

# Angoon Airport Master Plan

*Public Review Draft*



**Alaska Department of Transportation  
and Public Facilities**

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## **1.0 INTRODUCTION**

Angoon, Alaska is a community located in Southeast Alaska about 60 miles southwest of Juneau and 50 miles northeast of Sitka (Figure 1). It is located on Admiralty Island, on a peninsula of land bordered by Chatham Strait to the west and Kootznahoo Inlet to the east. Angoon is primarily a Native Alaskan Tlingit community and the only permanent settlement on Admiralty Island in Southeast Alaska. Admiralty Island is also home to Admiralty Island National Monument and its Kootznoowoo Wilderness, parts of the Tongass National Forest.

Although it is situated in the middle of northern Southeast Alaska, Angoon is quite remote – it is only accessible by air and water. It receives its air service at a small seaplane terminal and is visited by Alaska Marine Highway System ferries that land at a state owned terminal south of town. The difficulties inherent in this limited transportation system are detailed herein. In order to address the transportation shortfalls faced by the people of Angoon – the largest community in the region without a landing strip – a planning effort was begun in 2001 as a first step in developing an airport. This plan includes a review of past work that has been completed as part of the planning process for the airport. It describes the analysis of alternatives which culminated in selection of the proposed airport site, surface access, apron layout, and depicts all of these on an airport layout plan. In addition to this document, an Angoon Airport Master Plan Background Report is available with an environmental analysis of the access and apron alternatives and Technical Appendices on biological resources; prehistoric, historic and archaeological resources; and wetlands.

The proposed airport site is on the northeast side of Favorite Bay partially within the City of Angoon and within the Admiralty Island National Monument; proposed access is a 4.2 mile road beginning at the end of the current road system and paralleling the Favorite Bay shoreline approximately 100-600 feet inland from the shore until the road swings inland to access the apron (Figure 2).

It is reasonable to expect that NEPA environmental documentation and detailed airport design drawings will be prepared in 2007-2008; that site and right-of-way acquisition will take place in 2009-2009; and that airport construction will begin in 2010.

**Figure 1 - Location Map**

**Figure 2 – Proposed Angoon Airport, Apron and Access**



## **2.0 PURPOSE AND NEED**

Angoon is located on Admiralty Island in Southeast Alaska. There are no roads to or from this city of 481 (DCCED 2004) year-round residents (more in the summer), making it entirely dependent on air and marine service for transportation of people and freight into and out of town. It is the largest community in Southeast Alaska without an airport, receiving its air service at a small seaplane terminal near town. This facility served 2,408 enplaned passengers and accommodated the landing of 344,137 pounds of mail and freight in 2004.

Regional barge service and State-run ferry service is limited and the nearest large commercial center (Sitka) is 5 ½ hours away by ferry. There is no helipad; helicopters providing emergency and other transport currently land at the high school ball field, near the ACS telephone site, along the shoreline, or wherever it is possible, given the circumstances. Angoon has no hospital and little commerce, thus air travel is essential for health care, purchase of goods, educational, recreational, social, and other community needs.

The seaplane terminal is located near town in Favorite Bay. The prevailing northeasterly wind direction and the crosswind orientation of Favorite Bay make landing difficult or impossible at times. Rocks about 2,000 to 3,000 feet to the west/northwest of the seaplane float in Favorite Bay, which appear as rapids during a large tide change, can make seaplane landings hazardous. There is no (and can be no) landing light system in the waterway. Night landing with a seaplane is prohibited at this facility and is extremely hazardous; doing so is undesirable even in an emergency situation. Operations are thus confined to daylight hours during favorable weather conditions.

An Angoon airport will improve air travel safety, reliability and frequency; provide for emergency medical transportation needs; better meet current travel needs and latent travel demand; reduce the community's isolation; provide improved access to the Admiralty Island National Monument; and support economic development by providing opportunities for employment and growth.

A runway oriented with the prevailing northeast-southwest winds will enhance safety and reliability of air travel. A lighted airport that provides wheeled plane and helicopter access with appropriate navigational aids will reduce risk and make air travel more reliable.

Angoon's new medical clinic was completed in August 2004 by the Southeast Alaska Regional Health Consortium (SEARHC). One result of its operation is that more people are being referred to medical facilities in Juneau and Sitka for early treatment, increasing the travel from Angoon to Sitka and Juneau. Because Angoon's health clinic has no doctor on staff, medical emergencies generally require evacuation to hospitals in Sitka or Juneau. Both routine and emergency medical evacuations are sometimes hampered by lack of lighted landing sites. A lighted airport will increase the reliability of all medically-related travel. A land-based airport has been identified as an important need in meeting both the emergency and non-emergency medical needs of the Angoon population. The importance to the community of reliable air transportation for routine and emergency medical service cannot be overstated.

Angoon residents also travel frequently for cultural activities, school activities, and sports events; however, they do not fly as often as they would like. A travel survey of Angoon residents conducted as part of the *Angoon Airport Reconnaissance Study, April 2004* indicates latent (unfulfilled) demand for transportation. Travelers to and from Angoon report an average of 3.5 times over the previous year that they wanted to take an air trip but could not because of weather, high ticket prices, sold out flights, and other reasons. Additionally, they are unable to fly directly to Kake and Sitka – communities with which they enjoy a great deal of cultural exchange.

Given Angoon's location in central Southeast Alaska and the absence of airports in the vicinity, the airport will fill a hole as a final stop, weather alternative, and emergency landing strip, and will encourage the development of additional routes in the region. An airport with a 3,300 foot<sup>1</sup> runway, which will be adequate to serve Cessna Caravans, DeHavilland Otters, Piper Navajos and similar aircraft, will improve service and access to Juneau and Sitka. It likely will mean

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<sup>1</sup> The State Department of Transportation and Public Facilities minimum standard is 3,300 feet for a small aircraft runway.

more flights in and out of Angoon to more destinations, such as Sitka and Kake. Air carriers indicate that a north-south air service route that includes scheduled stops at several communities, including Angoon, will likely develop.

An airport will help fulfill the mission of the Admiralty Island National Monument, as set out in the Alaska National Interest Lands Conservation Act (ANILCA). ANILCA established Admiralty Island National Monument for the scientific purpose of preserving intact, a unique coastal island ecosystem and assuring continued opportunities for study of Admiralty Island's ecology and its notable cultural, historical, and wildlife resources, within its relatively unspoiled natural ecosystem. Protection and study of Tlingit cultural resources, other historical resources, brown bear, and bald eagle populations are specifically directed. Reliable, modern and safe access to and from Admiralty Island will assure that the Island's ecosystem, cultural, historical, and wildlife resources are available to experience, observe, study and appreciate.

A healthy, growing economy is essential to the long-term sustenance of Angoon's Tlingit culture and the future of the community. An airport will support Angoon's economic development by facilitating transport of residents, visitors, and goods – a prerequisite to economic growth and associated employment opportunities. The potential for growth exists; Angoon is improving commercial fishing and seafood processing infrastructure, more visitors are expected to patronize the tourism-related businesses in Angoon and Admiralty Island National Monument, and visitor-related opportunities such as sightseeing, flightseeing, community and wilderness touring are growing throughout the region.

An airport will enhance Angoon's ability to take advantage of these opportunities. It will support air shipment of fresh seafood products that will allow Angoon to better compete in this growing market. It will encourage continued development of tourism and recreation-related businesses. It will provide adequate capacity for the additional 500 annual flights that are anticipated in the future for these purposes.

### **3.0 AIR TRAFFIC FORECAST**

This is an update of the forecast produced for the *Angoon Airport Reconnaissance Study, January 2003*. It was developed consistent with the recommendations in Federal Aviation Administration Advisory Circular 150/5070-6A, and related July 2001 guidance paper, *Forecasting Aviation Activity by Airport*.

#### **3.1 Angoon Service Area**

This section presents historic and current travel patterns and volumes in the Angoon Service area. Passenger and freight service to Angoon is provided by the Alaska Marine Highway System (AHMS) and a number of Part 135 air taxi and charter services. The ferries land at the state's terminal in Killisnoo Harbor; aircraft land in Favorite Bay and transfer passengers and freight at the Angoon Seaplane Base. Freight is also transported to and from Angoon by barge.

Table 1 shows ferry traffic at Angoon from 1990 to 2003. The number of AMHS stops at Angoon was down about 2.5% between 2002 and 2003, but passenger traffic was down about 10% and vehicle traffic was down about 20% over the same time period. Between 1990 and 2003, vessel stops at Angoon increased nearly 12%, but embarking passenger traffic dropped by nearly 40%, and vehicle traffic dropped by nearly 18% over the same time period.

Historical ferry and air traffic data show no clear patterns. Passenger volumes range from a high of 4,430 enplaned passengers in 1995 to a low of 2,059 enplaned passengers in 2002. Anecdotal evidence suggests that variations in the number of passengers, and pounds of mail and cargo, correspond with fluctuations in design and construction activity of facilities in the community. The high volume years appear to be related to the construction of the road connecting the town with the water reservoir and the design and layout of the new subdivisions south of town. While it is not possible from the data to verify these assumptions, it is reasonable to assume that major construction projects would tend to generate significant additional traffic in a small community

like Angoon. While the level of passengers recorded from 1991 through 2003 follows no discernable pattern, it does establish a good activity range from which to base future growth projections.

