construction costs are very high due to the lack of readily available material. These factors make a full-length parallel taxiway impracticable during the planning period.

Pavement

As noted in Chapter 2, Runway 9-27 was repaved and rehabilitated in 2012 and is currently in good condition. For this runway, only preventative maintenance is recommended and will be periodically evaluated through the ADOT&PF pavement management program. Taxiways C, D, E, and F are being rehabilitated and widened as part of the current runway rehabilitation project. However, dips and rough surfaces have been noted on some of the ramp surfaces by airport M&O staff. Additionally, there is an unpaved strip between taxiway B and adjacent lease lots that causes stones and dust to be blown onto lease lots by taxiing aircraft.

Navigational Aids

The navigational aids at Kotzebue Airport include an ILS that supports a Category I instrument approach for Runway 9. No change is planned to meet Category II instrument approaches, as this would require an air traffic control tower and approach lighting.

The localizer/DME is offset from the runway centerline, resulting in a slight offset to the ILS approach. This functions adequately as-is, and no relocation of this equipment is planned.

Other navigational aids currently in use at Kotzebue will remain, including the electronic navaids (VOR, NDB, RVR) and visual aids (segmented circle, runway lighting, REIL).

Airfield Lighting, Marking, and Signage

Kotzebue is currently using Visual Approach Slope Indicator (VASI) lights as the Visual Guidance Slope Indicators (VGSI) for Runway 9-27. With the change in the threshold locations as part of the current RSA project, the VGSI also needs to be relocated, and the FAA is currently replacing the VASI lights with PAPI lights. Until the new system is commissioned (expected in summer 2015), the FAA has restricted the night landings on Runway 27 due to penetration of the 20:1 approach surface.

Marking and signage along taxiways and runways currently meets all needs and FAA standards. With changes in taxiway geometry, both marking and signage will have to be updated, as per FAA guidance in AC 150/5340-1L and AC 150/5340-30.

Airfield Standards and Deficiencies

The appropriate design standards by ARC are specified in FAA AC 150/5300-13A, *Airport Design*. Table 4-1 outlines the key dimensional standards for Kotzebue. Values in ***red italics*** indicate deficiencies. Airside facility needs are based upon comparing the FAA standards with the existing conditions at Kotzebue.

Table 4-1 - Runway and Taxiway Geometric Standards

Airfield Components	Existing		Standards	
	9-27 (C-III)	18-36 (B-II)	9-27 (C-III)	18-36 (B-II)
Runway Design				
Width (ft.)	150	90	150	75
Shoulder Width (ft.)	25	10	25	10
Blast Pad Width (ft.)	200	*0*[2]	200	95
Blast Pad Length (ft.)	200	*0*[2]	200	150
Runway Safety Area				
Width (ft.)	*340*	*120*	500	150
Length Prior to Landing Threshold (ft.)	*400*	*0*	600	300
Length Beyond Departure End (ft.)	*400*	*240*	1,000	300
Runway Object-Free Area (ROFA)				
Width (ft.)	800	*150*	800	500
Length Beyond Runway End (ft.)	1,000	300	1,000	300
Length Prior To Landing Threshold (ft.)	600	300	600	300
Approach Runway Protection Zone (RPZ)				
Length (ft.)	1,700	1,000	1,700	1,000
Inner Width (ft.)	1,000	500	1,000	500
Outer Width (ft.)	1,510	700	1,510	700
Departure Runway Protection Zone (RPZ)				
Length (ft.)	1,700	1,000	1,700	1,000
Inner Width (ft.)	500	500	500	500
Outer Width (ft.)	1,010	700	1,010	700
Runway Separation				
Parallel Taxiway/Taxilane (ft.)	490	N/A	400	240
Aircraft Parking Area (ft.)	500	*<250*	500	250
Taxiway Protection				
Taxiway Safety Area (ft.)	120	100	118	79
Taxiway Object Free Area (ft.)	186	>131	186	131
Taxilane Object Free Area (ft.)	162	115	162	115
Taxiway Design Group (TDG)	3	2[3]	3	2
Width (ft.)	≥50	50	50	35
Edge Safety Margin (ft.)	10	7.5	10	7.5
Shoulder Width (ft.)	20	>15	20	15

As shown in the table, the primary runway does not have standard runway safety areas. See Chapter 2 for a discussion on the history of the RSA development.

[2] Per AC 150/5300-13A, blast pads are not required for runways accommodating ADG-I and II aircraft
[3] TDG 2 applies to Taxiways A, B, F

4.2.3 Landside

Landside considerations include aprons, passenger terminal buildings, cargo facilities, hangars, security, and support facilities. Landside facility requirements come from a variety of sources including FAA standards, ADOT&PF requirements, and user needs.

Apron Requirements

Apron space requirements, other than transient aircraft parking, are not defined by FAA. Existing apron space at OTZ is summarized in Table 4-2.

Table 4-2 - Apron Areas

Airport Area	Square Yards (Approximate)
GA Tie-Downs (North)	7,000
GA Tie-Downs (South)	14,000
Transient Aircraft Parking	1,200
Block 1, Lots CD, EG, HI	9,400
Block 2	20,250
National Guard Apron	4,000

Commercial Apron Area

Of all the apron areas, the area in front of Lots CD, EG, and HI of Block 1 is the most congested. This is due to the prevalence of large aircraft parking in front of the FBX and Alaska Airlines terminals. At busy times, there can be up to three large jet aircraft—NAC 737-200, Alaska Air 737-700, and Everts DC-9—on the apron at once. Because of the limited space on the apron, Alaska Airlines restricts the use of its 737-800 aircraft at Kotzebue.

Alaska Airlines is the only Part 121 operator at OTZ. Although FAA guidance recommends a minimum of two aircraft parking positions for Part 121 carriers, Alaska Airlines has only one hardstand at OTZ. As Alaska Airlines has no plans to fly more than one jet to Kotzebue at a time, however, this single hardstand is sufficient for the planning period.

Transient Aircraft Aprons

Parking for large or turbine-powered aircraft is limited to the apron area in front of the ARFF building. Smaller planes park along Runway 18-36 or in the north tie-down area. Typical transient aircraft include single and twin-engine aircraft such as Cessna 206/207, Piper Navajo, and DHC Twin Otters. Occasionally, a private jet will land at OTZ. Transient helicopters will occasionally use OTZ. They also park on the apron in front of the ARFF building.

The largest transient aircraft that regularly lands at OTZ is the DHC Twin Otter, which has a wingspan of 65 feet. FAA AC 150/5300-13A, Appendix 5, recommends approximately 520 square yards of apron space for an aircraft with dimensions similar to those of the Twin Otter.

In summary, apron space for transient aircraft is adequate for the planning period. However, the location in front of the ARFF is not ideal and has resulted in transient pilots and passengers walking through secure areas. That location is also less than 500 feet from the runway centerline, the separation distance required under AC 150/5300-13A. A new parking area for transient aircraft should be established and provided with a dedicated access point with electronic controls. Additionally, helicopters should have dedicated apron space separate from fixed-wing operations.

GA Aprons

GA apron space is located in two separate areas:

- Adjacent to Runway 18-36
- Adjacent to taxiway B in Block 3 of the terminal area

With 37 based GA aircraft and the forecast addition of 5 more GA aircraft, the amount of apron space currently available is adequate. However, the tie-downs along Runway 18-36 are within 250 feet of the runway centerline and do not meet FAA separation requirements. Additionally, ADOT&PF Aviation Leasing reported that the 12 tie-down spaces in Block 3 are often full and in greater demand than the spaces along Runway 18-36. This is likely due to the security afforded by being behind the airport security fence.

Passenger Terminal Building

Kotzebue has three primary passenger terminals, operated individually by Alaska Airlines, Bering Air, and Ravn Alaska. Alaska Administrative Code (AAC) Title 17 does not dictate passenger terminal requirements; thus it is up to the airport tenants to develop a facility that accommodates passenger demand. Discussions with airport tenants did not indicate any plans for passenger terminal expansions during the planning period.

Cargo

The primary cargo carriers are Alaska Airlines, Northern Air Cargo, Ravn Alaska, Bering Air, Everts Air, and Lynden Transport. Northern Air Cargo, Everts, and Lynden utilize the FBX facilities for cargo while Alaska Airlines, Bering Air, and Ravn each maintain their own facilities.

Preliminary sizing of OTZ cargo facilities was calculated using the Total Area Ratio (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 sf of building space per ton of cargo per year. 18,618 tons of cargo passed through Kotzebue in 2013. This equates to the IATA required cargo space of 20,480 sf. Cargo is projected to increase to 22,472 tons of cargo by 2034, resulting in a need for a total of 24,719 sf of cargo space (an increase of 4,240 sf). Kotzebue's current cargo space is 25,000 sf, and should be adequate for the planning period.

Table 4-4 - Square Footage of Cargo Space

	Existing	Need		
		Short-Term	Intermediate	Long-Term
Building Space (sf)	25,000	18,600	20,800	23,400

Aircraft Hangars

The demand for hangar facilities typically depends on the number and type of aircraft expected to be based at the airport as well as the regional climate. Hangar facilities are generally classified as conventional hangars or T-hangars. Conventional hangars can include individual hangars or multi-aircraft hangars. These different types of hangars offer varying levels of privacy, security, and protection from the elements. There are eight conventional hangars at OTZ. Presently, there are no existing T-hangars for general aviation at OTZ.

Forecasted aviation activity indicates that OTZ could see 49 based aircraft by the end of the planning period. As the number of based aircraft at OTZ increases, the demand for hangar space will increase. During site visits, interest was expressed in the development of hangars and the related support facilities. All hangars should be located to provide adequate access to auto parking in addition to fuel and airside facilities.

Lease Lots

There has been no significant demand for lease lots at the Kotzebue Airport. Therefore, the present capacity is considered adequate for the duration of the planning period.

Support Facilities

ARFF/SREB

The aircraft rescue and firefighting facilities at Kotzebue 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. Therefore, the ARFF index is not anticipated to change during the planning period.

Airport Maintenance

M&O staff and the airport manager reported that sand storage is insufficient for current and future needs. The airport nearly exhausted its supply the last two winters. An increase of at least 50% in sand storage capacity is recommended over the planning period.

There is currently an unpaved strip remaining between the paved apron and taxiway in front of Ravn Alaska's facilities. Ravn employees have cited gravel tracked onto the paved surfaces as a potential problem. This strip should be paved during the planning period.

Pilots have mentioned potential hazards during takeoff from birds on the ponds south of Runway 18-36. Further study and consideration of filling these ponds is recommended.

FAA has non-functioning equipment adjacent to the access road to Runway 18-36. During the winter, the equipment causes deep snow drifts and, if left, could create environmental hazards from metal leaching. This equipment should be removed.

Equipment identified by airport staff as needing replacement over the planning period include:

- A new loader to replace the 19-year-old Caterpillar 966
- A new deicing truck with greater capacity
- A new bulldozer to replace the 24-year-old Case 1150E
- An additional grader and plow truck
- A pump and plumbing for the deicer storage tank, which must currently be filled manually and gravity-dispensed

Airport management also requested an additional equipment bay with metal runners on the west end of the SREB to hold the bulldozer and additional equipment.

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). Kotzebue Airport meets this criterion and is therefore required to switch to a non-urea-based runway deicing agent for all deicing activities. This new deicing agent requires storage space for the chemicals and for a dedicated dispensing vehicle. Kotzebue Airport has sufficient storage facilities for these deicing agents in three M&O buildings built in the last 10 years.

Aircraft Maintenance

There are no aircraft maintenance shops at OTZ that provide services outside their own company. Air taxis operating from Kotzebue have mechanics that work on their aircraft. Due to the small GA presence in Kotzebue, a fixed base operator offering aircraft maintenance services is not likely financially feasible.

Utilities

Analysis and conversations with airport personnel indicate that utilities at Kotzebue Airport are adequate, and no major updates are suggested over the planning period.

Airport Security and Fencing

For Part 139 certificated airports, the operator (ADOT&PF) must have an Airport Security Program. For the Kotzebue 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 OTZ:

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

Kotzebue Airport has two SIDAs, one on the Alaska Airlines apron and one in front of the FBX facility. Unless one of the cargo carriers decides to build a separate facility, these SIDAs are adequate for the planning period.

Security fencing on the north side of the airport extends from Lot 6A on the edge of Kotzebue Lagoon west to the shoreline of Kotzebue Sound. There are radio-controlled gates that block vehicle access around the Runway 9 threshold while aircraft are on final approach. When there are no aircraft on final approach to Runway 9, the gates are open and vehicles can drive around the west end of the runway. Fencing on the south side of the airport is limited to the west end of Runway 9-27.

Access gates to lease lots and apron areas are secured with lock and key. Airport tenants are responsible for keeping gates locked and maintaining possession of ADOT&PF-issued keys. An electronic gate system would provide ADOT&PF more control over authorized access.

The regional aviation manager for ADOT&PF indicated a need for dedicated access to the transient aircraft parking area. This would eliminate the chance of transient pilots wandering through secure areas while looking for an exit.

Airport management requested that the security fence enclose the sand storage building in order to give maintenance staff direct access to the airport and runway, enclose the airport's sand-making operation, and open up more of the new GA parking area, which will make plowing snow easier and more efficient.

Ground Access, Circulation, and Parking

There are no designated parking areas in the terminal area. Private vehicles park in front of each carrier's terminal building.

AC 150/5360-9 indicates that an airport with 61,274 enplanements should have approximately 110 public parking spaces. For the forecast 70,088 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 to long-term parking.

Because of the close proximity of the airport to the community, Kotzebue Airport does not require any long-term parking. Therefore it is reasonable to suggest that OTZ requires fewer parking spaces than suggested by the AC. For short-term parking, OTZ should need only 28 parking spaces now and 31 by the end of the planning period.

The terminal parking area can accommodate the recommended 31 parking spaces. However, the parking area does not currently have striped parking spots, which leads to inefficient parking. Additionally, the area in front of the Alaska Airlines terminal is often congested when the daily flights arrive.

Land Requirements

Kotzebue Airport is located on an irregularly shaped parcel of 1,805 acres to the south of the City of Kotzebue. The bulk of the airport property is water, and expansion of facilities often requires fill. Due to these constraints, significant expansion or relocation has been determined to be problematic (see the 2008 *Kotzebue Airport Relocation Feasibility Study*). The existing acreage is deemed adequate for the facilities needed through the 20-year planning period.

4.2.4 Other Items of Concern

Float Plane Facilities

There are no official float plane facilities or marked water lane at OTZ. Pilots currently land on Kotzebue Lagoon but have expressed interest in a freshwater float pond with launch ramp.

A formal float pond with launch ramp and floatplane parking was called for on Isaac Lake in the preferred alternative of the 1998 Master Plan Update. Isaac Lake is periodically pumped down to extract gravel. Formal study and development of dedicated float plane facilities should be considered.

4.3 Findings

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

Facility deficiencies (shown on Figure 4-1) include:

- Taxiway geometry concerns
- Lack of dedicated float plane facilities
- Aircraft parking too close to Runway 18-36
- Transient aircraft parking concerns
- Substandard safety areas for Runway 18-36

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

- Realignment of Taxiways E and F
- Development of designated floatplane facilities
- Expansion/relocation of dedicated transient aircraft parking
- Additional tie-downs in the terminal area
- M&O facility expansion

1. Preventative maintenance needed on apron
2. Commercial apron expansion needed
3. Taxiway connects with middle third of runway
4. No security fence south of runway 9/27
5. No dedicated float pond facilities
6. GA parking too close to runway centerline
7. Additional equipment bay needed
8. Direct access between apron and runway
9. Discarded equipment causing drifts and leaching
10. 50% increase in sand capacity needed
11. Transient aircraft parking too close to runway centerline
12. Sub-standard RSA for runway 18/36

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KOTZEBUE AIRPORT MASTER PLAN UPDATE
FACILITY DEFICIENCIES

Aerial photograph taken October, 2014

DESIGN:	BWH
DRAWN:	BWH
CHECK:	PWC
12/9/14	

Figure No.
4-1

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5 Alternatives

The previous chapter identified Kotzebue Airport's deficiencies based upon the current FAA guidance and the forecast of aviation demand. This chapter:

- Identifies alternative ways to address the identified facility requirements
- Evaluates those alternatives, individually and collectively, to determine each's strengths, weaknesses, and implications
- Presents a preferred alternative

5.1 Alternative Development Process

Developing alternative concepts is an iterative process that incorporates feedback from ADOT&PF, FAA, stakeholders, and the public. Preliminary concepts are based on several *primary elements* that were identified during the inventory (Chapter 2) and the facility requirements (Chapter 4) phases.

Primary elements generally require large, contiguous land areas. The primary elements for OTZ and the deficiencies that they address are outlined in the table below. Once the primary elements have been accommodated, then any remaining deficiencies can be addressed.

Table 5-1 - Primary Alternative Elements

Primary Element	Deficiency Addressed
Airside	
Taxiway geometry changes	FAA standards
Landside	
Tie-down expansion/relocation	User demand/FAA standard
Transient aircraft parking relocation	FAA standard

5.1.1 Concepts Dropped from Further Consideration

Several alternative concepts and components were dropped from further consideration due to economic limitations. These concepts have been studied extensively in recent years, as documented in the following reports:

- 1998 Kotzebue Airport Master Plan Update
- 2008 Kotzebue Airport Relocation Feasibility Study
- 2012 Final Environmental Assessment, Kotzebue Airport Safety Area Improvements – Stage III
- 2013 Supplemental Environmental Assessment, Kotzebue Airport Safety Area Improvements – Stage III

Airport Relocation

Airport relocation has been thoroughly investigated by previous studies (1998 master plan, 2008 relocation study) and deemed economically infeasible.

Full-Length Parallel Taxiway

While a full-length parallel taxiway is recommended per FAA guidance for OTZ, it was dropped from further consideration due to the high cost associated with construction in the Kotzebue Lagoon.

Runway Lengthening

Lengthening the primary runway was studied extensively during the Runway Safety Area (RSA) project and the practicability study completed under that project ultimately determined that lengthening the runway was economically infeasible.

5.2 Alternative Concept Descriptions

The following section describes the alternative concepts that were developed to remedy current and projected airport deficiencies. The initial concepts were presented to the public and stakeholders at a series of meetings held in Kotzebue on January 28, 2015.

Public comments included:

- Concern about vehicle parking and safety in front of the Alaska Airlines terminal
- Potential uses of airport land in the northeast corner of the terminal area
- The need to coordinate any future airport construction with the local utility
- How to accommodate expansion of the Alaska Airlines terminal (if Alaska Airlines were to consider expansion)

The ADOT&PF and consultant team held two work sessions - one on February 3, 2015, and one on February 12, 2015 - to evaluate and refine the concepts. Key refinements included developing an option for relocating the tie-downs to the east end of the apron and accommodating an air carrier-sized lease lot in the northeast corner.

5.2.1 Airside Development Concepts

All other airport functions (e.g., aircraft parking, access roads, security) relate to and revolve around the basic runway-taxiway layout. This means that airside development alternatives must be examined carefully and thoroughly.

Since large-scale reconfiguration or expansion of the runways is economically infeasible, airside concept development focused on improving the configuration of the taxiways.

Taxiway E Realignment

Two aspects of Taxiway E are out of compliance with FAA standards (as identified in Chapter 4 – Facility Requirements):

- It connects into the middle third of the runway, a "high energy" area where FAA discourages taxiway intersections
- It connects to the runway at an acute angle, instead of the 90° angle recommended by FAA guidance

Realigning Taxiway E to intersect with Runway 9-27 at a 90° angle will both satisfy the intersection angle requirement and shift the intersection out of the middle third of the runway.

Figure 5-1 – Taxiway E Realignment

Taxiway F Realignment

Taxiway F is essentially aligned with Runway 18-36, which is undesirable as it can be confusing to pilots approaching that runway. Replacing Taxiway F with a new Taxiway J that connects to the north end of Runway 18-36 at a 90° angle and then travels northeast to connect to Runway 9-27 will eliminate this condition.

Figure 5-2 – Existing Taxiway F and Proposed Taxiway J

5.2.2 Landside Development Concepts

Apron Expansion

Apron expansion is needed to accommodate the relocation of transient aircraft parking, meet demand for additional tie-downs, and provide for future leasing opportunities. The northeast corner of the terminal area is the focus of this expansion, as it is currently undeveloped airport property. All of the apron expansion alternatives include expansion of the ADOT&PF sand storage facility to double its storage capacity, provide new lease lots, relocate transient parking to this apron, and expand security fencing around the proposed expansion.

Option 1

- Construct a TDG 2 taxiway connecting the existing apron to the undeveloped northeast area
- Relocate the existing tie-downs to the extreme northeast corner of the apron
- Convert the vacated tie-down area to a new lease lot
- Relocate transient aircraft parking to the northeast apron area
- Designate two new lease lots adjacent to the northeast corner of the existing apron
- Construct new access roads and security fencing around the northeast apron

This option for apron development moves the tie-down area away from the commercial operators, provides dedicated space for transient aircraft parking, and offers the ability to designate three new lease lots.

Figure 5-3 – Apron Expansion Option 1

Option 2

- Relocate transient parking to the northeast edge of the proposed apron
- Relocate and expand the existing tie-downs to the east end of the existing apron
- Construct a TDG 3 taxiway connecting the existing apron to the northeast apron area
- Convert the vacated tie-down area to a new lease lot
- Construct new access roads and security fencing
- Designate five new lease lots, one of which is sized to accommodate a Part 121 operator

Option 2 provides an area for development of an air carrier-sized lease lot and accompanying TDG 3 taxiway, as well as additional leasing opportunities.

Figure 5-4 – Apron Expansion Option 2

Option 3

- Expand the existing tie-down area
- Construct a new TDG 2 taxiway connecting the existing apron to the proposed apron
- Construct new access roads and security fence
- Relocate transient aircraft parking to the proposed apron area
- Designate five new lease lots

This option for apron development expands the existing tie-down area, relocates the transient parking, and offers the potential for additional lease lots.

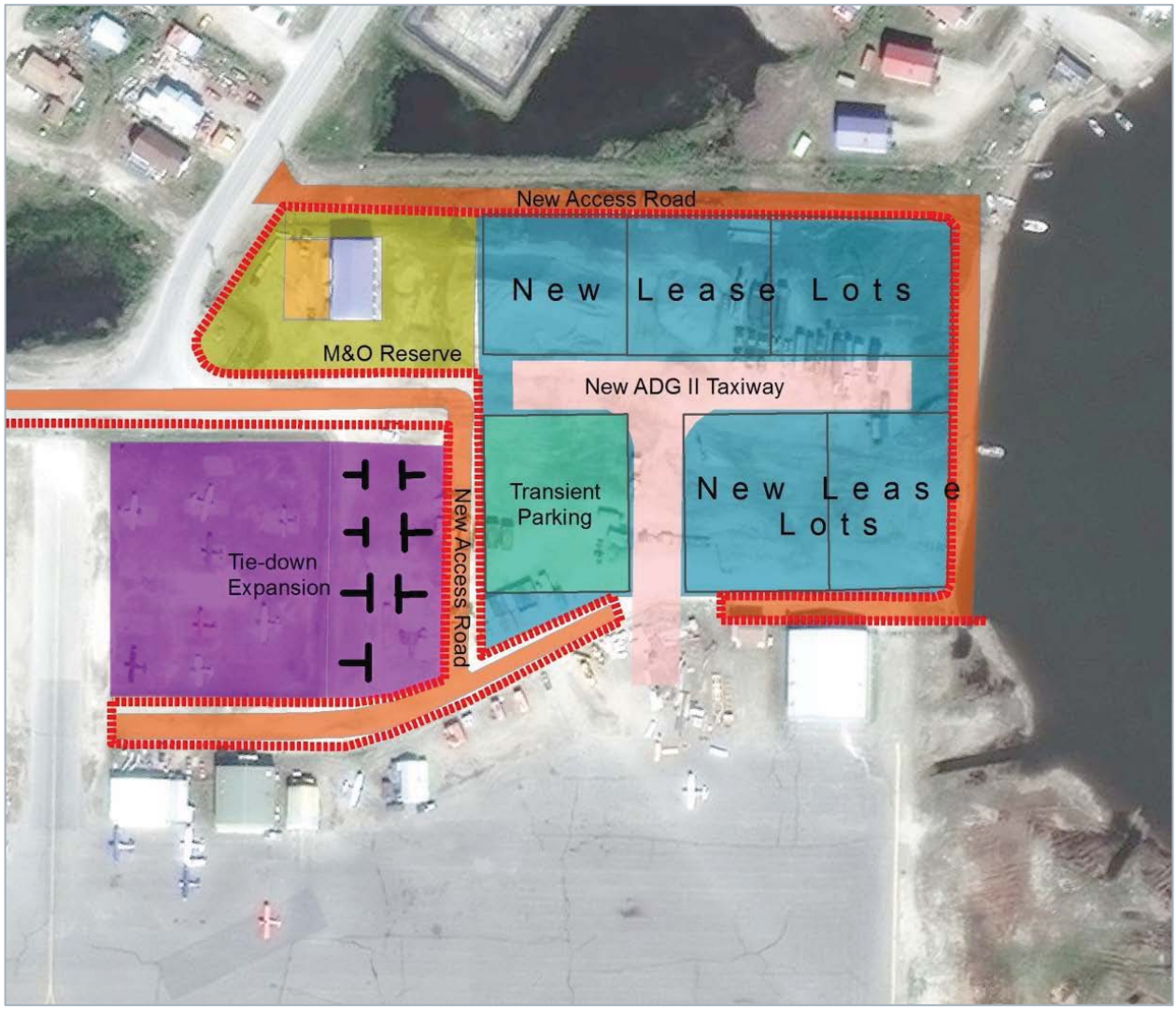

Figure 5-5 – Apron Expansion Option 3

Crosswind GA Facilities

There are two primary deficiencies with the general aviation facilities associated with the crosswind runway:

- The tie-downs along Runway 18-36 are within 250 feet of the runway, which is too close per FAA guidance
- There are no formal floatplane facilities

Formal float facilities with launch ramp and aircraft parking have been desired at Kotzebue for some time. The 1998 AMP update included two alternatives for floatplane facilities, which remain valid today:

- Acquire Isaac Lake and develop floatplane facilities
- Develop floatplane facilities on Kotzebue Lagoon

Three options were developed to satisfy the demand for floatplane facilities and relocate the GA tie-downs.

Option 1

- Construct a gravel apron with space for 30 tie-down positions in the area between the two runways
- Develop a launch ramp and float pond slips within a sheltered anchorage area 500 feet northeast of the north end of Runway 18-36
- Construct a vehicle access road

Option 1 places the tie-downs and floatplane facilities off the northeast end of Runway 18-36, in the triangular area between the two runways. Therefore, it could only be implemented if Taxiway F is relocated as Taxiway J.

Figure 5-6 – Crosswind GA Option 1

Option 2

- Construct a gravel apron with space for 30 tie-downs
- Add a float plane launch ramp and slips on Kotzebue Lagoon (two options)

This second option for GA facilities is centered on the area between Runway 18-36 and the USFWS hangar and apron area. Access to the new apron would be via the existing Taxiway G. Floatplane facilities could be located on either the north or south end of the tie-down development, to be determined during design.

Figure 5-7 – Crosswind GA Option 2

Option 3

- Construct a gravel apron with 30 tie-down spaces
- Construct a connecting taxiway
- Acquire KIC parcel encompassing Isaac Lake
- Dredge and mark Isaac Lake
- Develop floatplane ramp and slips along Isaac Lake

This option is twofold: construct GA tie-downs near the south end of Runway 18-36 and acquire Kikiktagruk Iñupiat Corporation (KIC) land to develop Isaac Lake as a formal float pond.

Figure 5-8 – Crosswind GA Option 3

5.3 Alternatives Evaluation

The consultant team and ADOT&PF met on February 3, 2015, to evaluate the two taxiway and six alternatives presented above (three for apron expansion and three for GA facilities along the crosswind runway). Airside alternatives were compared against the no-build alternative, while the landside alternatives were compared against both the no-build alternative and each other. The group rated each alternative using 27 criteria in five categories—safety, function/ engineering, environmental impacts, best planning tenets, and fiscal factors—as well as discussing the pros and cons of each alternative in order to select a preferred alternative.