**Table 1 - Historical Ferry Traffic at Angoon, 1990 to 2003**

<b>Year</b>	<b>Passengers Embarking</b>	<b>Passengers Disembarking</b>	<b>Vehicles Embarking</b>	<b>Vehicles Disembarking</b>	<b>Trips</b>	<b>Percent Change in Trips</b>
1990	5,847	6,424	760	797	220	
1991	5,735	6,260	828	828	202	-8.2%
1992	5,234	6,137	771	771	244	20.7%
1993	4,278	4,921	661	678	246	.8%
1994	4,107	4,706	686	736	215	-12.6%
1995	3,726	4,753	683	752	235	9.3%
1996	4,183	4,576	817	851	256	8.9%
1997	3,647	4,307	788	813	277	8.2%
1998	3,497	3,940	644	652	265	-4.4%
1999	4,012	4,419	716	769	273	3%
2000	3,754	4,273	642	666	252	-7.7%
2001	3,328	3,962	647	696	227	-10%
2002	3,988	4,398	774	833	252	11%
2003	3,564	3,949	624	661	246	-2.4%
Average Annual	-	-	-	-	-	.79%
Total (1990-2003)						11.8%

*Source: Alaska Marine Highway System Traffic Volume Reports.*

The following table presents air traffic at Angoon from 1991 to 2003.

**Table 2 - Historical Air Traffic at Angoon 1991 to 2003<sup>2</sup>**

<b>Year</b>	<b>Enplaned Passengers</b>	<b>Freight (in and out - pounds)</b>	<b>Mail (in and out – pounds)</b>
1991	3,203	89,892	159,928
1992	2,917	91,969	153,001
1993	2,994	98,569	156,407
1994	4,000	139,298	143,825
1995	4,430	186,686	129,592
1996	3,920	206,380	161,438
1997	3,325	148,015	172,085
1998	3,321	142,094	147,233
1999	2,865	106,384	126,902
2000	3,009	120,409	146,829
2001	3,274	122,197	141,697
2002	2,059	85,612	108,287
2003	2,379	116,683	116,662

*Sources: Alaska Department of Transportation and Public Facilities and U.S. Department of Transportation, Transtat Database.*

### 3.1.1 Scheduled Air Service

Three carriers currently fly scheduled service to and from the Angoon Seaplane Base. Two carriers are based in Juneau and one is based in Sitka. One Juneau-based carrier provides three flights daily in summer and two flights daily in winter. The other Juneau-based carrier provides service to Angoon with eight flights per week. The Sitka-based carrier offers scheduled service three days a week between Sitka and Angoon. In addition, these three carriers offer charter service to and from Angoon and other communities within the region, such as Juneau, Sitka, and Kake.

## **3.2 Charter Traffic**

In addition to charter service offered by the three scheduled carriers, one Sitka-based carrier and only one Juneau-based carrier offer charter service to Angoon. Charters to Sitka include medical evacuations and regular patient transportation to and from the Southeast Alaska Regional Health

<sup>2</sup> In 2004, there were 2,408 passenger enplanements, which is consistent with the regional post September 11, 2001 air traffic rebound.

Consortium (SEARHC) medical facilities in Sitka. Other small carriers may also fly occasional charter trips to and from Angoon.

### **3.3 Mail and Freight**

Mail is transported to and from Angoon by all carriers providing scheduled service to the community. Since the community gets regular ferry service, much of the freight moving to and from Angoon travels on the ferry and via barge service, when available.

### **3.4 Aircraft Fleet Mix**

The following float planes are currently used for service to Angoon Seaplane Base. Number of passenger seats is listed in parenthesis after the name of the plane. Many of these aircraft are amphibious and will continue to serve the community after the runway is constructed.

- One Cessna 180 (3)
- Two Cessna 185s (3)
- One Cessna 206 (3)
- One DeHavilland Otter (10)
- Three DeHavilland Beavers (6)

The air carriers currently serving Angoon Seaplane Base that also provide wheel plane service stated that they would use the following aircraft to serve the Angoon Airport:

- Cessna Grand Caravan (9)
- Piper Navajo Twin – instrument capable (8)
- Amphibious planes as necessary

Medivacs are performed in the Southeast Alaska region by three companies. One is Harris Aircraft Services of Sitka, which takes people to the SEARHC hospital in Sitka. The most demanding aircraft they use is the Piper Navaho Twin (ARC = BI). The other two companies

use a King Air (ARC = BI or BII) and a Learjet 35A (ARC = DI). The Coast Guard also performs emergency medivacs with helicopters.

In addition, another regional carrier who provides wheel plane service would likely serve Angoon with Piper Cherokees (6), Piper Senecas (4), or Britten-Norman Islander twins (7).

### **3.5 Base Year Estimates**

Estimates of base year 2004 aircraft activity at the Angoon Seaplane Base are total enplaned passengers – 2,408; aircraft operations - 4,236; and total mail and freight (in and out) – 344,137 pounds. These activity estimates are developed from interviews with each carrier and other knowledgeable parties. Much of the data for these estimates comes from internal records of the carriers although some estimates are a result of the professional judgment of interview respondents and the interviewer. Terminal Area Forecasts (TAF) for Angoon Seaplane Base contained very little data, but was considered in the development of these base estimates.

In addition to careful counts of recent traffic at Angoon, this base year estimate includes a measure of latent or unmet demand determined from a 2000 survey of Angoon residents<sup>3</sup>. To account for overall latent demand and demand for Angoon-Kake service once the Angoon Airport is developed, additions of 695 enplanements, 772 aircraft operations, and 24,000 lbs of freight were added to 2004 totals.

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<sup>3</sup> This updated forecast uses the same measures for unmet demand and service to additional destinations as used in the previous forecast with one exception. Since the previous forecast was completed, scheduled air service between Angoon and Sitka was initiated, so no adjustments were made for increased enplanements due to Sitka service.



**Table 3 - Angoon Airport Base Year (2004) Activity**

	Enplaned Passengers	Aircraft Operations	Mail/Freight (In/Out) pounds
Fixed Wing Scheduled	2,804	3,104	317,537
Fixed Wing Charter	397	632	26,600
General Aviation	0	500	0
<b>TOTAL</b>	<b>3,201</b>	<b>4,236</b>	<b>344,137</b>
Adjustment for Latent Demand	635	704	21,900
Adjustment for Kake Service	60	68	2,100
<b>ADJUSTED TOTAL</b>	<b>3,896</b>	<b>5,008</b>	<b>368,137</b>

*Source: Southeast Strategies, January 2005.*

### **3.6 Existing Forecasts**

There are two previous air traffic forecasts for the Angoon Service area. The first forecast was developed in 2000 for the *Angoon Airport Reconnaissance Study, April 2004*, and is the forecast this document is updating. The second forecast for the Angoon service area is the Terminal Area Forecast developed by the Federal Aviation Administration (FAA) for the Angoon Seaplane Base.

### **3.7 Angoon Airport Forecast – ADOT&PF**

The following forecast was developed in 2000 for the Alaska Department of Transportation (ADOT&PF) in the *Angoon Airport Reconnaissance Study*. This forecast was based on previous transportation activity at Angoon, the current socioeconomic trends, and a survey of Angoon residents about their travel patterns and activities.

**Table 4 - Angoon Airport Air Traffic Forecast - 1999 to 2026**

Activity	Adjusted Base Year 1999	Est. Opening Year 2007	2011	2016	2026
Enplaned Passengers	4,000	4,610	4,960	5,420	6,480
Air Cargo (total pounds)	116,643	126,880	132,340	139,490	154,970
Annual Operations					
Air Carrier	3,700	3,700	3,700	3,700	3,700
Air Cargo	500	500	500	500	500
Emergency Medical	100	100	100	100	100
General Aviation	500	500	500	550	600
Total Annual Operations	4,800	4,800	4,800	4,850	4,900

Source: URS Consultants, 2001.

### 3.8 FAA Terminal Area Forecasts

The most recently published FAA Terminal Area Forecasts (TAF) provides projections for key elements of aviation activity from 2003 through 2020. The TAF are provided for individual airports listed in the National Plan of Integrated Airport Systems (NPIAS) based on a variety of factors, including historical airport market share as well as the FAA national aviation forecast model. The TAF are unconstrained; i.e., the forecasts assume the airport and air traffic system can accommodate whatever level of demand may be placed upon them. Existing FAA TAF for Angoon extends through 2020 and is presented in Table 5.

**Table 5 - Terminal Area Forecast for Angoon Seaplane Base, 2003 to 2020**

Year	Scheduled Enplanements			Itinerant Operations					Local Operations			Total Operations
	AC	Comm.	Total	AC	AT & Comm.	GA	Mil	Total	GA	Mil	Total	
2000	-	2,659	2,659	-	1,500	1,500	-	3,000	-	-	-	3,000
2001	-	3,091	3,091	-	1,500	1,500	-	3,000	-	-	-	3,000
2002	-	1,832	1,832	-	1,500	1,500	-	3,000	-	-	-	3,000
2003*	-	1,842	1,842	-	1,500	1,500	-	3,000	-	-	-	3,000
2004*	-	1,852	1,852	-	1,500	1,500	-	3,000	-	-	-	3,000
2009*	-	1,906	1,906	-	1,500	1,500	-	3,000	-	-	-	3,000
2014*	-	1,960	1,960	-	1,500	1,500	-	3,000	-	-	-	3,000
2019*	-	2,014	2,014	-	1,500	1,500	-	3,000	-	-	-	3,000
2020*	-	2,025	2,025	-	1,500	1,500	-	3,000	-	-	-	3,000

Source: Federal Aviation Administration, Terminal Area Forecasts, 2005.

### **3.9 Local Significant Conditions**

Several local significant conditions affecting air traffic at Angoon are presented in this section. Some factors would tend to increase demand for air travel and some tend to dampen demand.

### **3.10 Factors Increasing Demand for Air Travel**

The following factors may increase demand for air travel into and out of Angoon.