The preferred alternative incorporates both airside alternatives along with Apron Expansion Option 3 and Crosswind GA Option 2. These two landside options were most favorable based on:

- Lower construction and M&O costs
- Fewer impacts to airport users and tenants
- Ability to phase construction

The preferred alternative was subsequently refined to accommodate a 90,000 sf lease lot with apron frontage in the northeast corner. This large lease lot could accommodate a terminal for an air carrier such as Alaska Airlines. The layout of the smaller lease lots, transient parking, and GA tie-downs was also adjusted to maximize the space available. The GA tie-downs along the crosswind runway were also shifted south to allow the designation of two small lease lots. The footprint and functionality of the alternative remained the same but provides additional flexibility in implementation.

Table 5-2 - Summary of Preferred Alternative Refinements

Change	Benefit
Reduced taxiway length to northeast apron area	Allows for larger lease lots and reduced M&O efforts
Reconfigured the tie-down parking	More efficient layout allows an additional tie-down position
Added a 90,000sf lease lot	Accommodates a Part 121 air carrier
Shifted GA tie-downs along 18-36 south	Allows designation of two small lease lots

5.4 Preferred Alternative

5.4.1 Airside Development

- Reconstruct Taxiway E to meet current design standards and move it out of the middle third of the runway
- Construct a new TDG 2 taxiway in the northeast corner of the apron
- Construct a new TDG 2 taxiway (Taxiway J) between the two runways
- Remove Taxiway F

5.4.2 Landside Development

- Designate new lease lots, including a lot large enough to accommodate a Part 121 carrier
- Relocate GA tie-downs along the crosswind runway
- Expand GA tie-downs in the main apron area
- Relocate transient aircraft parking
- Increase sand storage capacity for M&O

The majority of these improvements will be accomplished through the expansion and development of the northeast portion of the main apron.

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

Criterion	No-Build	Preferred Alternative
Safety		
Improvements to Pilot Situational Awareness	No change	Less chance for confusion between taxiway and crosswind runway
Airport Security/ Access Control	No change	More GA tie-downs within security fence
Modifications to User Behavior	No change	Moves transient parking away from SIDA
Landside Safety	No change	Changes negligible
Wildlife Hazards	No change	Changes negligible

Criterion	No-Build	Preferred Alternative
Function & Engineering		
Construction Considerations	N/A	Good potential for phasing construction
M&O Considerations	No change – Insufficient sand storage capacity	Increases sand storage capacity; provides direct access to runway
Vehicle Access & Circulation	No change	New access roads to expanded northeast apron
Geology/ Long-Term Stability	No change	New construction predominantly on previously disturbed ground
Level of Service/ Operational Efficiency	No change	Similar to existing
Impacts to Users	No change	Minor inconveniences during construction; improved security of tie-downs; potential relocation of tenants
Impacts to Utilities	N/A	Opportunities to improve utilities during airport construction
Environmental Impacts		
Land Acquisition	N/A	None anticipated
Wetlands/Habitat	N/A	Minor fill in wetlands
Archaeological Impacts	N/A	Low potential for inadvertent discovery
Socioeconomic Factors	No change	Additional leasing opportunities
Stormwater Considerations	No change	Additional apron area will require stormwater BMPs
Noise	No change	Northeast apron development could create noise near residential area
Best Planning Tenets		
Satisfies User Needs	No change	Increases number of GA tie-downs within security fence; provides desired floatplane facilities
Land Use Compatibility	No change	No incompatibilities
Future Growth/ Expansion Possibilities	Limited	Provides opportunities for new leases in northeast corner
Project Phasing & Implementation	N/A	Good opportunities for phasing
Highest & Best Use of Airport Land	Northeast corner remains unused	Meets forecast demand without need for land acquisition
Fiscal Factors		
Construction Costs	N/A	$55.9 million
M&O Costs	No change	Increased costs due to increase in paved area
Funding Eligibility	No change	AIP eligible (lease lot development not AIP eligible)
Opportunity for Additional Revenue	No change	New lease lots could bring additional revenue

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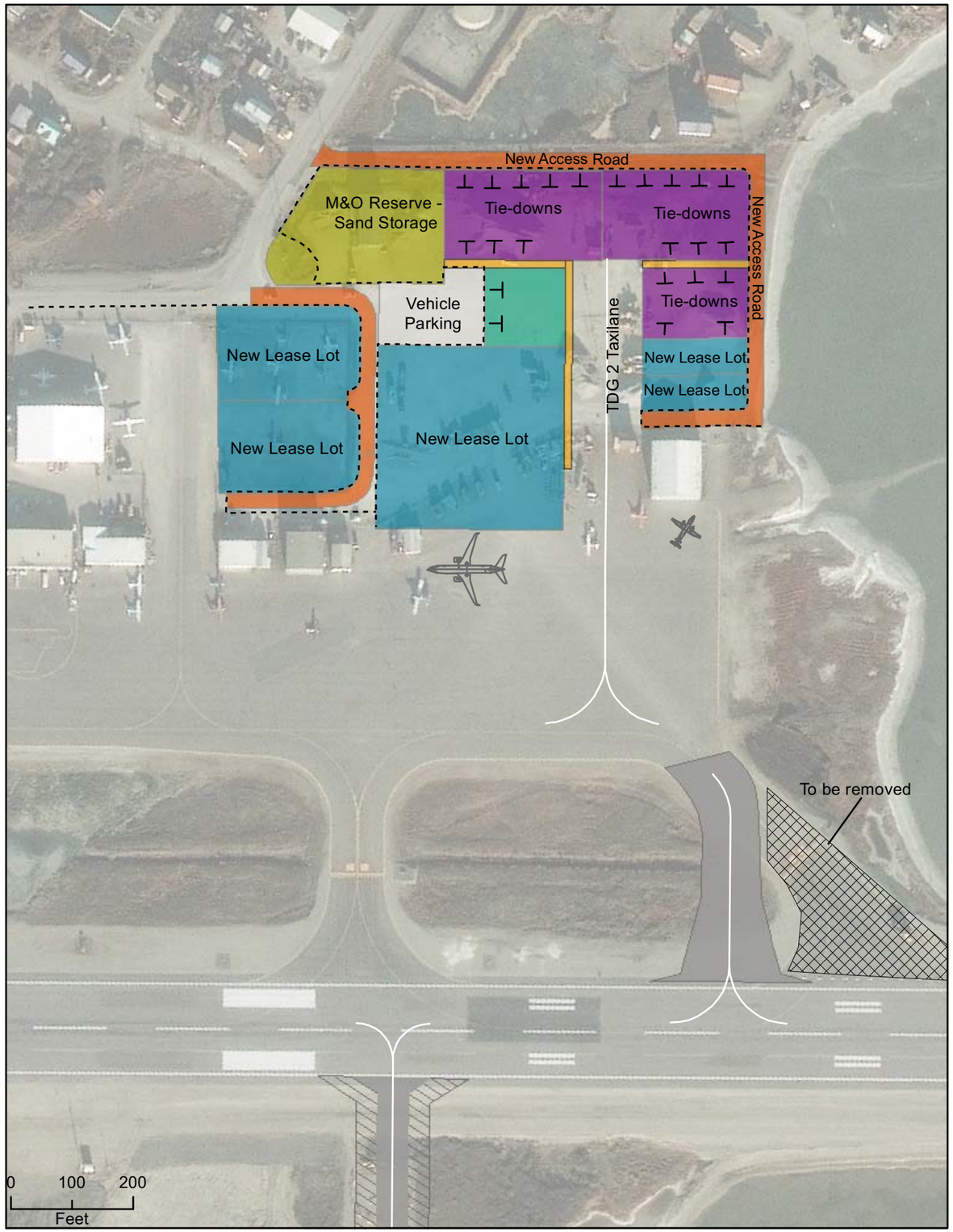

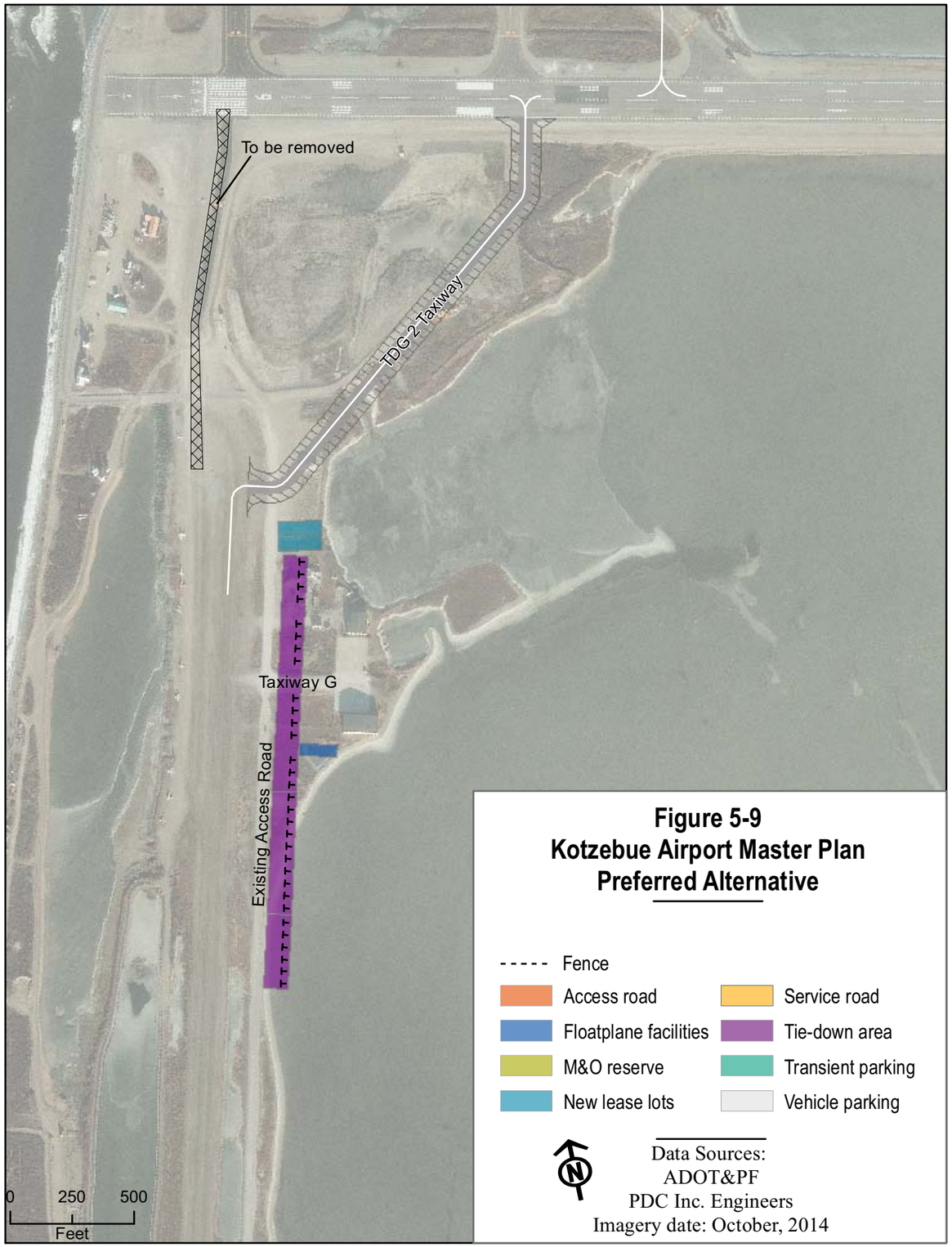

Figure 5-9
Kotzebue Airport Master Plan
Preferred Alternative

- Fence
- Access road
- Service road
- Floatplane facilities
- Tie-down area
- M&O reserve
- Transient parking
- New lease lots
- Vehicle parking

Data Sources:
ADOT&PF
PDC Inc. Engineers
Imagery date: October, 2014

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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 analysis (Chapter 5) to produce a blueprint 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 plan is presented in three phases:

- Phase I – Near-term (0-5 years)
- Phase II – Mid-term (6-10 years)
- Phase III – Long-term (10-20 years)

The first phase contains more detail than subsequent phases and typically makes up the 5-year Capital Improvement Program (CIP). Mid- and long-term development is a more speculative range of projects beyond the CIP and is less detailed due to the imprecise nature of long-range facility planning. ADOT&PF should periodically review the appropriate time for development and adjust as needed to account for changing circumstances.

The preliminary cost estimates outlined in this chapter are order-of-magnitude "planning level" costs. Actual costs will differ based on the final project scope and design. The cost estimates 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 OTZ. ADOT&PF will need to work closely with local government and private landowners to ensure that an adequate supply of material is located.

During the implementation of the proposed projects, ADOT&PF should also work with local utility owners to replace and/or relocate utility lines as needed. Whenever possible, utilities should be relocated to road rights of way in order to provide easier access for future repairs or upgrades.

6.1 Implementation process

In general, each project implemented at the airport must follow specific steps. Preparing for a facility improvement may sometimes start as many as five years before that facility is actually needed in order to coordinate the funding, environmental documentation, design, and finally construction. Below is an example sequence of events necessary to complete a complex airport project.

Four years prior to construction:

- Identify the project in the approved ALP
- Verify the project has or is expected to reach the implementation trigger point
- Validate project justification and funding eligibility
- Determine the level of environmental review
- Identify if flight procedures modification will be required
- Coordinate with local officials and airport users

Three years prior to construction:

- Identify funding sources
- Determine if a benefit/cost analysis is necessary
- Determine if reimbursable agreement is necessary for affected navaids

Two years prior to construction:

- Refine project scope and cost estimates
- Initiate reimbursable agreements and coordinate any navaid requirements with FAA
- Submit requests for new/modified flight procedures to the FAA
- Submit a request for airspace review of projects under non-rulemaking authority
- Begin benefit/cost analysis (if needed)
- Submit EA or CatEx documentation for FAA review and funding
- Coordinate with local officials and airport users on refined project scope and schedule
- Assemble all necessary land for the project

One year prior to construction:

- Complete airspace study
- Complete significant environmental documentation
- Complete 90% design, plans, and specs after FAA environmental findings are made
- Execute reimbursable agreements to support navaids, if relevant
- Prepare and coordinate Construction Safety Phasing Plan
- Secure all necessary local funding
- Secure environmental and other necessary permits
- Submit benefit/cost analysis (if needed)
- Coordinate Safety Risk Management Panel with the FAA Air Traffic Organization (ATO) or FAA Associate Administrator for Airports, as necessary
- Finalize construction bidding, draft grant application, and acceptance schedules

Year of construction:

- Complete 100% design, plans, and specs
- Advertise and secure bids according to acceptance schedules
- Accept federal grants
- Coordinate with local officials and airport users on the progress and schedule
- Issue notice to proceed
- Monitor environmental mitigation requirement during construction

After construction:

- Submit final report and close any accepted federal grants
- Monitor environmental mitigation measures

6.2 Environmental Considerations

This section outlines the environmental considerations associated with the Preferred Alternative.