- Lack of competition in scheduled air service may have dampened demand. While more than one carrier currently serves Angoon, one carrier is dominant and the others that serve Angoon have limited capacity. A land-based airport would likely encourage additional carriers in the region to provide air service to Angoon with wheeled planes.
- Flight safety is improving due to improved instrument navigation aids and systems, and training programs such as the Capstone program. Commercial planes in Southeast Alaska are being equipped with Capstone equipment and pilots are receiving additional training.
- The tourism sector in Alaska is strong and growing. Angoon has significant potential for increased tourism activity, which is often dependant on air travel.
- While salmon prices have been low and processing capacity has changed in recent years, the fishing industry has growth potential. Prices for troll caught salmon are rebounding, the new CQE quota program has great potential to positively impact the Angoon economy, fisheries other than salmon in nearby waters continue, and several local projects are now underway to increase fish processing activities in the Angoon area. Some fish products need to be shipped fresh for the best market prices and often use air transportation.
- Angoon is centrally located within Southeast Alaska and could be a good strategic location for air service throughout the region. Changes in federal subsidies to air carriers could result in changes to the way Southeast Alaska is served. Service by different or multiple carriers

with larger or faster planes, and/or service to different destinations could spur growth in enplanements at the Angoon Airport. If larger communities in the region were served with scheduled service by smaller turbo prop planes in the future, an Angoon Airport could be included in those service routes.

- A new medical clinic in Angoon is increasing the referral of patients to larger medical facilities in Sitka and Juneau. Consequently, demand for routine medical travel is increasing.

### **3.11 Factors Dampening Demand for Air Travel**

The following factors could dampen demand for air travel into and out of Angoon.

- The Southeast Alaska economy has been in a slump for several years and the Angoon economy is also stagnant. Past declines in State revenue have resulted in cuts in State funding assistance to local governments including Angoon.
- The population of Angoon is declining.
- A study is currently underway for improved ferry service to Northern Southeast Alaska communities. More frequent or faster ferry service to Angoon could reduce demand for air travel.
- Air transportation costs have increased due to increased insurance, fuel and security costs. These increases could make air travel relatively more expensive than other options and dampen demand for air service. Also, higher costs have encouraged consolidation within the air transportation industry resulting in fewer carriers and fewer planes.

### **3.12 Trend Line Development**

Low, moderate and high rates of growth for air traffic at Angoon are estimated using trend line analysis, with some adjustment for possible one-time events with large impacts on traffic at the facility. The analysis is developed from examination of prior forecasts, historic growth trends in

past air traffic, population, the economy and other factors impacting air transportation demand. In addition, the content of interviews with air carriers serving Angoon, community representatives and other knowledgeable parties is considered. Considerable professional judgment is used in the development of this forecast.

The Year 2000 Angoon air traffic forecast developed for the *Angoon Airport Reconnaissance Study* used growth rates of 0%, 0.8% and 1.8% for low, moderate and high growth scenarios respectively. This forecast uses slightly lower growth rates because of the stagnant Angoon economy and recent population losses.

### **3.13 Assumptions for Low Growth Forecast**

The low growth forecast scenario carries an assumption of stagnant economic growth in the region and the community. This forecast assumes a growth rate of 0.0% to 2029. Other assumptions for the low growth scenario include:

- New airport fully operational by the beginning of 2009;
- Increased enplanements of 200 in 2009 due to land based service;
- In 2009, fleet mix changes to 6, 8 and 9 seat planes, thus the number of operations per enplanement decreases, resulting in decreased operations;
- Freight carried increases by 20,000 lbs in 2009; and
- One based commercial plane and one based general aviation plane are assumed in 2009.

### **3.14 Assumptions for Moderate Growth Forecast**

The moderate growth forecast scenario carries an assumption of slight economic growth in the region and the community. This forecast assumes a growth rate of 0.5% to 2029. Other assumptions for the moderate growth scenario include:

- New airport fully operational by the beginning of 2009;
- Increased enplanements of 350 in 2009 due to land based service;
- In 2009, fleet mix changes to 6, 8 and 9 seat planes, thus the number of operations per enplanement decreases, resulting in decreased operations;

- Freight carried increases by 35,000 lbs in 2009; and
- Two based commercial planes and one based general aviation plane are assumed in 2009.

### **3.15 Assumptions for High Growth Forecast**

The high growth forecast scenario carries an assumption of moderate economic growth in the region, and slight economic growth in the community. This forecast assumes a growth rate of 1.5% to 2029. Other assumptions for the high growth scenario include:

- New airport fully operational by the beginning of 2009;
- Increased enplanements of 500 in 2009 due to land based service;
- In 2009, fleet mix changes to 6, 8 and 9 seat planes, thus the number of operations per enplanement decreases, resulting in decreased operations;
- Freight carried increases by 50,000 lbs in 2009; and
- Two based commercial plane and two based general aviation plane are assumed in 2009.
- In 2014, service is assumed to begin to Angoon by a regional carrier with turbo prop (16 seat) planes, thus the number of operations per enplanement decreases, resulting in decreased operations. Also, added 350 enplaned passengers and 20,000 additional pounds of freight in 2014 because of improved service.

### **3.16 Air Traffic Forecast Summary**

Table 6 presents a summary of the Angoon Airport forecast, including low, moderate and high growth forecasts to 2029.

**Table 6 - Angoon Airport Forecast Summary 2004 to 2029**

<b>Aircraft Operations</b>	<b>2004 (Base)</b>	<b>Opening 2009</b>	<b>2014</b>	<b>2019</b>	<b>2024</b>	<b>2029</b>
<b>Low Forecast (0%)</b>	5,008	3,407	3,407	3,407	3,407	3,407
<b>Moderate Forecast (0.5%)</b>	5,008	3,589	3,680	3,773	3,868	3,966
<b>High Forecast (1.5%)</b>	5,008	3,860	2,884	3,107	3,347	3,605
<b>Enplaned Passengers (includes Charters)</b>						
<b>Low Forecast (0%)</b>	3,896	4,096	4,096	4,096	4,096	4,096
<b>Moderate Forecast (0.5%)</b>	3,896	4,344	4,454	4,567	4,682	4,800
<b>High Forecast (1.5%)</b>	3,896	4,697	5,410	5,828	6,279	6,764
<b>Cargo/Mail (enplaned &amp; deplaned – in pounds)</b>						
<b>Low Forecast (0%)</b>	368,137	388,137	388,137	388,137	388,137	388,137
<b>Moderate Forecast (0.5%)</b>	368,137	412,433	422,847	433,525	444,472	455,695
<b>High Forecast (1.5%)</b>	368,137	446,588	501,102	539,829	581,550	626,494
<b>Based Aircraft</b>						
<b>Low Forecast (0%)</b>	0	2	2	2	2	2
<b>Moderate Forecast (0.5%)</b>	0	3	3	3	3	3
<b>High Forecast (1.5%)</b>	0	4	4	4	4	5

*Source: Southeast Strategies, January 2005.*

## **4.0 PAST STUDIES**

This section summarizes previous studies that considered Angoon transportation issues.

*Angoon Airport Reconnaissance Study, Alaska Department of Transportation and Public Facilities, August 1982 (revised February 1983).*

ADOT&PF completed a “revised” *Angoon Airport Reconnaissance Study* in February 1983. A total of seven possible sites were studied at that time, all on Kootznoowoo Corporation land within the City of Angoon corporate boundary.

This study also analyzed local wind patterns. National Weather Service weather station generated wind speed and direction data from Angoon (Stn. No. 25310) over 10 years reveals a prevailing wind direction from northeast and southwest. To test a possible “terrain bias” based on weather station location, a Met Set 4 Wind recording station was installed by DOT&PF on top of the Alascom communication tower approximately one-half mile southeast of town. This recorder confirmed a prevailing northeast-southwest wind pattern. This wind direction, generally anomalous for Southeast Alaska, is likely attributable to “topographic funneling”. Wind data indicates a northeast-southwest runway orientation will accommodate winds 97.6% of the time.

*Angoon Airport Feasibility Review, Airport Consulting Services of Alaska prepared for Kootznoowoo, Inc., January 1995.*

In January 1995, Kootznoowoo Inc., contracted with Airport Consulting Services (ACS) to assess the feasibility of developing an airport in Angoon. In its *Angoon Airport Feasibility Review*, ACS concluded that DOT&PF would not pursue airport development without community concurrence on a site. Further:

1. early coordination with the Angoon community and local pilots is needed;
2. the community must vote to support airport development;



3. an Environmental Impact Statement will *likely* be required to address impacts to wetlands, subsistence land uses, and other socioeconomic impacts resulting from airport development; and
4. an evaluation of the compatibility of the proposed airport sites with land use plans will be required.

***City of Angoon Vote, Fall 1998.***

During autumn 1998, Angoon municipal election voters passed a measure supporting development of a local land-based airport. Due to the Angoon community's support of airport development, DOT&PF began the current airport study.

***Alaska Aviation System Plan Update, TRA-BV Airport Consulting for the Alaska Department of Transportation and Public Facilities, March 1996.***

This plan does not address the Angoon Airport in particular. It does state that as a community class airport, the Angoon seaplane base should be eligible for state and federal funding in competition with other community class airports. Although the air traffic forecast does not address the Angoon seaplane base in particular, it does show enplanements at all airports in the Southeast Region to have an average annual growth rate of 1.8 percent for the years 2000 to 2010.

***Southeast Alaska Transportation Plan, KJS Associates for the Alaska Department of Transportation and Public Facilities, March 1999, and Addendum #1, February 2001.***

The Southeast Alaska Transportation Plan (SATP) is Southeast Alaska's long-range transportation vision to guide investments for Alaska Marine Highway System (AMHS) travel to, from and within the region. In assessing region-wide transportation, the study noted no immediate priorities or requirements to serve with regard to air travel with one exception --- it

specifically noted the interest of Angoon in having an airport. Completion of an airport reconnaissance study was recommended.

The study mainly addresses marine transportation needs. This study and a subsequent related study of ferry service options in northern Southeast Alaska may recommend changes to ferry services to Angoon, which will impact demand, to some unknown extent, for air transportation to and from that community.

***Angoon Airport Reconnaissance Study, Alaska Department of Transportation and Public Facilities, April 2004.***

ADOT&PF completed an Angoon Airport Reconnaissance Study in April 2004. This study consisted of a Needs Assessment, including the project purpose and need, background information, the condition of current Angoon seaplane facilities, an air traffic forecast, and a review of the forecast facility needs for an Angoon airport; a Site Analysis, identifying possible airport sites, criteria for site evaluation, evaluation of the possible sites and narrowing down of airport sites from ten to four, together with estimates of project costs; and Conclusions and Recommendations, which looked in more detail at reconnaissance level project costs, and narrowed airport site options down to two areas (four possible sites) that merited further, advanced study. The report concluded with a recommendation of a proposed and alternate site for final project studies.

***City of Angoon Resolution of Support, April 2004.***

In April 2004 the City of Angoon passed resolution 04-08 adopting the Angoon Airport Reconnaissance Study and encouraging ADOT&PF to proceed with development of an Airport Master Plan for the proposed site.

#### 4.1 Airport Sites Considered and Rejected

During the various planning processes just described a total of 14 distinct sites have been studied for an airport.<sup>4</sup> They are depicted on Figure 3 and each location is described below. Land Status for the area is depicted on Figure 4.

**SITE 1:** (2000-2003) This site is a 5,500-foot long by 1,000-foot wide island located 4,000 feet east, northeast of Angoon's City Center. No current access to the site exists. The site direction is NE/SW. The site would require acquisition of undeveloped Kootznoowoo Inc. land.

**SITE 2:** (2000-2003) A 2,000-foot wide by 10,000-foot long island located 9,000 feet southeasterly from Angoon' City Center. The island is forested, lies NW to SE and is currently accessible by marine vessel only. The site would require acquisition of undeveloped Kootznoowoo Inc. and acquisition or long term lease of U.S. Forest Service land.

**SITE 3:** (2000-present) This site is approximately three miles S-SE of Angoon's City Center. The site is on the northeasterly side of Favorite Bay, adjacent an unnamed lake. The site is not connected to the community's road system. The land is generally uplands and forested wetlands with isolated muskeg areas. The site direction is NE/SW. The site would require acquisition or long term lease of U.S. Forest Service land and acquisition of Kootznoowoo Inc. corridor land (from Favorite Bay inland for 660 feet).

**SITE 4:** (2000-2003) This site is approximately 1.5 miles S-SE of site 3 and 4.8 miles S-SE of Angoon's City Center. The site is not connected to the community's road system. It is generally forested wetlands that partly (safety area) include a small lake. It is located near the base of a hillside leading to a mountain ridge. The site direction is NE/SW. The site would require acquisition or long term lease of U.S. Forest Service land.

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<sup>4</sup> Several of the sites have been referred to by different numbers in the various studies. As a result, all of the sites have been included on a single list together with the dates of investigation by ADOT&PF.

**SITE 5:** (1982-1983) Site 5 is located five miles SE of Angoon's City Center and the east side of Chatham Straits. The site is south of Auk'Tah Lake and does not have road access. The site runs in a NW-SE direction. The site would require acquisition of privately owned lots of Kootznoowoo Inc. shareholders and undeveloped lands owned by Kootznoowoo and acquisition or long term lease of U.S. Forest Service land.

**SITE 6 & 6A:** (2000-2003) Site 6 is at the end of the Auk'Tah Lake Road system. Site 6A is oriented NE/SW, while Site 6 is more closely aligned on a N/S axis. Both sites will require road relocation and the acquisition of privately owned lots of Kootznoowoo Inc. shareholders and undeveloped lands owned by Kootznoowoo.

**SITE 7:** (2000-2003) Site 7 is located in the approximate center of the Admiralty Island Peninsula that Angoon is located on. This site is 2.5 miles southeasterly from the community center and is located "between" subdivision lands, off of the road system and inland from Chatham Strait shoreline. The terrain is rolling forested wetlands. The site direction is NW/SE. The site will require acquisition of privately owned lots of Kootznoowoo Inc. shareholders and undeveloped lands owned by Kootznoowoo as well as minor road relocation.

**SITE 8:** (2000-2003) Site 8 is located east E-SE of the ferry across roadway and is 1.5 miles south of the Angoon city center. The site is on rolling forested wetlands. The site is oriented north-south. This site is forested wetlands. The site will require road relocation and the acquisition of privately owned lots of Kootznoowoo Inc. shareholders and undeveloped lands owned by Kootznoowoo.

**SITE 9:** (1982-1983) Site 9 is south and west of Angoon's ferry access road. The terrain is rolling, forested wetlands. The site is located 1 mile south of the Angoon city center. All community infrastructure is available at this site, save wastewater. The site direction is NE/SW. The site will require acquisition of privately owned lots of Kootznoowoo Inc. shareholders and undeveloped lands owned by Kootznoowoo.

**SITE 10:** (1982-1983) Site 10 is south of Angoon's ferry access road. The site is located 0.5 mile south of the Angoon city center. All community infrastructure is available at this site, save wastewater. The site direction is NW/SE. The site will require acquisition of privately owned lots of Kootznoowoo Inc. shareholders and undeveloped lands owned by Kootznoowoo.

**SITE 11:** (1982-1983) Site 11 is located in the approximate center of the Admiralty Island Peninsula that Angoon is located on. This site is 2 miles southeasterly from the Angoon city center. The site is adjacent to the Auk-Tah Road and inland from the Favorite Bay shoreline. The terrain is rolling forested wetlands. The site direction is NW/SE. The site will require road relocation and the acquisition of privately owned lots of Kootznoowoo Inc. shareholders and undeveloped lands owned by Kootznoowoo.

**SITE 12:** (1982-1983): Site 12 is located in the approximate center of the Admiralty Island Peninsula that Angoon is located on. This site is 2 miles southeasterly from the Angoon city center. The NW end of the site encroaches on the Salt Lagoon park area. It is off of the road system and inland from Chatham Strait shoreline. The terrain is rolling forested wetlands. The site direction is NW/SE. The site will require acquisition of privately owned lots of Kootznoowoo Inc. shareholders and undeveloped lands owned by Kootznoowoo.

**SITE 13:** (1982-1983) Site 13 is located in the approximate center of the Admiralty Island Peninsula that Angoon is located on. This site is 2 miles southeasterly from the Angoon city center. The site crosses the Auk-Tah Road. The terrain is rolling forested wetlands. The site direction is NE/SW. The site will require road relocation and the acquisition of privately owned lots of Kootznoowoo Inc. shareholders and undeveloped lands owned by Kootznoowoo.

**SITE 14:** (1982-1983) Site 14 is located north of the end of Auk-Tah Road northeast of the community water supply. It is approximately 3 miles from the Angoon city center. The site direction is NW/SE. The site will require acquisition of privately owned lots of Kootznoowoo Inc. shareholders and acquisition of undeveloped lands owned by Kootznoowoo.

**Figure 3 - Airport Sites Investigated**

**Figure 4 - General Land Status**

Table 7 provides the reasons why sites were eliminated from further consideration during the various planning processes.

**Table 7 - Angoon Airport Studies Site Recommendations (1983, 2000-2004 ADOT&PF)**

Site	Rationale for Eliminating
1	Site 1 is located correctly with respect to prevailing winds. However, it was eliminated due to conflicts with cultural sites and resources, access challenges and limited room for growth. Airport development would impact three historic sites and an historic village on this island. Access would be significantly more complicated than at any other site, requiring either a 0.5 mile long bridge, a series of shorter bridges or a shuttle ferry system. Finally, there is only minimal room for the airport apron, and airport expansion or related growth is not available.
2	Site 2 was eliminated because a runway at this location cannot be oriented correctly to the prevailing winds.
3	Site 3 is the proposed airport site.
4	Site 4 is located correctly with respect to prevailing winds. However, it was eliminated due to topographic features that could affect prevailing winds. Two ridges that will alter the prevailing winds are located approximately 0.5 and 1.5 miles from the runway. Smaller hills are closer. The ridge is approximately 0.5 mile southeast of the runway trend s about 3,150 feet in a NE-SW direction; the ridge that is 1.5 miles northeast of the runway trends E-NE to W-SW. On days with strong winds these ridges will affect prevailing winds by causing down drafts and changes in direction and velocity, that could affect departing aircraft.
5	Site 5 was eliminated because the runway at this location cannot be oriented correctly to the prevailing winds. Secondary concerns are conflicts with current and planned community land use. It is located less than 0.5 mile from the city’s only feasible future landfill site, there are considerable topographic obstructions to horizontal surfaces, and due to its proximity to the city’s drinking water source.
6/6A	Sites 6/6A are located correctly with respect to prevailing winds. However, these sites were eliminated due to conflicts with current and planned land use and with a cultural site,