6.2.1 Fish, Wildlife and Plants

As discussed in Section 2.8.5, Kotzebue Lagoon supports resident fish species and although not a listed anadromous water, is a known migratory corridor for Arctic char. The Preferred Alternative includes minimal fill in Kotzebue Lagoon but significant work adjacent to the lagoon. Previous airport improvement projects have required the use of clean fill material (not to exceed 12 percent in fines) for the construction of project components in Kotzebue Lagoon. ADF&G may require additional construction timing considerations to further reduce the impact to fish. Although the impact to vegetated sites is minimal with the Preferred Alternative, alteration of these sites will likely require compliance with the USFWS recommended bird timing window to protect nesting birds.

6.2.2 Floodplain

The City of Kotzebue participates in the National Flood Insurance Program. Flood Insurance Rate Maps from 1983 show that Kotzebue Lagoon and some adjacent areas fall within the 100-year floodplain. Portions of the Preferred Alternative project area that fall within the 100-year floodplain include the Taxiway E realignment, the eastern portion of the apron expansion, and the southern portion of the tie-down extension. The No-Build Alternative would result in no change to the floodplain, whereas the Preferred Alternative would place more development within the floodplain. Further development within the floodplain may result in impacts to the floodway.

6.2.3 Hazardous Materials

Although no ADEC-listed contaminated sites are located within the work areas identified in the Preferred Alternative, numerous sites exist within the airport property. Groundwater monitoring wells show evidence of groundwater contaminated with petroleum and benzene. There is no difference between the Preferred and No-Build Alternatives in terms of the amount of existing contamination, but construction of the Preferred Alternative has the potential to encounter contamination from these sites.

6.2.4 Archaeological and Cultural Resources

Previous airport improvement projects have encountered human remains on airport property. Also, numerous AHRS sites have also been documented in the vicinity of the airport. Any material excavation associated with the Preferred Alternative has the potential to encounter cultural, archaeological, or paleontological resources. As has been done for previous airport projects, a Memorandum of Agreement (MOA) between the FAA, State Historic Preservation Officer (SHPO), ADOT&PF, NWAB, and the Tribe should be established to outline measures to minimize and address adverse effects.

6.2.5 Light Emissions

The apron expansion will include the installation of new lighting. This could impact properties to the north of the airport.

6.2.6 Water Quality

Construction of the Preferred Alternative has the potential to impact water quality. Previous work in the Kotzebue Lagoon required the use of a turbidity curtain to separate the work area from the lagoon. Erosion and sediment control best management practices (BMPs) can help to avoid this impact. Further airport development may also lead to increased pollution of the lagoon via storm water transport of sediment and pollutants after the construction is complete. Permanent storm water BMPs should be utilized to minimize this impact.

6.2.7 Wetlands

The Preferred Alternative will require some wetland fill. These wetlands are directly adjacent to currently developed land and considered low quality wetlands (USKH 2012). Excavation of material for construction of the Preferred Alternative will likely require dredging of wetlands or waters of the U.S. although likely within waters already used for material excavation and so representing low quality wetlands. The land area surrounding the City of Kotzebue is almost exclusively wetlands and the loss associated with the Preferred Alternative is limited.

6.2.8 Permits

The following permits will likely be needed for the preferred alternative:

- U.S. Army Corps of Engineers (USACE) Section 10/404 permits for fill in wetlands and navigable waters of the United States (U.S.)
- Alaska Department of Environmental Conservation (ADEC) 401 Certificate of Reasonable Assurance to certify that the proposed project would meet State water quality standards
- ADF&G Fish Habitat Permit for construction in Kotzebue Lagoon
- ADNR Land Use Permit for work below the Ordinary High Water Mark (OHWM) in Kotzebue Lagoon
- Establishment of a Memorandum of Agreement (MOA) with the State Historic Preservation Office (SHPO) and interested parties to mitigate the adverse effect to cultural and historic resources
- Consultation with the U.S. Fish & Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) to comply with Section 7 of the Endangered Species Act.
- A City of Kotzebue building permit
- ADEC Construction General Permit for compliance with the Alaska Pollutant Discharge Elimination System

6.3 Project Phasing

The sequencing of projects presented below is based on current and anticipated needs and forecast demand. An update to the airport master plan, including an aviation demand forecast, will ensure projects in the long-range are still appropriate.

6.3.1 Near Term

Projects recommended for the near-term include expansion of the ADOT&PF's sand storage capacity, initial development of the northeast apron area, and reconstruction of the main apron.

I-1 – Sand Storage Expansion

Purpose

The existing sand storage building cannot accommodate the amount of sand required annually.

Scope

Construct an additional sand storage bay on the existing sand storage facility to double the capacity of sand.

Prerequisites

None

Anticipated Environmental Document
Categorical Exclusion

Permits
City of Kotzebue Building Permit

I-2 – Northeast Apron Development Phase 1

Purpose
Address demand for additional tie-downs in the main apron area, the need to move transient aircraft parking further from the runway 9-27 centerline, and the desire to provide a lease lot large enough to accommodate a Part 121 air carrier.

Scope
Construct a gravel TDG 2 taxilane, gravel tie-down area, gravel transient aircraft parking area, gravel access road, and gravel vehicle parking area in the northeast corner of the apron area. Designate five new lease lots and install security fencing (see Figure 6-1). Replace utilities (e.g., sewer, water, electricity) as needed.

Prerequisites
Designation of two lease lots on the east side of Runway 18-36 to accommodate transporter-sized operations (to accommodate any tenant relocations associated with developing the Northeast Apron).

Anticipated Environmental Document
Environmental Assessment

Permits
- USACE Section 404 Wetlands
- DNR Land Use (for work beyond the ordinary high water mark of the lagoon)

I-3 – Apron & Taxiway Reconstruction & Paving

Purpose
The apron has dips and swales, as well as deteriorating pavement that warrants reconstruction. The 2013 Pavement Condition Report identified PCI values for the apron in the 60s. When this project is implemented, the PCI values will likely have fallen below 60. The statewide Pavement Management Section requires apron PCI values be maintained at 60 or greater.

Additionally, the TDG 2 taxilane and aircraft parking constructed under project I-2 should be paved at this time. Paving everything at once will save money over paving each component individually.

Figure 6-1
Kotzebue Airport
Master Plan Update

Implementation Plan
Phase I (0-5 years)

Near-term projects:
I-1 - Sand Storage Expansion
I-2 - Northeast Apron Dev. Ph. 1
I-3 - Apron & Taxiway
Reconstruction & Paving

- Sand storage expansion
- Northeast apron expansion
- New lease lots
- Apron & taxiway reconstruction

Data Sources:
ADOT&PF
PDC Inc. Engineers
Imagery date: October, 2014

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Feet

Prepared for:

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Scope

Reconstruct the main apron and repave Taxiways A and B; install new markings such as taxilane and lead-in lines; replace utilities as needed

Pave the gravel taxiway, transient aircraft parking, and tie-down areas that were constructed under project I-2; install markings as needed.

Prerequisites

Pavement condition assessment

Anticipated Environmental Document

Categorical Exclusion

Permits

None anticipated

6.3.2 Middle Term

Mid-term projects include improvements to automobile parking, the first phase of relocations for the GA tie-downs along Runway 18-36, and a master plan update.

II-1 – Short-Term Parking Improvements

Purpose

The condition and size of the short-term parking area was identified as deficient during public meetings in Kotzebue. The current parking area along Fifth Avenue Extension is gravel, slopes away from the road, and does not have any lighting.

Scope

Expand the parking area to the east to the intersection with Fifth Avenue. Add fill to bring the parking area to the same grade as the road and pave. Install overhead street lighting.

Prerequisites

None

Anticipated Environmental Document

Categorical Exclusion

Permits

- USACE Section 404 Wetlands

II-2 – Tie-down Relocation (crosswind) Phase I

Purpose

The existing tie-downs along Runway 18-36 are within 250 feet of the runway centerline—a non-standard condition. Moving the tie-downs farther from the runway centerline will bring them up to current FAA standards. This is also an opportunity to develop a floatplane ramp on Kotzebue Lagoon to allow floatplanes that use Kotzebue Lagoon an opportunity to be removed from the brackish water.

Scope

Construct a gravel apron to accommodate 15 tie-downs and associated taxilane on the east side of Runway 18-36. Construct a floatplane ramp and wash station on the shore of Kotzebue Lagoon adjacent to the new tie-down area.

Prerequisites

None

Anticipated Environmental Document

Environmental Assessment

Permits

- USACE Section 404 Wetlands
- DNR Land Use (for work beyond the ordinary high water mark of the lagoon)
- USACE Section 10

II-3 – Master Plan Update and ALP

Purpose

By the end of the mid-term, the airport master plan will need to be updated.

Scope

Update the airport master plan, including the Airport Layout Plan.

Prerequisites

None

Anticipated Environmental Document

None

Permits

None anticipated

Figure 6-2
Kotzebue Airport
Master Plan Update

Implementation Plan
Phase II (6-10 years)

Mid-term projects:
II-1 - Short-term Parking
II-2 - Tie-down Relocation, Ph. 1
II-3 - Master Plan Update

- Short-term Parking
- Tie-down Relocation, Ph. 1
- Floatplane Ramp
- New Lease Lots

Data Sources:
ADOT&PF
PDC Inc. Engineers
Imagery date: October, 2014

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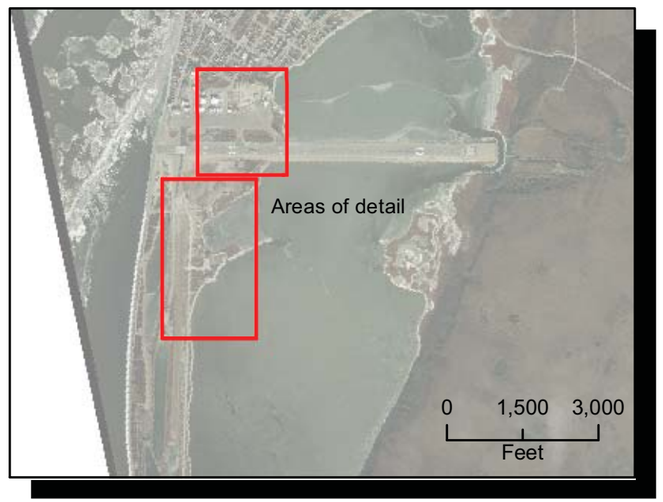
Prepared for:



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6.3.3 Long Term

Long-term development of OTZ includes the completion of the tie-down relocations, bringing taxiways up to standards, and construction of a new taxiway between the runways—Taxiway J.

Note that projects III-2 and III-3 could be combined in order to minimize mobilization/de-mobilization costs.

III-1 – Tie-Down Relocation (crosswind) Phase 2

Purpose

The existing tie-downs along Runway 18-36 are within 250 feet of the runway centerline—a non-standard condition. Moving the tie-downs farther from the runway centerline will bring them up to current FAA standards. This phase of the tie-down relocations will remove the remaining non-standard tie-downs.

Scope

Construct a gravel apron with 14 tie-downs and associated taxilane.

Prerequisites

Tie-down relocation Phase I (project II-1)

Master plan update (project II-3)

Anticipated Environmental Document

Environmental Assessment

Permits

- USACE Section 404 Wetlands
- DNR Land Use (for work beyond the ordinary high water mark of the lagoon)
- USCG Section 10

III-2 – Taxiway E Relocation

Purpose

Taxiway E enters the runway within the middle third of the runway, a non-standard condition. The taxiway also needs to be brought up to current standards for filet design. This is also an opportunity to bring Taxiway D up to current filet design standards.

Scope

Construct a new Taxiway E approximately 200 feet west of the current location. Install new lighting, marking, and signage.

Reconstruct portions of Taxiway D to bring filets up to FAA design guidance.

Prerequisites

None

Anticipated Environmental Document

Categorical Exclusion

Permits

- USACE Section 404 Wetlands

III-3 – Taxiway J Construction

Purpose

The current connecting taxiway (Taxiway F) between the two runways is undesirable because it aligns with Runway 18-36—a non-standard condition that can interfere with pilot situational awareness.

Scope

Construct a new paved TDG 2 taxiway (Taxiway J) between the north end of Runway 18-36 and the western third of Runway 9-27. When Taxiway J is complete, remove taxiway F. Pave Air Force Road from the end of the current pavement (near the north end of Runway 18-36) to a point 100 feet beyond the end of the new tie-down area (Project III-1). Pave Taxiway G.

Prerequisites

Geotechnical investigation

Anticipated Environmental Document

Environmental Assessment

Permits

- USACE Section 404 Wetlands

Figure 6-3
Kotzebue Airport
Master Plan Update

Implementation Plan
Phase III (11-20 years)

Long-term projects:
III-1 - Tie-down Relocation, Ph. 2
III-2 - Taxiway E Relocation
III-3 - Taxiway J Construction

Tie-down Relocation, Ph. 2

- Access Road & Taxiway G Paving
- New Tie-down Area

Taxiway E

- Taxiway E

New Taxiway J

- Taxiway J
- Taxiway J OFA

Data Sources:
ADOT&PF
PDC Inc. Engineers
Imagery date: October, 2014

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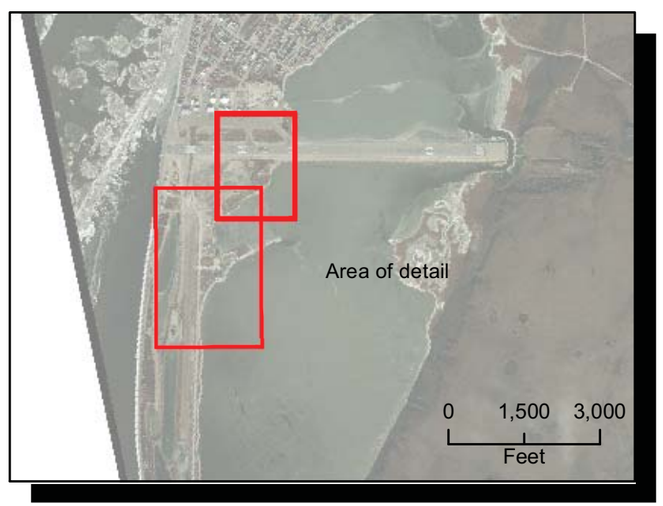
Feet

Prepared for:



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6.4 Estimated Costs

The following table outlines order-of-magnitude cost estimates based on 2015 dollars.