Site	Rationale for Eliminating
	<p>as well as topographic obstacles. These sites are in areas with residential lots by Kootznoowoo Inc. shareholders, some of which are already being developed by Angoon residents. Residents find the site too close to the community and in areas where residential growth is occurring and planned to continue. An airport would require relocation of portions of the Auk'Tah Road, the site is within 0.5 mile of the city's drinking water source, and it is essentially coincident with the city's only feasible future land fill site. These sites are near historic village sites at the point. The airport would run deep into a ridge. The valley into the ridge required for aircraft to depart to and approach from the northeast begins 1,100 feet before the end of the runway and is 60-feet deep at the end of the runway. This may cause significant down drafts, turbulence, and wind shear at or near the end of the runway. Also, for aircraft departing to the southwest, the change in wind conditions along the runway may be significant as the northeast end of the runway may be in the lee of local southeast winds along the shoreline. Once the aircraft approaches the southwest end of the runway, the protection from the valley will be gone and a crosswind from the southeast may be present.</p>
7	<p>Site 7 was eliminated because a runway at this location cannot be oriented correctly to the prevailing winds. Secondary concerns are conflicts with current and planned community land use. It encroaches on land used for park purposes at the salt lagoon and as zoned and identified in the Coastal Management Plan and the draft 14c(3) plan. It is also within 5,000 feet of the existing landfill and would conflict with some residential lots by Kootznoowoo Inc. shareholders. Residents find the site too close to the community and in areas where residential growth is occurring and planned to continue.</p>
8	<p>Site 8 was eliminated because the runway can not be oriented correctly to the prevailing winds. Secondary concerns are conflicts with current and planned community land use. The airport would conflict with shareholder homesites that are being developed by Angoon residents; it encroaches on land at the salt lagoon used and zoned as a park and as identified in the Coastal Management Plan and the draft 14c(3) plan; and it is within 0.15 mile of the existing landfill. This area is identified in the draft 14c(3) plan for municipal selection for uses (not limited to) berry picking, a sheltered rifle range and archery area, a</p>

Site	Rationale for Eliminating
	<p>developed picnic/barbecue area for residents, a community recreation facility, a boardwalk path around the lagoon, public restrooms, a teen center or community recreation center. Residents find the site too close to the community and in areas where residential growth is occurring and planned to continue. The area is zoned for rural (residential) and park land use.</p>
9	<p>Site 9 was eliminated because it cannot be oriented correctly to the prevailing winds. Secondary concerns are conflicts with current and planned community land use. This site is heavily used for berry picking due to its proximity to the community, road access and prolific berries; is the community rifle range; is zoned for rural (residential use); is subdivided into privately owned residential subdivisions, and has homesites being developed by Angoon residents; and is within 0.25 mile of the existing landfill site. This area is identified in the draft 14c(3) plan for municipal selection to serve future community recreation and open space needs. Residents find the site too close to the community and in areas where residential growth is occurring and planned to continue.</p>
10	<p>Site 10 was eliminated because a runway at this location cannot be oriented correctly to the prevailing winds. Secondary concerns are conflicts with current and planned future community land use. It encroaches on an area zoned for new housing; is immediately adjacent to the existing townsite; is heavily used for berry picking due to its proximity to the community, road access and prolific berries; and is within 0.25 miles of the existing landfill site. It is in an area zoned for rural (residential) use. This area is identified in the draft 14c(3) plan for municipal selection to serve future community recreation and open space needs. Residents find the site too close to the community and in areas where residential growth is occurring and planned to continue.</p>
11	<p>Site 11 was eliminated because a runway at this location cannot be oriented correctly to the apparent prevailing winds. It also conflicts with existing and planned community land use. It would require relocation the main community road that provides access to homes, undeveloped residential lots, the city's water storage and treatment facilities.</p>
12	<p>Site 12 was eliminated because a runway at this location cannot be oriented correctly to the prevailing winds. Secondary reasons are conflicts with existing and planned community</p>

Site	Rationale for Eliminating
	<p>land use. This site would encroach on land at the salt lagoon that is zoned as a park and as identified in the Coastal Management Plan and the draft 14c(3) plan. In the draft 14c(3) plan the area is listed for municipal selection for uses (not limited to) berry picking, a sheltered rifle range and archery area, a developed picnic/barbecue area for residents, a community recreation facility, a boardwalk path around the lagoon, public restrooms, a teen center or community recreation center. There is a lack of suitable “on site” material and adverse soil conditions. There are possible obstruction to the approach and horizontal surfaces. It is also within 5,000 feet of the existing landfill site.</p>
13	<p>Site 13 is oriented correctly to prevailing winds. However, was eliminated due to conflicts with current and planned community land use. It is zoned for rural (residential use), residential and park uses; and is where there are privately owned residential parcels in a subdivision with homesites being developed by Angoon residents. It encroaches on the salt lagoon which is used and zoned as a park, and identified as such in the Coastal Management Plan and the draft 14c(3) plan. This area is identified in the draft 14c(3) plan for municipal selection for uses (not limited to) berry picking, a sheltered rifle range and archery area, a developed picnic/barbecue area for residents, a community recreation facility, a boardwalk path around the lagoon, public restrooms, a teen center or community recreation center. It is within 5,000 feet of the existing landfill. Residents find the site too close to the community and in areas where residential and commercial growth is occurring and planned to continue.</p>
14	<p>Site 14 was eliminated because a runway at this location cannot be oriented correctly to the apparent prevailing winds. Secondary reasons are that it conflicts with current and planned community land use, is within 5,000 feet of a potential landfill site, would require relocation of the city’s water storage and treatment system, and could potentially negatively impact the city’s drinking water source.</p>
<p><i>Sources: Angoon Airport Reconnaissance Study, Alaska Department of Transportation and Public Facilities, August 1982 (revised February 1983). Angoon Airport Feasibility Review, Airport Consulting Services of Alaska prepared for Kootznoowoo, Inc., January 1995. Angoon Airport Reconnaissance Study, Alaska Department of Transportation and Public Facilities, April 2004. City of Angoon Resolution of Support, April 2004. Angoon Airport Master Plan, Background Report, Alaska Department of Transportation and Public Facilities, June 2006.</i></p>	

## 4.2 Proposed Airport Site

Site 3 is the proposed airport location site (see Figure 5, 13 sheets depicting airport and access road plan and profile). It consists of approximately 269.8 acres, located three miles south-southeast of Angoon's city center on the northeasterly side of Favorite Bay. The site is partially within the City of Angoon and within the boundaries of the Admiralty Island National Monument, mostly on land managed by the U.S. Department of Agriculture, Forest Service. The site is approximately 4.2 miles from the current terminus of the community's road system. The land is generally a mixture of upland forest and bog wetlands.

This site offers the best location for a runway from a wind and obstacle perspective. It is ideally located for the prevailing NE-SW winds. The runway is located parallel with the prevailing winds allowing a pilot to take off into the wind an estimated 95% of the time. The local topography should not significantly influence prevailing winds at the runway other than the typical reduction of wind that occurs below the tree line. A ridge approximately one mile to the southeast and appears far enough away that any downdrafts coming off the end of the ridge should not be a factor to departing aircraft. The Angoon Airport Proposed Site:

1. Has the best approach/departure alignment with respect to prevailing winds;
2. Has the fewest topographic obstructions;
3. Is preferred by all present aircraft carriers servicing Angoon;
4. Does not impinge upon current or future community residential, commercial or recreational land use and growth; it allows for future community growth;
5. Allows for airport expansion;
6. Has acceptable area environmental impacts;
7. Has the same level of subsistence use by Angoon households as all of the airport sites;
8. Will reduce noise impacts to Angoon as much as any of the remotely located sites;
9. Has the least visual impact; and
10. Is the preferred airport site of Angoon residents, the City of Angoon, the Angoon Community Association (Angoon tribal government), and Kootznoowoo Inc.

**Figure 5 - 13 Sheets Plan & Profile: Proposed Angoon Airport Site, Apron and Road Access**

## **5.0 AIRPORT ACCESS AND APRON ALTERNATIVES**

### **5.1 Access Alternatives Considered and Rejected**

Five airport access alternatives and four apron alternatives were examined for the proposed site. Access alternatives 1-4 and apron alternatives 1-3 are all on the southeast side of the proposed airport facility site. Access alternative 5 and apron alternative 4 are on the northwest side of the proposed airport. Descriptions and an aerial photograph depicting all alternatives follow (Figure 6).

#### *5.1.1 Access Alternative 1*

In Access Alternative 1, an access road would begin at the end of the existing Killisnoo Road, just past the existing water tank. The new road would avoid the Favorite Bay tidal flats to the east, and intersect Favorite Creek approximately 500 feet upstream from the mouth. The road then parallels the beach fringe at approximately 200 foot of elevation, and crosses an unnamed creek next to the proposed facility site at approximately 300 foot, 1000 feet inland from the creek mouth. Total length of this access alternative is 4.20 miles (from the end of Killisnoo Road) of which 3.03 miles are below the 100 foot elevation contour. Apron Alternatives 2 and 3 are both associated with this alternative and are located on the southeast side of the runway (Apron Alternatives 2 and 3).

#### *5.1.2 Access Alternative 2*

Access Alternative 2 follows the same route as Alternative 1, except where it crosses the unnamed creek next to the proposed facility site. In Alternative 2, the road crosses the creek in the uplands, at approximately the 450 foot elevation, 2500 feet inland from the creek mouth. Total length of combined Access Alternative 2 is 4.30 miles, 2.60 miles of which are below 100 feet in elevation. This access route would be primarily associated with Apron Alternative 1 located on the southeast side of the runway.

**Figure 6 -Access and Apron Alternatives**

### *5.1.3 Access Alternative 3*

Access Alternative 3 would begin at the end of the existing Killisnoo Road, just past the existing water tank. The new road would pass well above the Favorite Bay tidal flats to the east, and intersect Favorite Creek at approximately 2000 feet upstream from the creek mouth. The road parallels the beach fringe at about 500 foot of elevation, and crosses the unnamed creek next to the proposed facility site at approximately 450 feet, 2500 feet inland from the mouth. The total length of this alternative is 4.4 miles, with 0.28 miles below the 100 foot elevation contour. This access route would be primarily associated with Apron Alternative 1 located on the southeast side of the runway.