Table 6-1 - Estimated Project Costs

	Project Description	Total Estimated Cost	AIP Eligible?
Phase I: 2016-2021			
I-1	Sand Storage Expansion	$ 2.9 million	Yes
I-2	Northeast Apron Development	$ 8.7 million	Yes[1]
I-3	Apron Reconstruction and Paving	$23.7 million	Yes
	Phase I Total	**$35.3 million**	
Phase II: 2021-2026			
II-1	Short-Term Parking Improvements	$1.2 million	Yes
II-2	Tie-Down Relocation Ph. 1	$5.4 million	Yes
II-3	Master Plan Update and ALP	$0.5 million	Yes
	Phase II Total	**$7.1 million**	
Phase III: 2026-2036			
III-1	Tie-Down Relocation Ph. 2	$3.6 million	Yes
III-2	Taxiway E Relocation	$3.3 million	Yes
III-3	Taxiway J Construction	$6.9 million	Yes
	Phase III Total	**$13.8 million**	

[1] Lease lot development not eligible

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7 Financial Analysis

This section presents an analysis of financial feasibility of airport improvements for the Kotzebue Airport. The discussion includes existing revenue streams and expenses, as well as potential sources of funding from bonding, passenger facility charges, airport landing fees, and in-kind contributions. The section concludes with a discussion about local hire and job skill development opportunities.

7.1 Existing Operating Revenues and Expenses

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

7.1.1 Operating Revenues

The Kotzebue Airport currently has three funding sources: State of Alaska general funds, leasing revenue, and federal Transportation Safety Administration (TSA) grants. During State of Alaska fiscal year 2014, the airport received $1.36 million in funding, predominantly from $1.26 million in state general funds, with an additional $95,000 received from leasing revenues. Table 7-1 summarizes the amounts received in fiscal years 2010-2014 in each of the revenue categories.

Table 7-1 - Kotzebue Airport Operating Revenues by Category, Fiscal Years 2010-2014

Fiscal Year	Facility	Revenue Category			Total
		State General Fund	Leasing	Federal TSA Grant	
2014	Aviation	$ 1,088,746	$ 95,412	$ —	$ 1,184,158
	Facilities	$ 178,840	$ —	$ —	$ 178,840
	Total	**$ 1,267,586**	**$ 95,412**	**$ —**	**$ 1,362,998**
2013	Aviation	$ 1,101697	$ 89,836	$ 6,735	$ 1,198,268
	Facilities	$ 195,172	$ —	$ —	$ 195,172
	Total	**$ 1,296,869**	**$ 89,836**	**$ 6,735**	**$ 1,393,440**
2012	Aviation	$ 1,098,552	$ 112,877	$ 33,536	$ 1,244,965
	Facilities	$ 180,376	$ —	$ —	$ 180,376
	Total	**$ 1,278,928**	**$ 112,877**	**$ 33,536**	**$ 1,425,341**
2011	Aviation	$ 947,201	$ 88,071	$ 31,599	$ 1,066,871
	Facilities	$ 179,502	$ —	$ —	$ 179,502
	Total	**$ 1,126,703**	**$ 88,071**	**$ 31,599**	**$ 1,246,373**
2010	Aviation	$ 990,064	$ 94,250	$ 30,839	$ 1,115,153
	Facilities	$ 176,413	$ —	$ —	$ 176,413
	Total	**$ 1,166,477**	**$ 94,250**	**$ 30,839**	**$ 1,291,566**

7.1.2 Operating Expenses

The Kotzebue Airport incurred expenses of $1.36 million in fiscal year 2014. Supplies and personnel were the largest expense categories, together accounting for more than 70% of total expenses.

Maintenance expense has varied over the years shown due to changes in the types of expenses incurred. Table 7-2 provides more detail about the maintenance expense categories.

Table 7-2 – Kotzebue Airport Detailed Maintenance Expense Categories, Fiscal Years 2010-2014

Category	Expense by Fiscal Year				
	2014	2013	2012	2011	2010
State Equipment Fleet Operating & Replacement Costs	$ 158,658	$ 196,632	$ 215,440	$ 210,354	$ 188,665
Bulk Fuel	$ 84,297	$ 95,116	$ 84,572	$ 99,234	$ 56,254
Chemicals/Sand	$ 0	$ 31,663	$ 90,816	$ 31,205	$ 92,308
Asphalt	$ 730	$ 9	$ 6,633	$ 0	$ 0
Grader Blades	$ 0	$ 16,755	$ 6,222	$ 5,283	$ 21,179
TSA Agreement	$ 0	$ 10,566	$ 52,378	$ 51,960	$ 56,385

In comparing the airport's annual revenues with its expenses, the Kotzebue Airport's expenses regularly exceed the revenue from fuel sales and airport property leases. The vast majority of its operating funds come from state and federal sources 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 Kotzebue Airport has one CIP project underway, with total funding of $15.5 million (see Table 7-3).

Table 7-3 – Kotzebue Airport Capital Projects

Project Name	State ID	Funding	Expense	Balance
Kotzebue GA Apron Expansion	62586	$ 15,550,000	$ 226,942	$ 15,323,058

7.1.4 Historic Airport Improvements Program Funding

The FAA, through its Airport Improvements Program (AIP), provides grants to public agencies for planning and development of public use airports. Over the last 15 years, the Kotzebue Airport has received over $90 million of AIP funding.

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 $55.9 million. As shown in Table 7-4, funding needs will begin with $36.2 million in the 2016–2021 period, $9.2 million in 2021–2026, and $10.5 million in 2026–2036.

Table 7-4 - Summary of Improvement Costs by Phase

Phase	Period	Implementation Program Expenditure
Phase I	2016 - 2021	$ 35.3 million
Phase II	2021 - 2026	$ 7.1 million
Phase III	2026 - 2036	$ 13.8 million
Total		**$ 56.2 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 potential sources of funding: bonding, Passenger Facility Charges (PFCs), landing fees, and other sources. At present, the Kotzebue Airport does not charge PFCs 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, 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 1.5 to 3.5 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 revenue sources, etc.) and some less common (in-kind contributions and local support).

Bonding

It appears that issuance of bonds and capital appropriations by the Alaska legislature are two feasible options for funding the Kotzebue 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 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 a lower required interest rate compared to either type of revenue bonds, which are both backed by a specific revenue stream. In Kotzebue's case, revenues are insufficient to justify the use of revenue bonds, and thus 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 the area. The Alaska Industrial Development and Export Authority (AIDEA) would be the appropriate authority to issue industrial development bonds for facilities at Kotzebue Airport. However, public airport facilities are not eligible for AIDEA funding, though this source could potentially be used by other developers or for industrial or export-related facilities at the airport.

If bonds were issued for improvement to Kotzebue Airport, much or all of the cost would need to be covered externally, likely by the state. PFCs, assuming Kotzebue Airport received FAA authorization to assess them, would likely only cover a small portion of debt costs.

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 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 (EAS) compensation on that route
- On enplanements in Alaska aboard an aircraft having a certified seating capacity of less than 60 passengers

In order for Kotzebue Airport to impose a PFC, the ADOT&PF would have to petition FAA. There are several conditions at OTZ that would require waivers, including its service to a community of less than 10,000 and the fact that the community is not connected to a state highway system. These factors alone make the use of PFCs uncertain at best.

Should ADOT&PF move forward with a petition to collect PFCs at Kotzebue Airport, Alaska Airlines would be the only carrier required to pay because it is the only one serving OTZ with aircraft that seat more than 60 passengers.

In 2013, there were 29,579 passenger enplanements on aircraft with more than 60 seats. With the maximum $4.50 PFC, the Kotzebue Airport could generate approximately $133,000 in fees. While this is a substantial funding source, it would only cover a small fraction of the funding needing for the projects in the implementation plan.

Airport Landing Fee

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 OTZ is the 737-700, with a passenger capacity of 149. It is reasonable to assert 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, that the aircraft will use in the future.

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 Kotzebue Airport. This could take the form of a simple letter informing the user(s) that a landing fee will be assessed for a particular aircraft configuration.

The most viable means of establishing landing fees is to use a compensatory approach. In this model of rates and charges, the user is charged based on actual use of 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. 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 either total weight of the aircraft or annual operational activity. A landing fee for large aircraft operators might be classified under a different term, such as a ramp fee.

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 fraction thereof, of the FAA certified maximum landing weight. Other similarly sized airport markets in Alaska have a range of aircraft landing fees between $0.75 and $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 might include ADOT&PF electing to waive a landing fee or 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 Kotzebue Airport through its Community Facilities Loans and Grants program. In addition to a loan guarantee program, the agency offers Community Facility Grants that may be applicable for the Kotzebue Airport due to Kotzebue's small population and the importance of the airport (USDA Rural Development, 2013).

EDA, a division of the United States Department of Commerce, may offer financial support to the Kotzebue Airport, principally in the form of loans or grants for infrastructure. The EDA website lists a number of major programs, several of which may be directly or indirectly applicable to the Kotzebue Airport (EDA, 2015):

- **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 Strategy (CEDS) Content Guidelines provide suggestions, tools, and resources for developing 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 Kotzebue 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 they are included to spur thinking about other opportunities to fund the airport improvements.

Several entities in the Kotzebue area have a vested interest in development at OTZ. These include:

- Northwest Arctic Borough (NWAB)
- City of Kotzebue
- Kikiktagruk Iñupiat Corporation (KIC)
- NANA Regional Corporation
- Maniilaq Association

In addition to financial contributions, these entities could provide in-kind support by donating gravel, equipment, or labor, as applicable. They could also support airport development by training local residents in the skills needed to work as contractor employees during construction.

As an adjacent landowner, KIC could provide real estate to ADOT&PF for airport development.

The Red Dog Mine has historically been supportive of community investments throughout the NWAB. The mine may be interested in providing financial or in-kind support for Kotzebue Airport's development. This support could be for specific facilities or facility elements that are named to recognize the mine's contribution or made in conjunction with additional advertising or educational opportunities.

Regular air carriers that use Kotzebue Airport may also be interested in supporting airport construction in exchange for naming or other recognition. Within legal constraints, there might be opportunities for preferential use agreements or other beneficial arrangements.

7.4 NWAB Political Support

Political support from the NWAB would help individual projects score higher during evaluations by 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.

7.5 Alaska Hire, NWAB 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, NWAB 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.

7.5.1 Alaska Resident, NWAB, 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, it does still apply to the Northwest Arctic Borough. Under current program criteria published by the Alaska Department of Labor & Workforce Development (DOL&WD; undated), the following classifications qualify for a minimum 90% Alaska resident hire preference, including those most likely needed for public works projects in Kotzebue:

- Bricklayers
- Carpenters
- Cement masons
- Culinary workers
- Electricians
- Equipment operators
- Insulation workers
- Iron workers
- Laborers
- Mechanics
- Painters
- Piledrivers
- Plumbers and pipefitters
- Roofers
- Truck drivers
- Welders

Alaska Native corporations normally include Alaska Native hire clauses in their contracts to encourage shareholder employment. The regional and village corporations for Kotzebue—NANA Regional Corporation and KIC—would likely do the same for work done at Kotzebue Airport.

NANA Regional Corporation includes the NANA Family of Companies, a host of industry-specific subsidiaries that provide services all over the world. One of these, NANA Development Corporation (NDC), has actively worked to train skilled labor in the NWAB. Most recently, NDC hosted the Core Driller's Helper Training program in Kotzebue at the end of March, 2015.

7.5.2 Local and Regional Aviation Employment, Training

The Alaska Department of Commerce, Community & Economic Development's Community Database Online reports that there were 1,357 residents employed in Kotzebue in 2013, of whom 16.9% were employed in the trade, transportation, and utilities industry. While aviation is not specifically listed as an occupational category, several categories include aviation-related jobs such as freight agents, ticket agents, and maintenance workers.

University of Alaska Fairbanks – Chukchi Campus

The UAF Chukchi campus is a component of the University of Alaska system that offers traditional face-to-face courses, distance education courses, and independent learning courses. Students enrolled at the UAF Chukchi campus have access to all of the courses offered by UAF; however, some labs may not be available in Kotzebue.

7.5.3 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 below.

University of Alaska

University of Alaska campus training centers in Anchorage and Fairbanks provide the majority of academic aviation training within the state. The following table summarizes the current aviation-related programs at each campus.

Table 7-5 – University of Alaska Aviation Training Programs

Training Level	Anchorage Campus	Fairbanks Campus
Certificates	Aviation Maintenance	Airframe Airframe & Powerplant Ground 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 Avionics Maintenance & Installation	Avionics Maintenance & Installation

Aviation Career Education

The FAA's Aviation Career Education Academy Program is an aviation summer camp for middle and high school students. The academies offer students an opportunity to learn more about aviation. Numerous academies have been held in Alaska. The academy program may be a resource to bring into the Northwest Arctic Borough to support aviation education.

Alaska Department of Labor & Workforce Development

Through the Alaska Job Center Network, the DOL&WD offers funding to training providers from both state and federal sources as well as training through Individual Training Accounts (ITAs). ITAs are issued to individuals seeking training through their local Alaska Job Center and will vary according to background, skill levels, and training consistent with the position sought.

DOL&WD offers a variety of training programs including:

- 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.

Alaska Department of Commerce, Community, and Economic Development – Division of Community and Regional Affairs

The Division of Community and Regional Affairs administers a variety of grant programs. The City of Kotzebue or the Northwest Arctic Borough might seek funding to support Kotzebue Airport development through such programs as Designated Legislative Grants or Community Development Block Grants.

7.6 References

Alaska Department of Commerce, Community, and Economic Development, *Community Database Online*. http://commerce.state.ak.us/cra/DCRAExternal/community/Details/8aa56b8f-c01a-44a4-8f66-cbac5c6f2f4e, retrieved March 27, 2015.

Alaska Department of Transportation & Public Facilities (ADOT&PF), *Alaska Airports and Aviation 2012 Annual Report*. http://www.dot.alaska.gov/documents/aviation/2012Annual_Report.pdf, retrieved March 24, 2015.

Alaska Department of Labor and Workforce Development, *Alaska Resident Hire Employment Preference Information.* http://www.labor.state.ak.us/lss/forms/employment-pref-info.pdf, retrieved March 24, 2015.