### *5.1.4 Access Alternative 4*

Access Alternative 4 follows the same route as Alternative 1, except where it crosses Favorite Bay. In Alternative 4, the road crosses Favorite Bay by a 1,000 foot bridge/causeway to the northwest of the tidal flats. Total length of this road is 2.40 miles; 1.90 miles are below the 100 foot contour. Apron Alternatives 1, 2, and 3, all of which are on the southeast side of the runway, are each accessible from this access alternative.

### *5.1.5 Access Alternative 5*

Access Alternative 5 departs from the main road (that parallels Favorite Bay) at 0.30 miles southeast of the rock quarry. This access road tends north-northeast to cross Favorite Bay and two small islands with three bridges. The longest bridge is 1,000 foot in length; the others are 150 foot and 225 foot in length. The road curves around the headwaters of another small, unnamed creek, and meets Apron Alternative 4 on the northwest side of the runway. The total length of this road is 2.00 miles, with 0.96 miles below the 100 foot contour.



## 5.2 Proposed Access Alternative

The proposed access route is Access Alternative 1. Its selection is based on the following comparison of impacts:

### 5.2.1 Land Ownership and Land Use

A fundamental factor in the selection of an Access Alternative is the presence of the Angoon Island National Monument and its status as Wilderness land. Access Alternative 1 is primarily on Kootznoowoo Inc. corridor lands from the shoreline to 660 feet inland, so it avoids the Monument to the maximum extent practicable, while minimizing other impacts.

Access Alternative 2 and 4 similarly avoid Monument land to the extent practicable, but are not preferred due to other factors.

Access Alternative 3 is located primarily on Wilderness land in the Monument.

Access Alternative 5 crosses up to ten privately-owned residential parcels and would disrupt residential use and quiet enjoyment. It crosses land identified as a municipal selection in the draft 14c (3) plan for its future use as a “Central Park” providing open space and play areas between residential subdivisions. It also has the potential to impede the navigation of larger boats in Favorite Bay.

### 5.2.2 Fish and Wildlife

There are no significant differences between Access Alternatives 1, 2 and 3 in regard to fish and wildlife; all cross Favorite Creek upland from the mouth. Access Alternative 4 crosses a high value estuary at the mouth of Favorite Creek (and the head of Favorite Bay). Access Alternative 5 crosses Favorite Bay and its estuary.

Access Alternative 4 is located within 330 feet of two eagle nests.

### 5.2.3 Archeology and Cultural Resources

Known archeological sites are located in lower elevations and along the Favorite Bay shoreline. Alternative 4 may disrupt at least one of the known sites. To the extent that the access route is ultimately sited further from the shoreline and at higher elevations, it will likely have less impact on archeological sites.

Access Alternative 3 is located on higher ground and is the furthest removed from Favorite Bay. While Access Alternative 1 is nearer to the shoreline and at lower elevations along its route, it is far enough removed from the shoreline to minimize the difference in potential impacts between Access Alternatives 1 and 3.

Access Alternative 5 crosses Favorite Bay and passes through the shoreline on both sides, though not in the vicinity of any known archeological sites.

### 5.2.4 Subsistence Activity

Each of the alternatives is expected to have minimal impact on subsistence uses in the Angoon area and the impact will be similar no matter which route is chosen. All will increase access to the eastern shore of Favorite Bay.

### 5.2.5 Wetlands

Access Alternative 5 has the least impact to wetlands, while Alternative 4 has the highest impact. Access Alternatives 1 and 3 impact similar amounts of wetlands. All of the wetlands, except for those crossed at the head of Favorite Bay by Alternative 4, have low to medium value throughout their routes. Additionally, each of the alternative access routes can be adjusted to minimize its impacts to wetlands.

### 5.2.6 Cost

Access Alternatives 1 and 3 are similar in cost. The bridge costs associated with Alternatives 4 and 5 make these routes two to three times higher.

## 5.3 Apron Alternatives Considered and Rejected

Each of the apron alternatives propose the same size apron (188.5 feet x 810 feet or 3.5 acres) with areas for aircraft tie downs, for construction of a terminal and airport support structures, a 50 foot wide taxiway to the runway, and a 40 foot roadway connecting to the access road. The only difference is in the apron location. Apron Alternative 1 is located on the southeast side of the runway, approximately at the midpoint of the runway and begins 561.5 feet from the runway centerline. Apron Alternative 1 could be reached by Access Alternatives 1, 2, 3 or 4.

Apron Alternative 2 is located on the southeast side of the runway, approximately 1,100 feet from the southwest end of the runway. Apron Alternative 2 could be reached by Access Alternatives 1, 2 or 4.

Apron Alternative 3 is located on the southeast side of the runway, at the extreme southwest end. Apron Alternative 3 could be reached by Access Alternatives 1, 2 or 4.

Apron Alternative 4 is located on the northwest side of the runway, at the midpoint of the runway. Apron Alternative 4 is only associated with Access Alternative 5.

All of the surface access and apron alternatives have been compared to determine which of them is best based on their relative impact, cost, and utility. This section identifies the proposed alternative and the reason for this selection.

#### **5.4 Proposed Access and Apron Alternative**

Apron Alternative 1 is proposed. Apron Alternative 4 was eliminated due to the fact that it is not reasonably accessible from the proposed access route. The selection of Apron 1 is based upon the following factors:

##### *5.4.1 Land Ownership and Land Use*

All apron alternatives are on undeveloped U.S. Forest Service land, there is no difference among the alternatives based on land ownership and land use.

##### *5.4.2 Fish and Wildlife*

There is no difference among the apron alternatives due to fish and wildlife impact. All are upland from the shore; the entire area is bear habitat and used for deer hunting; there are no mapped eagle nests. There is no difference among the apron alternatives based on fish and wildlife impact.

##### *5.4.3 Archeology and Cultural Resources*

There is no difference among the alternatives based on impact to archeology and cultural resources.

##### *5.4.4 Subsistence Activity*

Each of the apron alternatives is expected to have minimal impact on subsistence uses in the Angoon area and the impact will be similar no matter which apron is chosen.

##### *5.4.5 Wetlands*

There are very few differences between Apron Alternatives 1 or 2. Apron Alternative 1 involves slightly more acres (2-3 acres total) of wetlands compared to alternative 2, but the wetlands in 1 are not of high value and do not cover a significantly greater portion of the proposed apron than

does Alternative 2. Apron Alternative 3 has no wetlands due to its relatively steep topography (which creates development challenges discussed under cost).

#### 5.4.6 Cost

Apron Alternatives 1 and 2 are similar in cost. Apron Alternative 3 is significantly higher due to the amount of fill that will be needed given the steep topography of the site. The cost of this alternative is nearly three times that of the other two. This would also lead to higher costs over the life of the airport given that apron expansion can be anticipated at some point in the future.

#### 5.4.7 Other: Operations

To the extent that all other factors are equal or nearly equal, an apron location at the mid-point of the runway is preferable because it reduces the amount of time that aircraft dwell on the runway (safety) and reduces aircraft taxi time to the apron (operating costs). Apron Alternative 1 is located at the mid-point, while Alternative 2 is located approximately one-third of the way from the southwest end of the runway. Apron Alternative 3 is located at the extreme southwest end of the runway.

## **6.0 FACILITY REQUIREMENTS**

### **6.1 Introduction**

This chapter identifies facilities for the Angoon Airport for the 20 year planning period from airport opening estimated at 2009.

The requirements analysis is conducted for the airside and landside facilities of the airport. Airside facilities include the runway; taxiways/taxilanes; runway approaches, protection zones, and approach minimums; the apron; lighting, marking and navigation aids; and heliport facilities. Landside facilities include cargo, terminal facilities, aircraft storage facilities, airport support facilities, and airport access.

The air traffic forecast, airport classification and critical aircraft identified in Chapter 3.0 and current FAA dimensional criteria serves as the basis for determining these requirements through 2029 with the following assumptions:

1. Any airport that is established in Angoon would be served by Federal Aviation Regulations (FAR) Part 135 air carriers using the aircraft that were included in the forecast of aviation demand presented in the chapter 3. These include the Cessna Grand Caravan and the Piper Navajo.
2. The Angoon Airport would ultimately be equipped with instrument approach capabilities with visibility minimums under  $\frac{3}{4}$ -statute mile on at least one approach using GPS technology.
3. Given the presence of passenger activity, a small passenger terminal, parking lot and other landside amenities will be desirable.

The resulting requirements represent a long-range view of the airport. They also are stated conservatively and intended to represent a facility that could operate safely, provide for the community's needs and meet all FAA design criteria. Requirements are each described in Section 5.2 of this report, and summarized on Table 8.

Using the information developed in this chapter, the Airport Layout Plan is developed.