Economic Development Administration (EDA), United States Department of Commerce. http://eda.gov/, retrieved March 26, 2015.

Red Dog Mine, *Community Investment*. http://www.reddogalaska.com/Generic.aspx?PAGE=Red+Dog+Site%2fCommunity&portalName=tc, retrieved March 25, 2015.

United States Department of Agriculture (USDA) Rural Development, *Community Facilities Loans and Grants*, http://www.rurdev.usda.gov/HCF_CF.html, retrieved March 26, 2015.

University of Alaska Fairbanks (UAF) Chukchi Campus. https://www.uaf.edu/chukchi/, retrieved March 27, 2015.

University of Alaska Fairbanks (UAF) Community and Technical College, *Aviation Maintenance Technology, Cert, AAS.* http://www.ctc.uaf.edu/programs/amt/index.html, retrieved March 27, 2015.

Zenger, Anne. Budget Manager, Alaska Department of Transportation & Public Facilities. Kotzebue Airport operations and capital revenue and expense data. Spreadsheet sent by e-mail to PDC Inc. Engineers, March 31, 2015.

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APPENDIX A

AVIATION ACTIVITY AND FORECAST

From: Roach, Jeffery A (DOT)
To: Patrick Cotter
Cc: Royce Conlon; Greene, Alexa J (DOT)
Subject: FW: Kotzebue forecast - edited
Date: Monday, January 05, 2015 8:57:47 AM
Attachments: image001.png

Patrick,

The FAA approves the Kotzebue AMP Update Forecast of Aviation Activity as modified. See you at 1:30 pm today at my office.

Jeff

Jeff Roach, MSS, Northern Region Planning Manager, Aviation and Highways Alaska Dept. of Transportation & Public Facilities
2301 Peger Road Fairbanks, AK 99709 | Office: 907.451.2381 | FAX: 907.451.2313 | Email: jeff.roach@alaska.gov
"Keep Alaska Moving through service and infrastructure"

From: Katrina.Moss@faa.gov [mailto:Katrina.Moss@faa.gov]
Sent: Monday, January 05, 2015 8:18 AM
To: Roach, Jeffery A (DOT)
Subject: RE: Kotzebue forecast - edited

Hi Jeff,

FAA approves the Kotzebue Forecast of Aviation Activity as presented in the edited November 2014 document.

Regards,

Katrina Moss, AICP, PMP
Community Planner
FAA Alaskan Region Airports Division
222 West 7th Avenue #14
Anchorage, AK 99513
907.271.5448

From: jeff.roach@alaska.gov

Sent: Friday, January 02, 2015 11:12 AM
To: Moss, Katrina (FAA)
Subject: FW: Kotzebue forecast - edited

Katrina,

Does the FAA approve the attached Kotzebue AMP Update Forecast of Aviation Activity?

Thank you and Happy New Year,

Jeff

Jeff Roach, MSS, Northern Region Planning Manager, Aviation and Highways Alaska Dept. of Transportation & Public Facilities
2301 Peger Road Fairbanks, AK 99709 | Office: 907.451.2381 | FAX: 907.451.2313 | Email: jeff.roach@alaska.gov
"Keep Alaska Moving through service and infrastructure"

From: Patrick Cotter [mailto:PatrickCotter@pdceng.com]
Sent: Friday, November 21, 2014 9:48 AM
To: Roach, Jeffery A (DOT)
Cc: Royce Conlon
Subject: Kotzebue forecast - edited

Jeff,
Attached is the updated Kotzebue aviation forecast and a summary of the technical committee comments and how they were addressed.
-Pat

Patrick Cotter, AICP, GISP
Associate | Planner – GIS Specialist

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APPENDIX B

FACILITY REQUIREMENTS

From: Roach, Jeffery A (DOT)
To: Patrick Cotter; Maybrier, Scott L (DOT); Hall, Ivet (DOT); Werneke, Alvin E (DOT); Maggard, Roger K (DOT)
Cc: Royce Conlon; Beck, Albert M L (DOT)
Subject: FW: Runway visibility memo
Date: Tuesday, January 20, 2015 1:29:07 PM
Attachments: image001.png

All,

The FAA's response to the Kotzebue AMP Update RVZ question is below.

Jeff

From: Katrina.Moss@faa.gov [mailto:Katrina.Moss@faa.gov]
Sent: Tuesday, January 20, 2015 1:25 PM
To: Roach, Jeffery A (DOT)
Cc: Maggard, Roger K (DOT); Greene, Alexa J (DOT); pat.oien@faa.gov
Subject: RE: Runway visibility memo

Hi Jeff,

Thank you for providing the documentation on the existing Runway Visibility Zone on the current Kotzebue ALP. FAA concurs with the deletion of the RVZ as it is not necessary since the two runways do not intersect and there is no overlap of either runway's safety areas or object free areas.

Best regards,

Katrina Moss, AICP, PMP
Community Planner
FAA Alaskan Region Airports Division
222 West 7th Avenue #14
Anchorage, AK 99513
907.271.5448

From: jeff.roach@alaska.gov
Sent: Friday, January 16, 2015 3:41 PM
To: Moss, Katrina (FAA)
Cc: roger.maggard@alaska.gov; Greene, Alexa J (DOT)
Subject: FW: Runway visibility memo

Katrina,

Attached is the technical memo from PDC Inc. Engineers that we discussed at the Kotzebue AMP Update Technical Committee meeting on Wednesday. It does not appear that a RVZ is required between the non-intersecting runways at the Kotzebue Airport. Please provide a determination on this issue, so we can continue to move forward with the AMP.

Thank you,

Jeff

Jeff Roach, MSS, Northern Region Planning Manager, Aviation and Highways Alaska Dept. of Transportation & Public Facilities
2301 Peger Road Fairbanks, AK 99709 | Office: 907.451.2381 | FAX: 907.451.2313 | Email: jeff.roach@alaska.gov
"Keep Alaska Moving through service and infrastructure"

Client #	AKSAS#62960	**Date**	January 15, 2015
PDC #	14065FB	**Prepared by**	Ken Risse, PE Patrick Cotter, AICP
Project Name	Kotzebue Airport Master Plan Update	**Reviewed by**	Royce Conlon, PE
Subject	***Runway Visibility Zone (RVZ) guidance***		

Topic	Discussion
Introduction	During the development of alternatives for the Kotzebue Airport (OTZ) Master Plan update, the need for maintaining visibility between the two runways came up. If inter-visibility is not required, then additional land is available for development. For OTZ, developable airport land is a limiting factor to airport improvements. This tech memo summarizes the existing guidance on runway inter-visibility and suggests that the RVZ is not necessary for OTZ. Development between the runways would still be limited by Runway Safety Areas and the Glide Slope Critical Area. FAA concurrence with the deletion of the RVZ would ensure that development between the runways would be acceptable to the FAA.
Background	On the current ALP for Kotzebue Airport, the Building Restriction Line (BRL) restricts the use of the land between the runways. The BRL is labeled BRL/RVZ. A snapshot of the current ALP Ultimate Airport Layout Plan is shown below:

1028 Aurora Drive, Fairbanks, Alaska 99709
T: 907.452.1414 ▪ F: 907.456.2707

2700 Gambell Street, Suite 500, Anchorage, Alaska 99503
T: 907.743.3200 ▪ F: 907.743.3295

www.pdceng.com

Topic	Discussion

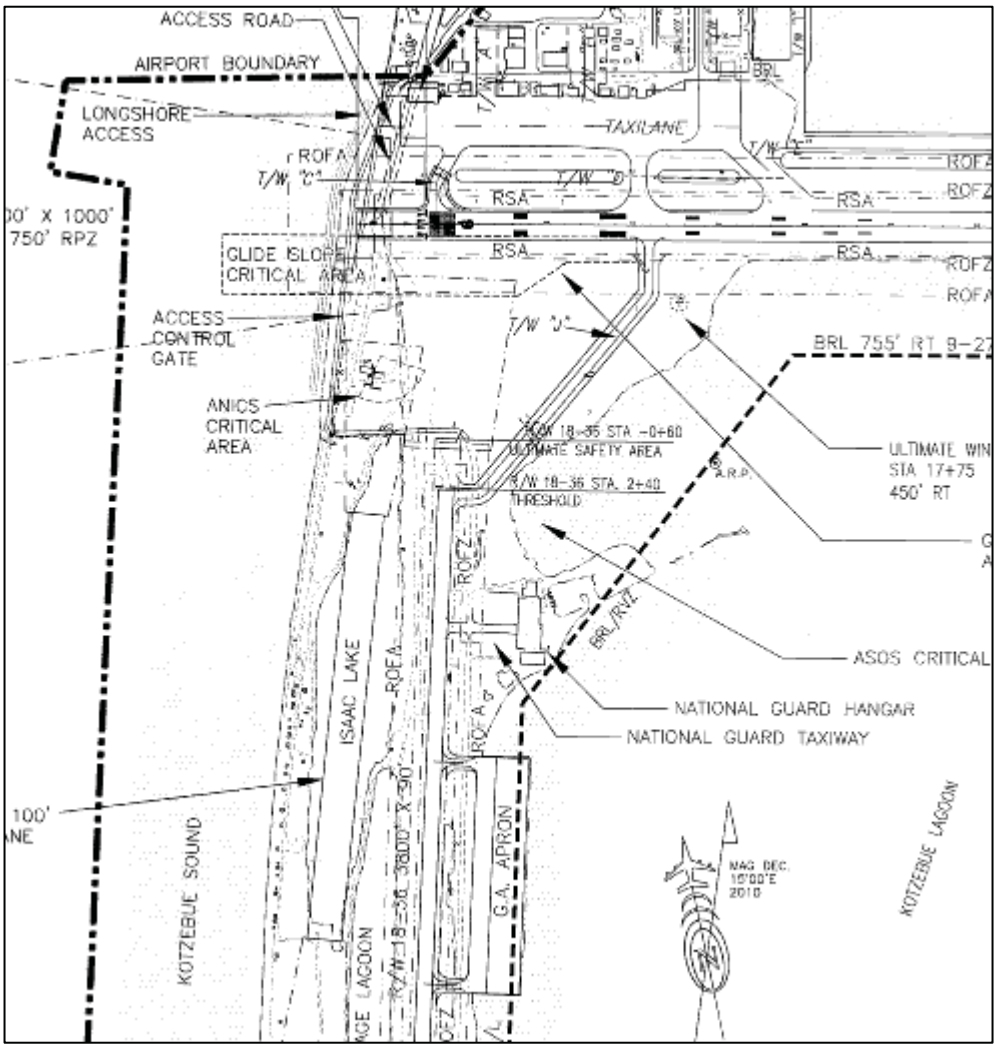

Figure 1 - Snapshot of current OTZ ALP

FAA Advisory Circular (AC) 150/5300-13A provides guidance on the runway visibility zones under Section 305 - *runway line of sight requirements*. For **intersecting runways**, the guidance specifies where the line of sight between runways is required, based on the ends of the runways or the runway extensions. The AC does not address when runways considered "intersecting".

In searching for guidance on when to consider runways to be intersecting, we found a Policy and Procedures Memorandum from the Great Lakes Region of the FAA (PPM 5320.1G). It states:

1. Non-intersecting runways **should** be designed so that the runway safety areas do not overlap. If RSA's intersect, the runway visibility zone described in paragraph 503, of AC 150/5300-13, **should** be applied using a theoretical intersection point. This point could be determined by extending the runway centerlines to a point of intersection.

Topic	Discussion

2. When the OFZ of a non-intersecting runway violates the OFZ of another runway the runway visibility zone described in paragraph 503, of AC 150/5300-13, **must** be applied using a theoretical intersection point. This point **must** be determined by extending the runway centerlines to a point of intersection.

When we were working on the Nome Airport Master plan we had a similar question when we were planning for non-intersecting runways and trying to determine whether there were visibility requirements between runways or how much separation was required between runways. The question was posed as follows:

For the Nome Airport Master Plan, we are looking at line of sight requirements for several runway configurations.

1) X For intersecting runways, AC 150/5300-13 provides clear guidance in Figure 5-6.

2) = For parallel runways, I assume that if there is no intervisibility, the separation requirements for simultaneous runways would apply. Would intervisibility between the runways allow for less separation, or is an air traffic control tower needed to assure the operations are not simultaneous?

3) |- If runways have an approach over another runway, is there any guidance on visibility requirements or separation between runways?

4) / \ If crosswind runways are separate, and flight paths intersect, is there any guidance on visibility or separation requirements?

Pat Oien (FAA Alaska Region) provided the following reply:

Item 2 refer to section 207..requires special studies to reduce separation on case by case basis
Item 3 and 4...FAA is looking at these types of runways and it appears the recommendation will likely be to separate them so their runway safety areas are separated.

Conclusion

The FAA guidance does not appear to require the RVZ between the non-intersecting runways at Kotzebue.

The OFZ's at Kotzebue do not overlap. The RSAs do not overlap. It appears the runways can be treated as non-intersecting, and no RVZ is required. This would allow for development in the area between the runways.

Attachments

1. FAA Great Lakes Region, Policy and Procedures Memorandum 5320.1G
2. Email correspondence with Pat Oien, FAA Alaska Region, dated May 25, 2010

U. S. Department
of Transportation

**Federal Aviation
Administration**

Great Lakes Region
Illinois, Indiana, Michigan
Minnesota, North Dakota,
Ohio, South Dakota,
Wisconsin

2300 East Devon Avenue
Des Plaines, Illinois 60018

POLICY AND PROCEDURES MEMORANDUM - AIRPORTS DIVISION

NUMBER: 5320.1G

DATE: **FEB 13 2001**

SUBJECT: General Processing of Modifications to Agency Airport Design and Construction Standards

CANCELLATION: PPM 5320.1F, dated February 26, 1996

REFERENCE: FAA Order 5300.1F, Approval Level for Modification of Agency Airport Design and Construction Standards

Advisory Circular (AC) 150/5300-13, Airport Design

Advisory Circular 150/5100-13A, Development of State Standards for Nonprimary Airports

Advisory Circular 150/5345-53, Airport Lighting Equipment Certification program.