**Table 8 - Facility Requirements**

<b>Component</b>	<b>Identified Need or FAA BII Standard</b>	<b>Proposed Opening Day Airport Specification</b>
<b>Runway</b>		
Wind coverage (15 mph crosswind)	95% or greater	96.1-99.7% coverage
Length	3,300 ft provides 100% of fleet served	3,300 ft
Width	75 ft	75 ft
Capacity		Capacity for ops per year
Runway Safety Area Width	150 ft	150 ft
Safety Area Length Beyond Runway End	300 ft	300 ft
Object Free Area Width	500 ft	500 ft
Object Free Area Length Beyond Runway End	300 ft	300 ft
Surface Condition	Prepared surface and in good condition	Pavement
Line-of-site and Gradient	Meet all line-of-site and gradient requirements.	Meets all requirements
<b>Taxiways</b>		
Amount and Location of Taxiways		1 exit taxiway to main apron
Surface Condition	Prepared surface and in good condition	Pavement
<b>Miscellaneous</b>		
Apron Size		3.5 acres
Apron Surface Condition	Prepared surface and in good condition	Pavement
Runway Lighting		Operational MIRL
Nav aids on Airport		REIL and PAPI
Runway Markings	Visual marking	Non-precision markings
Helipad		Helicopters park on apron near fixed wing aircraft
Airfield Signage	Signage as appropriate	Signs designating runways, taxiways, and restricted airfield space
<b>Airspace</b>		
Part 77 Surfaces	Free of hazards	Free of hazards
<b>Landside</b>		
Terminal Building	Design to reserve option to construct	Design to reserve option to construct
Lease Lots		Five 12,500 sq. ft. lease lots available
Access Road and Vehicle Parking	Access road off airfield, adequate vehicle parking	Access road off airfield, 10 parking spaces
Fuel Facility	Space reserved	Lease space reserved
ADOT&PF Facilities and Equipment	Adequate facilities and equipment	To be arranged with City of Angoon
Fencing and Security	Perimeter fencing	Perimeter fencing for wildlife control
<b>Utilities</b>		
Water	Potable water	Provided by tenants/City as needed
Sewer	Sewer service	Provided by tenants/City as needed
Phone		
Electric		
<b>Floatplane Facilities</b>		
Angoon Seaplane Facility	Good condition	No upgrade proposed



## 6.2 Airfield Requirements

The initial step in the analysis is the determination of the airport's classification, known as the Airport Reference Code (ARC). The FAA has developed a set of guidelines contained in FAA Advisory Circular 150/5300-13, *Airport Design*. The particular set of guidelines to follow is determined by the ARC, and the ARC is determined by identifying the most demanding aircraft, or group of aircraft, expected to regularly use the airport.

In Chapter 3.0, the Angoon Airport critical aircraft is identified as the Grand Cessna Caravan and the ARC is identified as BII. Table 9 lists related airfield specifications important to the design of the Angoon Airport.

**Table 9 - Specifications for Forecast Critical Aircraft for Angoon**

Description	Cessna Grand Caravan	Piper Navajo
Airport Reference Code (ARC)	A-II	B-I
Approach Speed	79 knots	100 knots
Wingspan	52.1 feet	40.7 feet
Length	41.6 feet	32.7 feet
Tail Height	15.5 feet	13.0 feet
Maximum Takeoff Weight	3,600 pounds	6,200 pounds

*Sources: R&M Engineering; URS Consultants, 2005; Southeast Strategies 2005; various FAA Circulars.*

## 6.3 Runway Requirements

FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length. At Angoon where activity would be limited to aircraft weighing less than 12,500 pounds, the determination of required runway length is a function of the class of airplane having the most critical need. Other factors and conditions applied to the calculations are set forth as follows:

- Mean daily maximum temperature - 62<sup>0</sup> F
- Airport elevation estimated at 120 to 150 ft. msl
- Stage length (aircraft trip length) - 500 Miles

The following table shows the runway length required for the aircraft forecast to use the Angoon Airport over the next 20 years. The exhibit shows the longest and shortest calculated runway lengths from the FAA Runway Length Requirements computer model.

**Table 10 - Runway Length Requirement**

Percent of Aircraft Fleet Served	Length Requirement
75%	2,250 feet
95 %	2,780 feet
100 %	3,300 feet

Source: Information compiled by URS, lengths calculated by the FAA's Runway Length Requirements Computer Model.

The ADOT&PF requires the minimum length of any runway be 3,300 feet which coincides with the runway length requirement to serve 100% of the aircraft feet. In the future the airport may need to accommodate aircraft larger than the current critical aircraft or handle precision approaches so the site should be able to expand beyond the initial runway length.

### 6.3.1 Runway Design Standards

To further define the airport it is necessary to define the FAA design standards that are applicable at the airport. These standards are based on the following:

#### Initial Development

- Critical aircraft weighing less than 12,500 pounds.
- Approach visibility minimums for a visual runway not lower than ¾-statute mile.

#### Ultimate Development

- Critical aircraft weighing less than 12,500 pounds.
- Precision approach on one end with approach visibility minimums lower than ¾-statute mile.

Table 11 defines the FAA's Runway Design Standards for a BII facility.

**Table 11 - Runway Design Standards**

Descriptor	BII Facility Initial* Design Standard	BII Facility Ultimate Design Standard **
Runway width	75 feet	100 feet
Runway shoulder width	10 feet	10 feet
Runway blast pad width	95 feet	120 feet
Runway blast pad length	150 feet	150 feet
Runway Safety Area (RSA) width	150 feet	300 feet
RSA length (beyond runway end)	300 feet	600 feet
Object Free Area (OFA) width	500 feet	800 feet
OFA length (beyond runway end)	300 feet	600 feet

\* Assumes a visual approach with not less than ¾-statute mile minimum.

\*\* Assumes a precision approach on one end with approach visibility minimums lower than ¾-statute mile.

Sources: Information compiled by URS from guidance contained in FAA AC 150/5300-13 Airport Design.

### 6.3.2 Taxiways

It is assumed that the airport would be constructed to allow for the eventual addition of a full parallel taxiway system to facilitate runway and landside interface. However, initial runway construction would be limited to aircraft turnarounds and activity levels would be light enough to allow for aircraft taxiing on the runway, thus excluding the need for a full parallel taxiway. Table 12 defines the design criteria for the taxiway system.

**Table 12 - Taxiway Design Standards**

Descriptor	BII Facility Initial* Design Standard	BII Facility Ultimate Design Standard **
Runway centerline to taxiway centerline	n/a	300 feet
Taxiway width	35 feet	35 feet
Taxiway edge safety margin	7.5 feet	7.5 feet
Taxiway shoulder width	10 feet	10 feet
Taxiway safety area width	79 feet	79 feet
Taxiway Object Free Area width	131 feet	131 feet
Taxilane Object Free Area width	115 feet	115 feet

\* Assumes a visual approach with not less than ¾-statute mile minimum.

\*\* Assumes a precision approach on one end with approach visibility minimums lower than ¾-statute mile.

Sources: Information compiled by URS from guidance contained in FAA AC 150/5300-13 Airport Design.

### 6.3.3 Aprons and Tie-Downs

It is recommended that an aircraft parking apron be constructed at Angoon Airport large enough for parking up to three passenger aircraft as well as five tie down locations for transient aircraft.

The apron dimension parallel to the runway is based on a terminal lease lot with 150 feet of frontage on the apron, a Fixed Base Operator (FBO) lot with 100 feet of apron frontage, five future lease lots each with 100 feet of apron frontage and three, 20 feet wide, utility and access easements between the future lease lots as depicted in the Airport Layout Plan. This results in an apron dimension parallel to the runway of 810 feet.

The building setback and thus the apron edge farthest from the runway was determined by projecting a 7:1 transitional surface from the primary surface upwards and away from the runway centerline. The 7:1 transitional surface would start at 500 feet from the runway centerline, which is the ultimate width of the primary surface given the establishment of a precision instrument approach. At 750 feet from the runway centerline, we can construct a 35 foot high building without penetrating the 7:1 surface.

The first 50 feet of the apron, 700 feet to 750 feet from the runway centerline is reserved for future lease lots, a future terminal building lot and a Fixed Base Operation (FBO) lot. The next 63.5 feet is for aircraft parking and starts at 700 feet from the runway and goes to 636.5 feet from the runway. The 636.5 runway offset coincides with the tail height clearance line and the taxilane object free zone (OFA). This aircraft parking area will accommodate the transient aircraft tie down locations and up to three of the largest critical aircraft, the Grand Caravan. The wingspan of the Grand Caravan is 52.1 feet and the length is 41.6 feet. Assuming a uniform separation of 25 feet wingtip to wingtip, the 810 foot apron distance parallel to the runway would be more than adequate to park and turn aircraft. It is likely that the aircraft would be parked and the tiedowns would be oriented into the wind parallel to the runway.

On the runway side of the 63.5 foot aircraft parking area would be the Taxilane OFA and a 35 foot taxilane parallel to the runway. This would add another 75 feet to the apron for a total apron distance from the centerline of 188.5 feet.

The Airport Layout Plan is based upon these requirements.

*6.3.4 Runway Protection Zones (RPZ's)*

The airport at Angoon would be developed to allow for an instrument approach to at least one and potentially both runway ends over the course of the next 20-years. The determination of which end receives the approach would be made based on analysis of wind and weather conditions as these data become available. It is probable that any approach would be Global Positioning System (GPS) based but may rely on other emerging technologies. Currently, a GPS approach is classified as non-precision but is likely to be upgraded to that of a precision approach in the future. As a result, design criteria for precision approaches should be considered throughout this site analysis. Table 13 shows the requirements for Runway Protection Zones associated with visual, non-precision and precision instrument approaches.

**Table 13 - Runway Protection Zones**

Approach	Width at Runway End	Length	Width at Outer End	Area
Visual (20:1)	500 feet	1,000 feet	700 feet	13.8 acres
Non-Precision(34:1)	1,000 feet	1,700 feet	1,510 feet	49.0 acres
Precision (50:1)	1,000 feet	2,500 feet	1,750 feet	78.9 acres

*Source: Information compiled by URS from guidance contained in FAA AC 150/5300-13, Airport Design*

To accommodate a visual approach, the airport's primary surface would need to be 500 feet wide. However, when the precision approach is incorporated, the airport's primary surface would need to be 1,000 feet adding lateral clearance requirements to the site layout.

### 6.3.5 Airport Lighting

The runway should be equipped with Medium Intensity Runway Lights (MIRL) and the taxiway with Medium Intensity Taxiway Lights (MITL). The taxiway and the runway should also have lighted airport signs. In addition, the airport will need a rotating beacon and two lighted wind cones.

The taxiway and runway lighting as well as the lighted airport signs will be powered from a lighting regulator in the electrical building. The rotating beacon and the two lighted wind cones will be powered from the airport control panel in the electrical building. There will be a PCL (pilot controlled lighting) receiver interfaced with the airport control panel which will allow the pilot turn on and adjust the intensity of the airport lighting by keying his radio mike while on the airport Unicom frequency. All of the airport lighting including the Runway End Indicator Lights (REILs) (see section 5.2.7 *Navigational Aids*) but excluding the PAPI will be connected to the PCL receiver and will therefore be pilot controlled.

Currently, there is no electricity at the site. To provide power for these systems an on-site generator or a power extension from existing electrical lines would be needed.

### 6.3.6 Navigational Aids

Both approaches would be visual in the initial development phase. Therefore, only visual navigational aids, such as Runway End Indicator Lights (REIL), which provide positive visual contact with the approach end of a runway, and the Precision Approach Path Indicator (PAPI) would be needed.

The PAPI is an approach path indicator system that provides the pilot with a visual indication of the plane's vertical position relative to the glide slope. It consists of four colored light units installed in a single row on the left side of the approach end of a runway. The aircraft is on slope if the two units nearest the runway show red and the two units furthest from the runway show white, too high if all units show white, and too low

if all units show red. This system has an effective visual range of about 5 miles during the day and up to 20 miles at night.

Ultimate development for the airport would address the desire for the Global Positioning System (GPS) based approach. The GPS is a Department of Defense (DoD) developed satellite-based radio navigation system. The system consists of three major segments: Space, Control, and User. The Space segment consists of a constellation of 24 satellites in circular orbits, the Control segment consists of monitoring stations, ground antennas, and a Master Control Station (MCS), and the User segment consists of antennas and receiver-processors that provide positioning, velocity, and precise timing to the user.

With the implementation of the Wide Area Augmentation System (WAAS) enhancement of GPS navigation, a higher quality approach can be obtained. The WAAS system was developed for the FAA for commercial aircraft precision approach landings. It consists of ground based reference stations and two geo stationary satellites broadcasting correction information to specialized GPS receivers. This augmented GPS signal corrects signal errors in the GPS system that can be caused by ionosphere disturbances, timing, and satellite orbit errors. The system covers both inland and offshore areas.

The WAAS augmented GPS system would require land-based visual aids such as Omnidirectional Approach Lighting Systems (ODALS) for final identification of and approach to the airport. In upgrading to the GPS system, it is presumed there will be a change from medium to High Intensity Runway Lights (HIRL).

#### 6.3.7 *Power*

Power to the airport would be supplied by connection to existing community of Angoon systems. On-site provision is not recommended because power would be needed "24/7" and onsite power provision would require frequent maintenance which would likely not be readily available.

The single phase overhead electrical utility power line will be extended from the existing electrical distribution system to the airport location. A pad-mounted transformer will be located adjacent to the terminal building and a secondary service conduit routed from the transformer to the building. The electrical service will be 120/240 volt, single phase, and will feed a main distribution panel through a combination meter/disconnect located on the outside of the terminal building.

A telephone utility cable will be mounted on the overhead power line poles from the existing telephone utility system to the airport. A telephone service will be provided via a conduit down the last pole and routed underground to a Network Interface Device (NID) on the terminal building. The telephone receptacles in the building will be fed directly from the NID in conduit.

The main distribution panel will be located in a small building constructed to house electrical and other equipment needed to power and control the airport taxiway, runway lighting and other equipment around the airport including the beacon, lighted wind cone, REILs, PAPIs, and runway/taxiway signs. All airport equipment requiring power will be fed from the main distribution panel.

The PAPI and REIL navigational aids described in Section 5.2.7, *NAVAIDS*, will be powered from a step up transformer located in the electrical building. The transformer will step up the voltage from 240V to 7200V. This power will then be routed underground through a cable in conduit to the PAPIs and REILs at each end of the runway. A step down transformer will be located adjacent to the PAPIs on each end that will step the power down to 120/240V. This power will feed the PAPIs and be routed underground down to the REILs. Underground vaults will be placed along the conduit route to allow the cable to be pulled into the conduit and to allow drainage. The vaults will not have floors and will have drainpipes routed out of the sides at the bottom of the vault. The drainpipes will be daylighted out of the embankment or into a ditch.



### 6.3.8 Helicopter Landing Areas

It is anticipated that the new airport will facilitate increased helicopter use. However, at this time no requirement for special helicopter landing facilities is foreseen. Under clear conditions, it is anticipated that helicopters will use a direct approach to the apron.. Under less than optimum weather conditions, helicopters will use the runway for landing and takeoff, and the taxiways and taxilane will be used as a taxi route to the parking apron where the transient spot will be used for parking.

### 6.3.9 Seaplane Facilities

Once the new airport enters service, most air activity will likely move to the new facilities. As a result, the existing seaplane facilities will continue to be adequate for the needs of Angoon and no upgrades for this facility would be required.

### 6.3.10 Perimeter Fencing

Security will not be an immediate issue for this airport. However, a perimeter fence would be needed for wildlife control. The fence should be high enough to prevent wildlife from jumping over and should include a skirt to prevent bears from forcing their way underneath as an additional deterrent. This combination should be sufficient to prevent runway incursions.

## 6.4 **Landside Facilities**

In addition to the airfield requirements that have been established, it is important to allow area for landside development. Landside facilities begin at the edge of the apron.

#### *6.4.1 Terminal Building*

ADOT&PF does not plan to build a terminal building at the Angoon Airport, however an area is designated for this use to accommodate private or city development of a facility. A terminal building would likely not house the usual airport related functions due to the relatively low number of forecasted enplaned passengers. It would consist of a waiting room, a small office, two small restrooms (men and women), and a maintenance closet. Total area of the building footprint should be no more than 2,500 square feet.

A terminal building would also require a potable water supply, a sewage and drainage system, electrical supply, and a telephone connection. Connection to existing island systems or on-site provisions can meet these requirements.

#### *6.4.2 Apron Lease Lots*

Space on the apron for five lease lots would accommodate Fixed Base Operators (FBO) areas, hangars, fuel storage and similar buildings and uses. A typical lease lot footprint would be 12,500 square feet. Hangars would typically be for single- or twin-engine piston airplane (whether based or transient). Each would be about 1600 square feet and would be located along the parking apron. It is likely that one of the operators at the airport would decide to construct facilities to establish a small aircraft fueling and service facility in Angoon once the land-based airport has opened. Fuel storage tanks would be above ground on a lease lot.

#### *6.4.3 Automobile Parking*

Ten automobile parking spaces (8x12) should be constructed at the airport to meet peak demand. An area of 1,700 square feet should meet this space requirement as well as provide circulation within.

#### 6.4.4 Ground Access

A two lane road should meet all access needs between the parking lot and the closest existing road on the island.

#### 6.4.5 Cargo Support Areas

ADOT&PF does not plan to construct a cargo support building. No major cargo support areas would be needed for this airport. A small shed would likely be provided by a carrier on a private lease lot if it was necessary to support operations. In the event that a carrier or the city undertook the construction of a terminal facility, it would probably include sufficient space for temporary cargo storage.

#### 6.4.6 Maintenance Buildings

ADOT&PF does not plan to construct a maintenance building at the Angoon Airport in the short term. It is assumed that all maintenance equipment (including a snowplow) would be housed at other ADOT&PF or City facilities off site until such time that operational demands required a facility at the airport.

#### 6.4.7 Aircraft Rescue and Fire Fighting (ARFF)

The operation of small aircraft as anticipated in the air traffic forecast does not require ARFF capability on the airport. Until that capability is required, all emergency response will be provided by the City of Angoon.

### **6.5 Total Area**

Using the information set forth in this chapter as well as the Airport Layout Plan, a minimum of 269.8 acres of land will be needed to accommodate a new airport to serve Angoon.

## **7.0 AIRPORT LAYOUT PLAN**

A sheet index and 11 sheets following depict the Angoon Airport Layout Plan

Sheet 1 of 11	Title Sheet
Sheet 2 of 11	Airport Layout Plan
Sheet 3 of 11	FAR Part 77 Airspace Plan: Runway 3-21 – Opening Day
Sheet 4 of 11	FAR Part 77 Airspace Plan: Runway 3 – Future
Sheet 5 of 11	FAR Part 77 Airspace Plan: Outer Approach, Runway 3-Future
Sheet 6 of 11	Inner Runway Approach Surfaces: Runway 3-21
Sheet 7 of 11	Terminal Area Plan
Sheet 8 of 11	Land Use/Property & Occupancy Plan
Sheet 9 of 11	Wetland Plan
Sheet 10 of 11	Airport Property Map (Exhibit ‘A’)
Sheet 11 of 11	Narrative Report

## **8.0 PUBLIC INVOLVEMENT**

Public outreach efforts completed as part of *Angoon Airport Master Plan* included:

1. Prepared and distributed a project newsletter in November 2004 to inform residents and those on project mailing list about the results of the Reconnaissance Study and about brushing and surveying of tow possible runaway centerlines.
2. Advertised and hosted a Public Information Meeting in Angoon in July 2005 to introduce the Airport Master Plan project, describe ongoing environmental field studies, and answer questions about the project. Display ads for the meeting were posted in the Capital City Weekly and Juneau Empire, flyers were posted in Angoon. Postcards were sent to agencies and the project mailing list.
3. Advertised and hosted a Public Meeting in Angoon in June 2006 coincident with release of the public review draft Angoon Airport Master Plan. Purpose of the meeting was to present the plan and answer questions to assist individuals who may wish to submit comments on the draft. Display ads for the meeting were posted in the Capital City Weekly and Juneau Empire, flyers were posted in Angoon. Post cards were sent to agencies and the project mailing list.
4. Issuance of the Angoon Airport Master Plan, and Background Report, in August 2006.