Great Lakes Region Planning and Coordination Procedures - Desk Guide

FAA Authorization Act, Recodified a 49 USC Section 47105

FAA Authorization Act, Recodified a 49 USC Section 47114(d)(5) as amended by P.L. 106-181 (April 2000)

APPENDIX 1. Changes from prior PPM

APPENDIX 2. Sample Consultant Request Letter for AAS-1 Approval with Checklist

APPENDIX 3. 49 USC Section 47105(c) and 49 USC 47114(d)(5)

APPENDIX 4. Modification to Standards Approval Authority Table

1. Background. Generally, Airports District Offices (ADO)/block grant states may approve all design and construction standards except for those standards set forth in paragraphs 2.c. and 3.a. of this Policy and Procedures Memorandum (PPM), which have been specifically retained by the Office of

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Block Grant States (through ADO's)
Other State Aviation Directors (information through ADO's)

Airport Safety and Standards, AAS-1, or delegated to the Manager, Airports Division, AGL-600 (runway safety area (RSA) will not meet standards). Coordination with other AGL divisions should not be initiated until the ADO/block grant state has received concurrence of AAS-1, when applicable. On certificated airports, coordination with AGL-620 is to determine the applicability of FAR Part 139 requirements [See paragraph 2.f.]. Authority to approve airport design and construction standard modifications is delegated to the ADOs/block grant states by separate policy documents, i.e., Delegation of Authority, Order GL 1100.55A, dated October 1, 1990.

AGL-620 has an oversight responsibility through audit or evaluation of the modifications that are being approved, to assure consistent and prudent use of the approval authority, to assist the ADOs/block grant states with the coordination of more complex proposals, and to provide advice and assistance as may be required by the ADOs/block grant states. FAA Order 5300.1F, dated June 30, 2000, provides the guidance for processing modifications to design and construction standards in the Great lakes Region, except as specifically limited by this PPM.

2. Policy - Design Standards Modifications

a. Variances to the current FAA design standards for an RSA will be the subject of an RSA determination in accordance with FAA Order 5200.8. Also, see PPM 5300.4A, "General Guidance on Runway/Taxiway Safety Areas".

NOTE: FAA encourages any state/sponsor/consultant who may wish to propose special research and development demonstration activity in association with an AIP investment project. These activities are generally initial proposals to AAS-1 through the Great Lakes Region, Airports Division. The Great Lakes Region, Airports Division places a high priority on any AAS-1 endorsement to include R&D demonstration activity in any AIP project. All R&D project costs (testing equipment, monitoring, and etc.) may not be eligible for federal funding and may be the responsibility of the state/sponsor/consultant.

b. FAA airport design standards represent the minimum requirements and recommendations for safe airport operations PLUS a safety margin based upon airport research and past agency experiences. These FAA airport design standards are contained in the advisory circulars listed in Paragraph 34 of the Grant Assurances and are binding for an airport sponsor via the grant agreement subject to FAA RSA determinations and an FAA approved Airport Layout Plan (ALP) which represent the "Agency Standard for that airport". However, FAA RSA determinations and modifications to standards will always take precedence over the approved ALP. The approved ALP will take precedence over the Airport Certification Manual (ACM)/Airport Certification Specifications (ACS), however the safety areas in the ACM/ACS will meet FAR Part 139 requirements.

(1) A modification to a design standard, outside the ALP approval process or through the ALP approval process, may involve a reduction in the margin of safety, while maintaining a safe acceptable operational environment. If there is any dispute the RSA determination and a modification to FAA design standards will always govern, irrespective of any other document. All RSA determinations and/or modification to FAA design standards **must** be included on the approve ALP and airport owners should be encouraged to

incorporate them into the ACM/ACS, for airports certificated under FAR Part 139.

(2) AC 150/5300-13, Tables 2-1, 2-2, 2-3, 3-1, 3-2, 3-3, 4-1, 4-2, and 4-3 depict the **FAA design standards** for various items based on airplane design groups. These same design standards are listed in the extreme right column on the example design program printout (see Appendix 11, of the AC).

(a) The values for taxiway and taxilane separations and clearances derived from the formulas on the bottom of Tables 2-3, 4-1, and 4-3, provide for an **acceptable level of safety**. However, prior to implementing these operationally acceptable values, a modification to standards shall be processed in accordance with this PPM. The computer program shown in Appendix 11 may be used to calculate these values in lieu of the formulas. The values, depicted in the column to the left of the design standards (extreme right column), on the computer design program printout, will provide an acceptable level of safety for the specified conditions, including the type of aircraft.

(b) The separation standards presented in Tables 2-1, 2-2, and 2-3, of the AC, may need to be increased with airport elevation to meet the runway safety area (RSA) and runway obstacle free zone (OFZ) standards. The inner-transitional OFZ varies with airport elevation for precision instrument runways serving large airplanes, as described in paragraph 306., of the AC.

(c) The RSA width design standard for airport reference codes of C-I and C-II is 400 feet and for C-III through C-VI, as well as aircraft in approach category D, the RSA width design standard is 500 feet (See Note 4, Table 3-3 of the AC). The design program printout depicts the appropriate RSA width design standard in the extreme right-hand column.

(d) Paragraph 306 suggests that taxiing, holding, and parked aircraft may be permitted if the aircraft does not penetrate the runway OFZ as defined, i.e., the OFZ is the most restrictive criterion. However, other design standards and criteria may place more restrictive runway separation criteria on taxiing, holding, and parked aircraft than the runway OFZ standard. The following restrictions may be **more critical than the runway OFZ** standard:

1. Paragraph 209 provides taxiway and taxilane separations that would not allow any part of an aircraft, on the taxiway/taxilane centerline, to be within the RSA or to penetrate the runway OFZ.

2. Tables 2-1 and 2-2 provide the separation standards for parked aircraft that can be more restrictive than the runway OFZ.

3. It is possible for aircraft to penetrate TERPS criteria for approach and departure clearance planes even though the aircraft does not penetrate the runway OFZ. These TERPS violations may result in minimum changes and/or the denial of certain approach and departure procedures. The Chicago Flight Procedures Office (CHI FPO) through an aeronautical airspace study must determine the impacts, due to violations of TERPS criteria.

(e) Table 2-4 provides standard dimensions for runway protection zones (RPZs) that enhance the protection of people and property on the ground. The standard RPZ dimensions vary with the visibility minimums for the runway end and therefore do not always correspond to a specific FAR Part 77 approach surface. FAR Part 77 obstruction standards help us to identify obstructions. RPZs identify areas that require land use controls in addition to the object clearing criteria of paragraph 211. The RPZ may be different for each runway end. Also, separate approach and departure RPZs may be necessary when declared distances are utilized (See Appendix 14). It is possible for a single runway end to have two different RPZs (approach and departure), a separate FAR Part 77 approach surface, and a threshold siting surface (Appendix 2). The land acquisition and object clearing requirements for the RPZ and approach protection are set forth in PPM 5300.1B, "Runway Protection Zone and Airport Object Clearing Policy".

(f) Paragraph 503 "Line of Sight Standards". If it can be determined that a 24 hour ATCT will be provided at an airport without any variances in the future, there is no feasible alternative, and a satisfactory level of safety will be provided then a modification to the line-of-sight standard may be approved.

1. Non-intersecting runways **should** be designed so that the runway safety areas do not overlap. If RSA's intersect, the runway visibility zone described in paragraph 503, of AC 150/5300-13, **should** be applied using a theoretical intersection point. This point could be determined by extending the runway centerlines to a point of intersection.

2. When the OFZ of a non-intersecting runway violates the OFZ of another runway the runway visibility zone described in paragraph 503, of AC 150/5300-13, **must** be applied using a theoretical intersection point. This point **must** be determined by extending the runway centerlines to a point of intersection.

c. Modification to standards for siting navigational or lighting aids that are common to the facilities and equipment (F&E) program and standards for marking, lighting, and signing on runways, taxiways, and aprons require approval by the Office of Airport Safety and Standards (AAS-1) through the Great Lakes Region, Airports Division, Safety/Standards Branch, AGL-620. The ADOs/block grant states will not issue approval or denial for any of these modifications without communication from AAS-1.

d. Airport development under the AIP shall conform to FAA design standards, whenever possible.

(1) For a specific project, where unique local conditions preclude compliance with airport design standards, modifications to these standards may be approved by the ADOs/block grant states, except for RSA's (see PPM 5300.4A) and those items reserved for AAS-1 approval (See paragraph 2.c. above).

(2) Approval of the modification of a design standard is contingent on the assurance that the modification will provide an acceptable level of safety, and provide an economical and feasible alternative.

e. Modifications to design standards that are not normally depicted on the ALP and have been successfully used on a previous FAA funded airport project, with prior FAA approval, may be used on subsequent projects without further FAA action and are considered to have specific FAA approval provided:

(1) The airport owner (or designated agent) verifies that the proposed project conditions are similar to those of the project for which FAA previously approved a modification.

(2) The airport owner (or designated agent) include on the project plans or in the project specifications a certification that the proposed modification to standards was previously approved by FAA on (specific date) for an FAA funded project which had similar conditions requiring the same modification as the proposed project.

f. If a certificated airport wishes to deviate from an FAA design standard as an alternative means of complying with a Part 139 requirement, the airport owner must document the justification for the modification, the proposed methods to provide an acceptable level of safety, and why the AC standard cannot be achieved.

(1) The Airport Certification/Safety Inspector, in consultation with the ADO and other appropriate regional staff, will make a determination of acceptability.

(2) Deviations from AC standards will be allowed only in unique circumstances where a clear need dictates, and where FAA believes an acceptable level of safety will be achieved.

g. AAS-1 shall approve **all state and local design standards** for use on federally funded projects (see paragraph 4).

3. Policy – Construction Methods and Material Specification Modifications

a. Modification to standards in the following areas requires prior consultation by the proponent directly with the Office of Airport Safety and Standards (AAS-1) through the Great Lakes Region, Airports Division, AGL-620. The ADOs/block grant states will not issue approval or denial for a modification of any of the following areas without communication from AAS-1.

(1) Construction methods and material specifications, to be used in aircraft operational areas of the airport, for which AAS-1 has not previously approved a modification for use within the region.

(2) Equipment specifications listed in AC 150/5345-53, Airport Lighting equipment Certification Program.

(3) Criteria used to **control the quality or determine the acceptability** of materials and finished products.

(a) Quality control criteria include all the tests performed to determine if adjustments to operations are necessary to stay within specification limits. They include the following: aggregate gradation within tolerance for subbase, base, and surface courses; asphalt content for bituminous mixes; slump and air content for concrete mixes.

(b) Acceptance testing includes all criteria and the tests performed to determine acceptability of the material or finished product and includes the following: density and thickness for subgrade, subbase, base and bituminous pavement; flexural strength and thickness for concrete pavement; and surface tolerances for subbase, base and surface courses and use of nuclear gauge for density acceptance in lieu of cores or borings. For example, use of a nuclear gauge for density acceptance of P-401 Plant Mix Bituminous Pavements, in lieu of taking cores, is currently not acceptable, although use of a nuclear gauge is acceptable for P-152, P-154, P-208, and P-209 (see Appendix 4).

(4) AAS-1 shall approve **all state and local construction standards** for use on federally funded projects (see paragraph 4).

b. The ADO/block grant state may approve all construction methods and material specification modifications to construction standards that have not been reserved for approval by AAS-1. These approvals are contingent on the assurance that the modification to construction standards will provide an economical and feasible alternative, will provide a product that conforms to FAA acceptance criteria, and will perform for its intended design life, based on historical data. This approval authority includes but is not necessarily limited to:

(1) Those addressed in engineering briefs,

(2) Those local construction methods, practices or material specifications that are routinely and successfully utilized in that area and have been previously found acceptable by the AAS-1.

(3) Those FAA non-standard construction methods and material specifications covered by ASTM and AASHTO specifications that have been successfully used during previous airport construction in similar applications (in the sole judgment of the ADO/block grant state).

(4) Any other construction method or material specification modification, which in the judgment of the ADO/block grant state, is to primarily "…accommodate unique local conditions…", except for those items reserved for approval by AAS-1.

(5) Any material specification when locally available materials cannot meet the requirements of that standard, except those standards reserved for AAS-1 approval.

(6) All modifications to the FAA standard specifications, except those reserved for approval by AAS-1. Examples include, but are not limited to:

(a) Approving modification to aggregate gradation and bandwidths, aggregate material test (soundness, abrasion, fracture faces, etc.).

(b) Approving construction equipment and methods, which are not first time, experimental or controversial.

(c) Weather limitations.

(7) The General Provisions of AC 150/5370-10 may be approved, if necessary to make them compliant with local laws and regulations.

c. Modifications to a construction method and material specification with prior FAA approval and that has been successfully used on a previous FAA funded airport project may be used on subsequent projects without further FAA approval provided:

(1) The airport owner (or designated agent) verifies that the proposed project conditions are similar to those of the project for which FAA previously approved a modification.

(2) The airport owner (or designated agent) include on the project plans or in the project specifications, a certification that the proposed modification to standards was previously approved by FAA on (specific date) for an FAA funded project which has similar conditions requiring the same modification as the proposed project.

e. Modifications to construction methods and material specifications that have been previously approved by FAA and adopted as "local Standards" must be revised to be consistent with national standards and the precepts of this PPM at the next regularly scheduled revision of that adopted standard.

4. State design, construction methods, and material specification standards may be developed for airports that are not primary airports in accordance with 49 USC 47105 (c) and AC 150/5100-13A, Development of State Standards for Nonprimary Airports. State highway specifications may be permitted for airfield pavement construction at nonprimary airports in accordance with 49 USC 47114(d)(5) as amended by P.L. 106-181 (April 2000).

a. AAS-1 must approve all state standards.

b. State standards approved by AAS-1 must be updated periodically and reflect FAA standards where applicable.

5. Procedures – Design Standard Modifications

a. The following procedures will be followed by the ADOs/block grant states in processing a request for modifications to airport design standards:

(1) Review the request for consistency with the current approved ALP. If the current approved ALP incorporates RSA determinations for all runways at the airport, the proposal is consistent with that ALP, and approval is not retained by AAS-1 a modification is not applicable. This review shall include a determination that the ALP provides a safe operating environment for aircraft.

(2) Requests for design standard modifications shall normally be requested during the design phase of the project. Request for design modifications shall not be accepted after completion of construction.

(3) In an attempt to achieve standardization, modifications to the AC standards should only be allowed in unique circumstances where a clear need dictates them and where FAA believes an acceptable level of safety will be achieved. For airports with a FAR Part 139 Certificate, other means of compliance not in accordance with AC standards that are acceptable to the Administrator, the airport operator shall be encouraged to document the modification to standards or RSA determination in the Airport Certification Manual/Specifications. For airports with a FAA Part 139 Certificate some AC standards are not subject to "other means of compliance acceptable to the Administrator." Modifications to these AC's (current edition) require AAS-1 approval. The AC's are as follows:

(a) AC 150/5340-1, Standards for Airport Marking

(b) AC 150/5340-4, Installation Details for Runway Centerline Touchdown Zone Lighting Systems

(c) AC 150/5340-18, Standards for Airport Sign Systems

(d) AC 15-5340-24, Runway and Taxiway Edge Lighting System

(e) AC 150/5340-28, Low Visibility Taxiway Lighting Systems

(f) AC 150/5345-12, Specification for Airport and Heliport Beacon.

(4) Upon finding the request acceptable, the ADO/block grant state will initiate the coordination process (if determined appropriate by the ADOs/block grant states, some modifications will not require any coordination with regional divisions). All requests for modifications from national/regional design standards shall be forwarded directly to the other divisions. Coordination with the other operating divisions will be effected as set forth in paragraph 13 of the "Desk Guide". Refer to paragraph 5.b., of this PPM, for AAS-1 coordination.

NOTE: Any modification to design standards which may result in a request for exemption to an aircraft operational rule or the establishment of an instrument flight procedure are of special interest to the Flight Standards (AGL-205), Flight Procedures Office (CHI FPO), and Air Traffic Division (AGL-500). The ADO/block grant state should highlight any known concerns in this area.

(5) In order to minimize reviews, proposed modifications to design standards will be identified in the transmittal letters accompanying airport layout and construction plans that are submitted for airspace coordination. Appropriate justification by the Sponsor (including costs) for the approval of the design modification will be included in the transmittal.

(6) If the coordinated review of the proposal reveals no objections, the modification may be approved. All recommendations regarding reasonableness of cost will be made by the Sponsor, and will be included in the original package coordinated with CHI FPO/AGL-205/470/520. The ADO/block

grant state will provide expert advisory comment on the sponsor's proposal when forwarding to the other divisions. In providing advice regarding whether the cost is reasonable, some factors to be considered by the Sponsor are:

(a) Future role of the airport.

(b) Cost versus benefit of conformance as opposed to modification of the design standards.

(c) Level of present and future aeronautical activity at the airport.

(7) The approved modifications to design standards shall be included in the ALP approval per PPM 5050.5.

b. If the modification to design standards requires approval by AAS-1, per paragraph 2.c., the ADO/block grant state will direct the proponent to submit the proposal to AAS-1 through AGL-620. Prior to the ADO issuing approval or denial for these modifications, communication must be received form AAS-1. A sample letter for the airport owner's/consultant's request to AAS-1 through AGL-620 is included as Appendix 5.

6. Procedures – Construction Method and Material Specification Modifications

a. Airport owners/consultants who desire a modification to a construction method or a material specification that requires (in the sole judgment of the ADO/block grant state) AAS-1 approval in accordance with paragraph 3.a., shall be referred by the ADO/block grant state, with the necessary guidance, to the appropriate AAS Division or individual for approval/advice/assistance, through AGL-620 of the Great Lakes Region, Airports Division. A sample letter for airport owner's/consultant's request to the AAS Division AAS is included as Appendix 5. Upon receipt of AAS-1 approval/advice/assistance and the sponsor/consultant documentation, the ADO/block grant state may consider the appropriateness of a modification action. The ADO/block grant state will issue the appropriate approval/denial to the airport owner/consultant.

b. The following procedures will be followed in the Great Lakes Region to handle requests for modifications to airport construction methods and material specifications not requiring AAS-1 approval:

(1) The ADO/block grant state may approve first-time use of non-standard construction methods and material specifications that are covered in paragraph 3.b. (1) through (7).

(2) The airport owner (or authorized agent) must be agreeable to use a non-standard construction method and/or material specification and must request, in writing, a modification to standards from the ADO/block grant state.

(3) The ADO/block grant state shall review the written proposal and issue the FAA appropriate approval/denial to the airport owner (or authorized agent).

(4) A modification to an airport construction method and material specification is not required for subsequent use of non-standard construction method and material specification for similar applications provided the airport owner (or authorized agent) appropriately document the similar condition [see paragraph 3.c.].

7. Proposal Package for Modifications to Standards - Airport owner's (or authorized agent) requests for modification to standards to accommodate a unique local condition shall contain the following:

a. A list of standards requiring modification and a discussion of why the standards cannot be met.

b. A description of the proposed modifications.

c. A discussion of viable alternatives for accommodating the unique conditions.

d. Assurances that the proposed modifications conform to the requirement of paragraphs 2.d.(2) and 3.b.

8. FAA Approval Letter for a Modification to Standards - All ADO/block grant state and AGL-620 approval letters for modifications, shall contain the following:

a. Date of approval for the modification.

b. Project description and grant number (if appropriate).

c. Conditions requiring the modification.

d. Conditions and rationale for approving the modification.

e. A statement that FAA will not retain a record of the modification and that the **airport owner (or authorized agent) is considered the office of record for the modification**. Failure to retain proper records may require the request for modification to be re-submitted for FAA consideration.

f. Copies of all ADO/block grant state approval letters for modifications shall be forwarded to AGL-620 for entry onto the **Airports Division Modification to Standards File.** It is anticipated AGL-620 will develop a database that airport operators would utilize to determine if FAA previously approved a similar modification and therefore will not require additional FAA action.

Jeri Alles
Manager, Airports Division

APPENDIX 1

CHANGES FROM PRIOR PPM

1. Information contained in FAA Order 5300.1F has been incorporated into this PPM.

2. Format has been changed to enhance clarity and understanding.

3. Deleted appendices 2, 3, 4, 5, and 6 and added new appendices 2, 3, and 4.

APPENDIX 2

SAMPLE CONSULTANT REQUEST LETTER FOR AAS-1 APPROVAL WITH CHECKLIST

(Date)

(For all AAS-1 approvals except for marking, lighting, and sign modifications)
Mr. John Rice
Manager, Engineering Specifications
Division, AAS-200
or
(For AAS-1 approvals of marking, lighting, and sign modifications)
Mr. Bob David
Manager, Airport Safety and Operations
Division, AAS-300
FAA
National Headquarters
800 Independence Avenue, S.W.
Washington, D.C. 20591

THROUGH:

Manager, Safety/Standards Branch, AGL-620

RE: (Airport Name), (Associate City), (State) (brief description of modification to standard, revised construction procedure, or new material), (AIP project No.).

Attached are the Modifications to Standards Checklist and the justification and supporting documentation for the (detailed description of modification of standards, revised construction method, or new material specification) at the (Airport Name).

The subject project is to begin in (month & year) with completion scheduled for (month & year). If you have any questions and/or concerns regarding this, please call our office (telephone number).

Sincerely,
(signature)
(name)
(title)

Great Lakes Region Concurs in the above proposal.

_____ _____
Signature Date

MODIFICATIONS TO STANDARDS CHECKLIST

Checklist For Modification to Standards Requiring
Office of Airports Standards (AAS-1) Approval

This checklist shall be completed and attached to all sponsor's requests for a modification of standards that require AAS-1 approval. An explanation must be provided for any item that is not checked on the checklist and not included in the submittal package.

_____ Description of the type of modification of standards per PPM 5320.1G is included.

_____ Description of unique local conditions requiring the modification to standards, revised procedure, or new material is included.

_____ Discussion that explains how (modification, revised procedure, or new material) will provide an economical and feasible alternative is included.

_____ Discussion that explains how (modification, revised procedure, or new material) will provide an acceptable level of safety and service life is included.

_____ Documentation to support that (modification, revised procedure, or new material) was successfully utilized under similar conditions is included.

_____ Discussion that explains previous FAA approvals, Engineering Brief coordination, and coverage by other specification (ASTM, AASHTO, & etc.) is included.

APPENDIX 3

US Code : Title 49, Section 47105

US Code as of: 01/26/98

Sec. 47105. Project grant applications

- (a) Submission and Consultation. - (1) An application for a project grant under this subchapter may be submitted to the Secretary of Transportation by -
  - (A) a sponsor; or
  - (B) a State, as the only sponsor, for an airport development project benefitting 1 or more airports in the State or for airport planning for projects for 1 or more airports in the State if -
    - (i) the sponsor of each airport gives written consent that the State be the applicant;
    - (ii) the Secretary is satisfied there is administrative merit and aeronautical benefit in the State being the sponsor; and (iii) an acceptable agreement exists that ensures that the State will comply with appropriate grant conditions and other assurances the Secretary requires.
      - (2) Before deciding to undertake an airport development project at an airport under this subchapter, a sponsor shall consult with the airport users that will be affected by the project.
      - (3) This subsection does not authorize a public agency that is subject to the laws of a State to apply for a project grant in violation of a law of the State.

- (b) Contents and Form. - An application for a project grant under this subchapter -
  - (1) shall describe the project proposed to be undertaken;
  - (2) may propose a project only for a public-use airport included in the current national plan of integrated airport systems;
  - (3) may propose airport development only if the development complies with standards the Secretary prescribes or approves, including standards for site location, airport layout, site preparation, paving, lighting, and safety of approaches; and (4) shall be in the form and contain other information the Secretary prescribes.

- (c) State Standards for Airport Development. - The Secretary may approve standards (except standards for safety of approaches) that a State prescribes for airport development at nonprimary public-use airports in the State. On approval under this subsection, a State's standards apply to the nonprimary public-use airports in the State instead of the comparable standards prescribed by the Secretary under subsection (b)(3) of this section. The Secretary, or the State with the approval of the Secretary, may revise standards approved under this subsection.

FEB 13 2001

US Code : Title 49, Section 47114(d)(5)

"(5) USE OF STATE HIGHWAY SPECIFICATIONS.—

"(A) IN GENERAL.—The Secretary may permit the use of State highway specifications for airfield pavement construction using funds made available under this subsection at nonprimary airports with runways of 5,000 feet or shorter serving aircraft that do not exceed 60,000 pounds gross weight if the Secretary determines that—

"(i) safety will not be negatively affected; and

"(ii) the life of the pavement will not be shorter than it would be if constructed using Administration standards.

"(B) LIMITATION .—An airport may not seek funds under this subchapter for runway rehabilitation or reconstruction of any such airfield pavement constructed using State highway specifications for a period of 10 years after construction is completed unless the Secretary determines that the rehabilitation or reconstruction is required for safety reasons.

Modifications to Standards Approval Authority Table
Appendix 4

MODIFICATION ITEM	APPROVAL AUTHORITY			
	ADO	Block Grant State	AAS-1	Remarks
I. Design Standards				
A. All design standards including separation and vertical clearances except the following:	X			Coordinate with AGL-620 for FAR Part 139 items
1. Standards for marking, lighting and signing			X	
2. Standards for siting Navaids and lighting aids			X	
3. Electrical equipment specifications listed in AC 150/5345-53			X	
4. State design standards for nonprimary airports (in accordance with 49 USC 47105 (c) and AC 150/500-13A)			X	
II. Construction Methods and Material Specifications				
A. First time use in region			X	
B. Quality control criteria and acceptance testing			X	
C. State construction standards for nonprimary airports (in accordance with 49 USC 47105 (c) and AC 150/500-13A and 49 USC 47114(d)(5) for airfield pavements)			X	
D. Items previously found acceptable by AAS-1:				
1. Addressed in Engineering Briefs	X	X		Copy to AGL-620 & AAS-200
2. Local construction methods and material specifications except those reserved for approval by AAS-1	X	X		Copy to AGL-620 & AAS-200
3. Construction method and material specification needed for unique local condition except those reserved for approval by AAS-1	X	X		Copy to AGL-620 & AAS-200
4. Modification to material specifications when local material cannot meet the standards except those reserved for approval by AAS-1	X	X		Copy to AGL-620 & AAS-200
5. All modifications to standard specifications except those reserved for approval by AAS-1 [modification of aggregate gradation, material tests (soundness, abrasion, fractured faces), construction equipment specifications, and weather limitations]	X	X		Copy to AGL-620 & AAS-200
6. General Provisions of AC 150/5370-10 to meet local laws.	X	X		Copy to AGL-620 & AAS-200
E. Modifications to a construction method or a material specification with prior FAA approval and meets the same field conditions.				If successfully used may be used without further approval (see Para. 3.c. this PPM)

From: Ken Risse
To: Patrick Cotter
Subject: FW: Line of sight between runways
Date: Wednesday, January 14, 2015 4:34:47 PM

From: pat.oien@faa.gov [mailto:pat.oien@faa.gov]
Sent: Tuesday, May 25, 2010 7:46 AM
To: Ken Risse
Subject: Re: Line of sight between runways

Hi Ken,
Item 2 refer to section 207..requires special studies to reduce separation on case by case basis
Item 3 and 4...FAA is looking at these types of runways and it appears the recommendation will likely be to separate them so their runway safety areas are separated.
Apologize for the delay in answering....
Pat Oien, P.E.
Lead Planner
FAA Alaska Region
(907)271-5445

From: "Ken Risse" <KenRisse@PDCENG.US>
To: John Lovett/AAL/FAA@FAA
Cc: "Royce Conlon" <RoyceConlon@PDCENG.US>, "Patrick Cotter" <PatrickCotter@PDCENG.US>, Pat Oien/AAL/FAA@FAA, "Stumpf, RJ (DOT)" <rj.stumpf@alaska.gov>, "Hall, Ivet (DOT)" <ivet.hall@alaska.gov>
Date: 05/18/2010 01:50 PM
Subject: Line of sight between runways

John,

For the Nome Airport Master Plan, we are looking at line of sight requirements for several runway configurations.

1) X For intersecting runways, AC 150/5300-13 provides clear guidance in Figure 5-6.

2) = For parallel runways, I assume that if there is no intervisibility, the separation requirements for simultaneous runways would apply. Would intervisibility between the runways allow for less separation, or is an air traffic control tower needed to assure the operations are not simultaneous?

3) |- If runways have an approach over another runway, is there any guidance on visibility requirements or separation between runways?

4) / \ If crosswind runways are separate, and flight paths intersect, is there any guidance on visibility or separation requirements?

I'll be down in the Aleutians for a few days, but plan to return by Monday. If you know of any guidance we should be following, please pass it on to Royce or Patrick. If I don't get an email reply, I'll call you after I get back.

Thanks,

Ken Risse, PE, Senior Associate
Civil Engineer

PDC Inc. Engineers
Planning Design Construction

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"Transforming Challenges into Solutions"

APPENDIX C

PUBLIC INVOLVEMENT

(pending)